CONGRATULATIONS CLASS OF 2013!

MIT's Oldest and Largest Newspaper

tech.mit.edu

The Tech

Established 1881

WEATHER, p. 2
FRI: 62°F | 56°F Heavy rain
SAT: 69°F | 60°F Morning rain
SUN: 76°F | 60°F Partly sunny

Volume 133, Number 27

Friday, June 7, 2013

Drew Houston speaks at 147th Commencement

Dropbox founder — youngest Commencement speaker to date — delivers keynote address

ARTHUR PETRON—THE TECH

Ásbjörg Kristinsdóttir, PhD candidate in the Department of Civil and Environmental Engineering, receives her doctoral hood from Chancellor Eric Grimson PhD '80 and department head Andrew Whittle ScD '87 in Rockwell Cage Thursday.

By Jessica J. Pourian
CONTRIBUTING EDITOR

Over 2,600 students will graduate from MIT today, receiving over 3,300 degrees. Killian Court is expected to be filled with over 13,000 guests at the Institute's 147th Commencement.

MIT will award 1,042 bachelor's degrees, 1,749 master's, 11 engineer degrees, and 587 doctoral degrees, according to Registrar Mary Callahan. (September and February degrees are included in this count as well.) 977 undergraduates and 1,658 graduate students will walk in today's Commencement exercises, while PhD students were hooded at yesterday's doctoral hooding ceremony in Rockwell Cage.

The Graduating Student Survey, conducted annually by MIT's office of Global Education and Career Development (GECD), found that 37 percent of the undergraduate Class of 2013 will be continuing on to graduate school, while 56 percent will be entering the workforce. 2 percent have enrolled in another education program, another 2 percent are undecided, and the final one percent is doing another activity, according to Deborah L. Liverman, the director of career services. Of those planning to work, 95 percent will be in the US — the most popular states for employment are Massachusetts (29 percent), California (26 percent), and New York (14 percent). 52 percent of the undergraduate class responded to the survey as of June 4 at 9 a.m.

Keynote speaker

Today's keynote speaker will be Drew W. Houston '05 (pronounced "house-ton," unlike the city in Texas), the founder of the popular online file storage service Dropbox. Houston, 29, will be the youngest MIT commencement speaker in at least 30 years — beating out last year's speaker, Sal Khan '98, who was 35 at the time. Houston is the age of some of the graduates today!

Houston graduated from MIT

Commencement, Page 8

One year, 27 schools, 1 million enrollments

EdX sees new schools, classes, & design

By Kath Xu
ASSOCIATE NEWS EDITOR

It's been a little more than a year since edX, the nonprofit online learning enterprise founded by MIT and Harvard, first launched with much fanfare and a lot of press. Now, the enterprise encompasses 27 schools from 11 countries. In the past two weeks alone, edX has added more than half of those schools. At the same time, edX has completely overhauled its website design with the intentions of making it more colorful, sleek, and ultimately more appealing to the world. Finally, last Saturday, edX released its entire source code with the hopes of making the learning platform an open source project to which the community can contribute.

New schools, new courses, new design

The 15 additional schools who have now partnered with edX

EdX, Page 14

Swartz evidence to be released

Redacted documents to be made public within 88 days

By Joanna Kao
CONTRIBUTING EDITOR

The 88-day process to make evidence in the Swartz trial public has begun. The government, Aaron Swartz's lawyers, MIT, and JSTOR submitted a plan last Friday to release certain documents, but identifying information about MIT employees will be scrubbed, among other redactions. The plan was endorsed on Monday by U.S. District Judge Nathaniel M. Gorton.

Swartz's lawyers will have to turn over the evidence they collected for the trial to the Attorney's office by Monday, and the other parties will have 60 days to make the appropriate redactions. Swartz's lawyers will have 14 days to review the redactions, and all parties will have seven days to settle any disputes. If there are no extensions, the entire process will take a total of 88 days.

Swartz was federally indicted in July 2011 for downloading 4.8 million documents from JSTOR using MIT's resources (by leaving a laptop in a wiring closet in the basement of building 16 that was downloading articles using MIT's network) with the intent of distributing them. Swartz was also indicted by the Middlesex Superior Court in November 2011, but those charges were dropped in March 2012. In September 2012, the federal indictment was revised from four counts to thirteen counts against Swartz. Swartz pleaded not guilty to all 13 counts.

Because of the sensitive nature of the case, the court placed the documents collected in preparation for the trial under a protective order in November 2011, meaning that those documents would not be made available to the public.

The case was dismissed after

Swartz, Page 17

Eastgate evacuated due to penthouse stove fire

SidPac by day, Hyatt for some at night

By Joanna Kao
CONTRIBUTING EDITOR

Residents in MIT's Eastgate graduate dorm were forced to evacuate their building on Saturday when a stovetop fire broke out at 1:35 p.m. in the penthouse kitchen on the 29th floor, which is open to all residents. Residents were transported by bus to Sidney-Pacific, where food, childcare, and air conditioning (the temperature was over 92 degrees Saturday afternoon) was available. Most residents were allowed back into the building at 8:30 p.m. (around seven hours after the fire), but MIT had to put up a few residents in the Hyatt overnight. Since this event occurred the week before graduation and summer classes begin on Monday, some residents had moved in just days before the fire.

When the fire broke out, the sprinklers and smoke detectors in the kitchen went off at the same time — no one had pulled a fire alarm. The water from the sprinklers got into the elevators, stairwells, and the hallway on the 27th floor. Water also intruded into three apartments on the 28th floor, including the housemasters' apartment.

In the hours following the fire,

Eastgate, Page 13

JESSICA L. WASS—THE TECH

Architect Alan Joslin '77 holds up concept art as he explains what Phi Beta Epsilon will look like once construction is finished. The $7.2 million project includes building a new tower on the Amherst Alley side of the house, as well as a complete renovation of the existing interior and roof deck.

IN SHORT

The next Dean of Undergraduate Education will be professor of electrical engineering Dennis Freeman, succeeding Daniel Hastings.

For more Commencement information, visit *http://web.mit.edu/commencement/*.

MIT is collecting ideas for a permanent memorial for Officer Sean Collier. Email suggestions to *ideasformemorial@mit.edu* by June 30.

LaVerdes is on summer hours and will be open from 7 a.m. to 11 p.m.

Saferide hours have changed for summer. Check *http://web.mit.edu/facilities/transportation/shuttles/schedules/Saferide_holiday-2012.pdf* for more information.

Send news information and tips to *news@tech.mit.edu.*

DRUNK OFF THE FIREHOSE AT MIT

MIT has produced many successful graduates — but how can it improve? **OPINION, p. 4**

THE HIGHEST COMPENSATED

Who are MIT's highest compensated employees of 2011? **NEWS, p. 18**

MITWE, VIDEO, AND SHARIFI

Partnering for PBS documentary on the Arab Spring: *Awakening*. **ARTS, p. 9**

MIT: LAND OF THE NERDS AND GEEKS?

Missed *The Tech*'s fandom special in the last issue? Check it out at *http://bit.ly/mitfandom*.

MIURA DIES IN TRAFFIC ACCIDENT

CSAIL visiting scientist Kanako Miura passed away May 19 after an accident. **NEWS, p. 13**

SECTIONS

World & Nation . . . 2
Opinion 4
Campus Life 6
Fun Page 7
Arts 9
Sports 19

IMF concedes major missteps in bailout of Greece

WASHINGTON — The International Monetary Fund released an internal report Wednesday that sharply criticizes its first bailout program for Greece, the latest in a series of partial mea culpas as the fund reassesses the austerity that it has insisted on for ailing, debt-plagued economies.

The 50-page report, titled "Greece: Ex Post Evaluation of Exceptional Access Under the 2010 Stand-By Arrangement," acknowledges major mistakes in Greece's first bailout, which totaled about $143 billion and came into effect in 2010. The fund bent or broke three out of four of its own rules with the lending program, the report concludes. It also seriously underestimated the severity of Greece's downturn.

The first bailout failed to set Greece on a sustainable path. "Market confidence was not restored, the banking system lost 30 percent of its deposits, and the economy encountered a much deeper-than-expected recession with exceptionally high unemployment," the report said.

In 2012, the IMF and its partners, the European Commission and the European Central Bank, agreed to a bigger second program, totaling about $170 billion and requiring Greece's private sector bondholders to accept losses of at least 50 percent. The Greek economy has been shrinking for six consecutive years, with no end in sight, erasing a full decade of growth. The unemployment rate has hit 27 percent.

The report said that the fund miscalculated the so-called multiplier, or the effect that adding or subtracting a dollar of government spending would have on the broader economy during the downturn. It underestimated the scale of what has proved to be a devastating Greek depression, fueled in part by sharp government spending cuts and tax increases.

The initial program for Greece was "necessary" and "appropriate," the report concludes. But it also bent the IMF's own rules for lending to bankrupt countries.

In particular, the fund's experts were "unable to vouch" that Greece would be able to repay its loans in the medium term. "Staff favored going ahead with exceptional access because of the fear that spillovers from Greece would threaten the euro area and the global economy," the report said.

The IMF released the document after *The Wall Street Journal* reported some of its conclusions online.

—Annie Lowrey, The New York Times

Abe describes strategy to free up Japan's economy

TOKYO — The fervor is fading.

Prime Minister Shinzo Abe on Wednesday rolled out the next phase of his aggressive strategy to kick-start Japan's economy, with plans to encourage foreign investment, nurture innovation and improve regulation. But almost immediately, a big question surfaced: Will they go far enough?

Since taking office in December, Abe has promised to fight deflation and spur growth, through a combination of aggressive monetary easing, public works spending and economic overhauls. The initial efforts of his program showed promise, helping to drive the stock market up 80 percent from late last year.

But enthusiasm has waned in the last two weeks, as investors wondered whether the efforts were sustainable. The latest proposal did little to quell the concerns. The Nikkei 225-share index ended the day down 3.8 percent, another rout in an extended correction for the market.

For the next wave of so-called Abenomics, the prime minister laid out a wide range of policies aimed largely at the corporate sector. He plans to introduce tax breaks to increase foreign direct investment. He also said he would remove cumbersome regulations, for example, in the medical industry, by removing a ban on sales of nonprescription drugs on the Internet. And he pledged to combine Japan's high-grade infrastructure and manufacturing prowess with the daring and creativity of a younger generation.

—Hiroko Tabuchi, The New York Times

In Syrian victory, Hezbollah risks a broader fight

By Anne Barnard
THE NEW YORK TIMES

BEIRUT — In the final days the outgunned Syrian rebels, deprived of reinforcements, ammunition and sleep, were surviving on olives and canned beans. They were hiding in the concrete shells of destroyed houses and underground tunnels near the besieged rebel stronghold of Qusair, unable to help their trapped colleagues and civilians dying of treatable wounds, as Syrian government forces and their Hezbollah allies from Lebanon assaulted the town by land and air.

By Wednesday morning, it was time to flee for the rebel fighters in Qusair, who had managed to repel the Syrian army for months but could not withstand the additional attacks from Hezbollah, the Lebanese Shiite Muslim organization whose leader, Hassan Nasrallah, has made common cause with President Bashar Assad of Syria in the two-year-old civil war.

In triumphal tones, the Syrian news media announced that Qusair had been seized, as rebels said they had withdrawn from most of the city but vowed to fight on. Syrian state media broadcast photographs of soldiers raising flags over wrecked buildings as the rebels fled, and the Syrian military was calling the victory a turning point.

But Assad was victorious not because his military alone had defeated the rebels. Rather, he appeared to owe the victory to Hezbollah, which provided the crucial infantry power in recent weeks. Hezbollah's role and the vengeful reactions of its critics have further intensified sectarian divisions in Syria and beyond its borders, creating new risks for both Assad and Nasrallah even in their moment of victory.

"We will not forget what Hassan Nasrallah did," said Abu Zaid, 40, a fighter from Qusair. "We will take revenge from him and his organization even after 100 years."

While taking Qusair could infuse Assad's forces with momentum and embolden him to push for more military advances — just as Russia and the United States are pressing the antagonists in the Syrian conflict to negotiate — the intervention by Hezbollah could reverberate for that organization, which historically has been revered in Syria for its opposition to Israel. Now, in the eyes of the Syrian insurgency and its sympathizers, Hezbollah has turned its guns on fellow Muslims and taken on the form of an occupying force.

Before and after the insurgency's defeat in Qusair, rebels and civilian opponents of Assad vented rage not only at him but also at his allies — particularly Iran and the well-trained Shiite Muslim fighters of Hezbollah, whom they largely blamed for the casualties they had suffered.

Many expressed bitterness toward Nasrallah, who had exhorted his followers to come to Assad's aid against what Nasrallah portrayed as a jihadist-Israeli conspiracy to topple Assad and subvert Hezbollah's ability to attack, or defend against, Israel.

Syrian Sunnis who live in the Qusair area, near the border with Lebanon, said they felt betrayed by Hezbollah, which they had once exalted because it had helped end Israel's long occupation of southern Lebanon in 2000.

US and Venezuelan diplomats agree to work toward talks

By William Neuman and Randal C. Archibold
THE NEW YORK TIMES

CARACAS, Venezuela — After months of tensions between the United States and Venezuela, Secretary of State John Kerry met on Wednesday with the Venezuelan foreign minister, Elías Jaua, in Antigua, Guatemala, and announced the start of talks aimed at improving relations between the two countries.

The overture came after another hopeful sign, Venezuela's release from jail and subsequent expulsion of an American documentary filmmaker who had been accused of seeking to undermine the government. The filmmaker, Tim Tracy, was put on a commercial flight to Miami on Wednesday morning.

"We agreed today, both of us, Venezuela and the United States, that we would like to see our countries find a new way forward, establish a more constructive and positive relationship," Kerry said after meeting with Jaua on the sideline of a session of the General Assembly of the Organization of American States. U.S. officials said Venezuela had requested the meeting.

Appearing separately, Jaua said, "We have faith and confidence that this meeting marks the start of a relationship of respect."

The two men were photographed shaking hands in what a senior Obama administration official said appeared to be the first public meeting of top officials from the two countries since President Barack Obama and the Venezuelan president at the time, Hugo Chávez, shook hands in a brief encounter at a regional summit meeting in 2009.

Kerry said the countries had agreed "that there will be an ongoing and continuing dialogue at a high level" between the State Department and the Venezuelan Foreign Ministry.

He expressed hope that the countries could "quickly move to the appointment of ambassadors." Chávez expelled the American ambassador in 2008, accusing the United States of backing a group of military officers plotting a coup against him. In response, the United States expelled the Venezuelan ambassador.

The two countries quietly began similar talks aimed at improving relations late last year, but they ground to a halt a few weeks after Chávez, a socialist who often made the United States out to be a villain, flew to Cuba in early December for cancer surgery. Chávez died in March. In April, his handpicked successor, Nicolás Maduro, narrowly won an election to replace him.

WEATHER

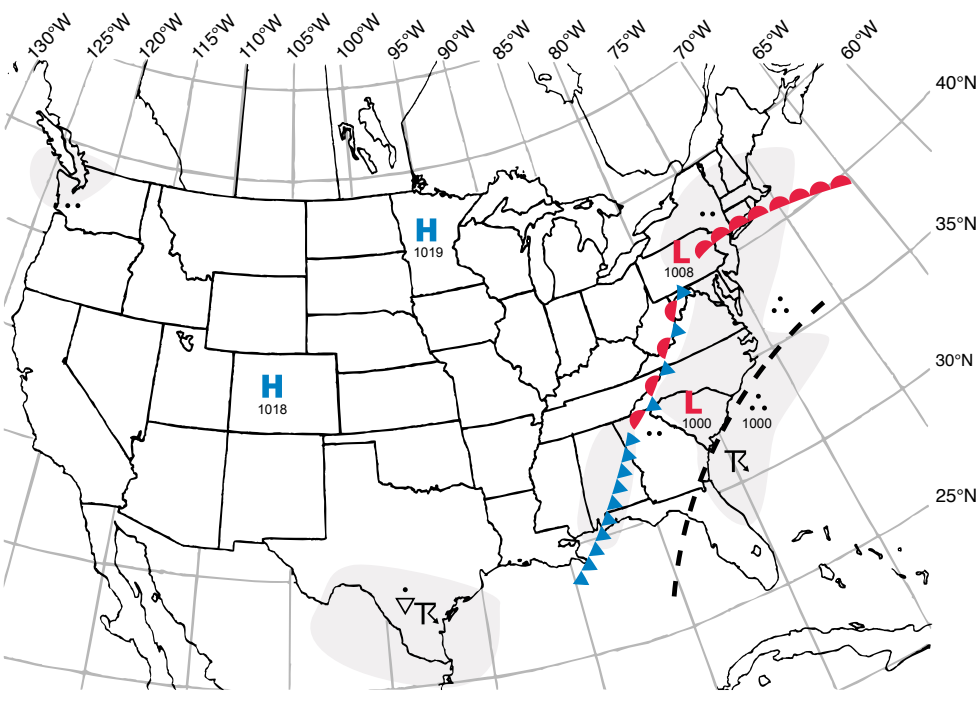
A rainy Commencement?

By Allison Wing
STAFF METEOROLOGIST

A rather complicated forecast situation has set up for Friday. While we all had hoped that the high pressure (which brought us gorgeous weather on Tuesday and Wednesday) would stick around for Commencement, Mother Nature has other plans in mind. A low pressure system moving from the Ohio River Valley into our regions brings the first threat of rain today. Complicating this though, is a tropical system, which as of 6 p.m. Wednesday was classified as the first tropical storm of the 2013 Atlantic hurricane season; Tropical Storm Andrea. This system will interact with the low pressure from the Ohio River Valley as well as with an upper level trough to bring heavy rain today and tomorrow. With abundant tropical moisture, we could receive several inches of rain. As of this writing, there is still significant forecast uncertainty regarding the track of this system, the timing of its arrival in the Northeast, and the location of the heaviest precipitation. It seems that the heaviest precipitation will not be until tonight, but there is, unfortunately, a chance of rain during this mornings Commencement ceremony. As the system heads out to sea tomorrow, the rain should taper, with dry weather expected on Sunday.

Extended Forecast

Today: Rain, heavy at times. High 62°F (17°C). East wind 10–15 mph.
Tonight: Heavy rain. Low 56°F (13°C). Northeast winds 6–10 mph.
Saturday: Rain, mostly in the morning. High 69°F (21°C). Low 60°F (16°C).
Sunday: Partly sunny. High 76°F (24°C). Low 60°F (16°C).



Situation for Noon Eastern Time, Friday, June 7, 2013

Weather Systems	Weather Fronts	Precipitation Symbols	Other Symbols
H High Pressure	Trough	Snow / Rain	Fog
L Low Pressure	Warm Front	Showers	Thunderstorm
§ Hurricane	Cold Front	Light	Haze
	Stationary Front	Moderate	Compiled by MIT Meteorology Staff and *The Tech*
		Heavy	

CLOSEST FULL SERVICE SHIPPING TO CAMPUS

Storage Available!

Get **FREE** pick up and **FREE** boxes with storage!

Visit our website for details and coupons:

www.theupsstorelocal.com/0681

2011 & 2012
UPS Store of the Year

THE UPS STORE
955 Massachusetts Avenue
617-868-5055
store0681@theupsstore.com

HOURS
Monday-Friday 8:30am-7:30pm
Saturday 9:00am-6:00pm
Sunday 10:00am-2:00pm (5/19, 5/26, 6/2)

Passport photos, copying, shredding, notary services, keys and mailboxes available

We'll ship your stuff home. (Even if home is halfway around the world.)

UPS™

The UPS Store™

Let our packaging experts handle your international shipping needs.

- A range of international services—from standard to next-day
- Proper handling of paperwork—to help your package clear customs faster
- Online tracking available
- Plus all the resources and expertise of UPS®

We're located near campus. Stop in and ask for details.

Morgan Stanley

Congratulations to Our Incoming Analysts

Rachel Bowman
Global Capital Markets, New York

James Burke
Fixed Income, New York

Katherine Fang
Investment Banking, New York

Yida Gao
Investment Banking, New York

Lauren Grieco
Technology & Data, New York

Diana Hsieh
Investment Banking, New York

Terence Hsu
Fixed Income, New York

Tong Li
Fixed Income, Hong Kong

Sunny Long
Institutional Equity, Hong Kong

Fred Wang
Credit Risk, Hong Kong

Alicia Xiong
Investment Banking, New York

Yiliu Zhang
Public Finance, New York

Morgan Stanley's mission is to build a community of talent that can deliver the finest financial thinking, products and execution in the world. Our people come from a variety of backgrounds and interests—all are high achievers who share integrity, intellectual curiosity and the desire to work in a collegial atmosphere. We give our people responsibility early, so they can soon make an impact on our business and the world at large.

© 2013 Morgan Stanley

OPINION OPINION OPINION

The Tech
Established 1881

Chairman
Sarah Ritter '14
Editor in Chief
Anne Cai '14
Business Manager
Joyce Zhang '16
Managing Editor
Ian M. Gorodisher '15
Executive Editor
Deborah Chen '14

NEWS STAFF

News Editors: Stan Gill '14, Bruno B.F. Faviero '15, Austin Hess '15; **Associate News Editors:** Stephanie Holden '14, Leo Zhou '14, Jaya Narain '15, Leon Lin '16, Kath Xu '16; **Staff:** Sara Hess G, Isabella Wei '14, Adisa Kruayatidee '15, Janelle Mansfield '15, Tushar Kamath '16; **Meteorologists:** Allison A. Wing G, Vince Agard '11, Roman Kowch '12, Shaena Berlin '13.

PRODUCTION STAFF

Editors: Annia Pan '15, Anthony Yu '16; **Associate Editor:** Judy Hsiang '12; **Staff:** Fareeha Safir '13, Esme Rhine '15, Will Conway '16.

OPINION STAFF

Editors: Andy Liang '14, Jacob London '15; **Staff:** Florence Gallez G, Keith A. Yost '08, Rachel C. Bandler '13, Ryan Normandin '13, A.J. Edelman '14, Kristian Fennessy '14, Sam Shames '14, Mike Veldman '14, Haldun Anil '15, Feras Saad '15.

SPORTS STAFF

Editors: Sarah Weir '14, Austin Osborne '15; **Associate Editor:** Katie Bodner '15; **Staff:** Michael Gerhardt '12, Zach Hynes '12, Nicholas Myers '12, Carlos Greaves '13, Russell Spivak '13, Nidharshan Anandasivam '14, Shri Ganeshram '15, Felicia Hsu '15, Nick Lopez '15.

ARTS STAFF

Editors: Angelique Nehmzow '14, Grace Young '14; **Staff:** Bogdan Fedeles G, Edwina Portocarrero G, Roberto Perez-Franco PhD '10, Jaimie Chung '13, Yü Linlin Huang '13, Emily Nardoni '13, Jenny Xie '13, Sophie H. Chung '14, Alex McCarthy '14, Natthida Wiwatwicha '14, Carolyn Zhang '14, Denis Bozic '15.

PHOTOGRAPHY STAFF

Editors: Jessica L. Wass '14, Tami Forrester '15, Christopher A. Maynor '15; **Staff:** Ekaterina Botchkina G, Kailiang Chen G, David Da He G, Arthur Petron G, Melissa Renée Schumacher G, Manohar Srikanth G, Scott Johnston '03, William Yee '10, Nicholas Chornay '12, Meng Heng Touch '12, Ho Yin Au '13, Akimitsu Hogge '13, Tiffany Ira Huang '13, Jaswanth Madhavan '13, Vanessa Trevino '13, Vivek Dasari '14, Jennifer Wang '14, Priya Garg '15, Jared L. Wong '15, Emily Kellison-Linn '16, Andrew Swayze.

CAMPUS LIFE STAFF

Editor: Kali Xu '15; **Associate Editor:** Deena Wang '14; **Staff:** Stephanie Lam G, Emily A. Moberg G, Paul Woods '13, Jacqueline Durazo '14, Mark Salmon '14; **Cartoonists:** Joshua Meisel G, Ranbel Sun G, Irving E. Wang G, Elise Stave '13, Amanda Aparicio '14, Ramya Swamy '14, Paelle Powell '15, Stephanie Su '15, Steve Sullivan '15, Timothy Yang '15, Dohyun Lee '16.

COPY STAFF

Copy Chief: Laura E. Forte '15; **Associate Copy Chief:** Madeline J. O'Grady '16; **Staff:** Jacob Austin-Breneman '13, Sylvan Tsai '15, Aidan Bevacqua '16, Gustavo H. Braga '16, Christina Curlette '16, Jake H. Gunter '16, Julia M. Longmate '16, Alyssa Napier '16.

BUSINESS STAFF

Advertising Managers: Moya Chin '13, Nayeon Kim '16; **Operations Manager:** Ding Ma '16; **Staff:** Joseph Maurer '12, Wendy Cheng '13, Jennifer Fong '13, Allison M. Lee '13, Arturo Gonzalez '14, Sarine Shahmirian '14, Rachel Agyemang '16, Maria I. Fabre E. '16, Marie E. Moudio '16.

TECHNOLOGY STAFF

Director: Greg Steinbrecher G; **Staff:** John A. Hawkinson '98, Kiran Bhattaram '13, Maja R. Rudolph '13, Alex Chernyakhovsky '14, Emad William '15, Alexander C. Bost.

ONLINE MEDIA STAFF

Editors: Lourdes D. Bobbio '15, Stephen Suen '15; **Staff:** Aaron L. Scheinberg G, David J. Bermejo '13, Aakanksha Sarda '14, Clara Liu '15, Vivian Liu '15, Mario Martínez '15, Jake Barnwell '16, Sarah Coe '16, Emilio Pace '16.

EDITORS AT LARGE

Contributing Editors: Joanna Kao '13, Connor Kirschbaum '13, Jessica J. Pourian '13, Michelle E. Szucs '14; **Senior Editors:** Shelley Ackerman '13, Kathryn Dere '13, Elijah Mena '13, Aislyn Schalck '13, Derek Chang '14.

ADVISORY BOARD

Paul E. Schindler, Jr. '74, V. Michael Bove '83, Barry S. Surman '84, Deborah A. Levinson '91, Jonathan E.D. Richmond PhD '91, Karen Kaplan '93, Saul Blumenthal '98, Frank Dabek '00, Satwiksai Seshasai '01, Daniel Ryan Bersak '02, Eric J. Cholankeril '02, Nathan Collins SM '03, Tiffany Dohzen '06, Beckett W. Sterner '06, Marissa Vogt '06, Andrew T. Lukmann '07, Zachary Ozer '07, Austin Chu '08, Michael McGraw-Herdeg '08, Omari Stephens '08, Marie Y. Thibault '08, Ricardo Ramirez '09, Nick Semenkovich '09, Angeline Wang '09, Quentin Smith '10, Jeff Guo '11, Ethan A. Solomon '12, B.D. Colen.

PRODUCTION STAFF FOR THIS ISSUE

Editors: Judy Hsiang '12, Annia Pan '15, Anthony Yu '16; **Staff:** Connor Kirschbaum '13; **Copy Editors:** Laura E. Forte '15.

The Tech (ISSN 0148-9607) is published on Tuesdays and Fridays during the academic year (except during MIT vacations), Wednesdays during January, and monthly during the summer by The Tech, Room W20-483, 84 Massachusetts Avenue, Cambridge, Mass. 02139. Subscriptions are $50.00 per year (third class). **POSTMASTER:** Please send all address changes to our mailing address: The Tech, P.O. Box 397029, Cambridge, Mass. 02139-7029. **TELEPHONE:** Editorial: (617) 253-1541. Business: (617) 258-8324. Facsimile: (617) 258-8226. *Advertising, subscription, and typesetting rates available.* Entire contents © ***2013 The Tech***. *Printed on recycled paper by Mass Web Printing Company.*

Drunk off the firehose: A review of MIT

Although it's successful, MIT could improve on education & culture

By Ryan Normandin
STAFF COLUMNIST

For the last four years, MIT has been my world. The Institute is a cruel and jealous master, demanding nothing less than complete devotion. It consumes you, and you become consumed by it.

Yet the payoff for one's time here is nothing less than grand; my four years have enhanced nearly every aspect of my person, making me smarter, more hard-working, and better at solving problems. I am more conscious of the complexity and nuances in the problems the world faces today. It's made me both more eager to tackle them and more capable of doing so.

Yet for all the praise that is heaped upon the Institute by its students, by its faculty, and by the rest of the world, there is still much work to be done. Is MIT one of the best at what it does? Absolutely. Can it do better? Significantly.

As a graduating senior, someone who has lived and breathed MIT for the last four years, I will attempt to comment on its model of education and its culture, the two aspects of the Institute that I have had the most intimate interaction with. While I do not have answers to all the questions I pose, I hope this piece will help frame discussions around some of the problems facing MIT.

The problem with lecture

MIT boasts world-class academics. It conducts cutting-edge research in nearly every technical field, its undergraduate students have unparalleled access to this research, and its graduates go on to incredible success. It is typically unquestioned that MIT's academics are exceptional; just look at its outputs!

Yet it is also no secret that MIT is incredibly selective. In March, it admitted only 8.2 percent of applicants to the Class of 2017. Thus, the students attending MIT really are really a select group of individuals; they are the ones who would excel regardless of the quality of academics. Indeed, many of these students have self-studied content without the help of any teacher. It is therefore difficult to attribute their success at and after MIT to the classes here.

How, then, can we ascertain the quality of MIT's model of education?

With the recent frenzy of education reform in America, there has been a significant amount of time and money dumped into trying to figure out the best ways to educate students. Unsurprisingly, it is generally agreed that hours of lecture is not the optimal method, and there is a strong push to make high school classes more interactive and dynamic.

> **My four years here have made me smarter, more hard-working, and better at solving problems.**

Why, then, does MIT continue to employ the standard lecture/recitation format? For those unfamiliar, most technical classes at MIT consist of two or three 60- to 90-minute lectures by the instructors, with one or two weekly 60-minute recitation sections. Particularly in the introductory classes, lectures are given to hundreds of students in halls. The recitation sections split the class into smaller groups of fifteen to thirty, conducted in various manners dependent on the instructor. Some recitations incorporate lots of student input, taking questions, working problems, and discussing solutions, while others are an extension of lecture.

How useful is this model of teaching, utilized in most other institution of higher education? Empirically, the number of students in almost every class I've attended wanes dramatically over the course of the semester. On the first day, finding a seat can be a challenge. On the last day, lecture halls are mostly empty seats.

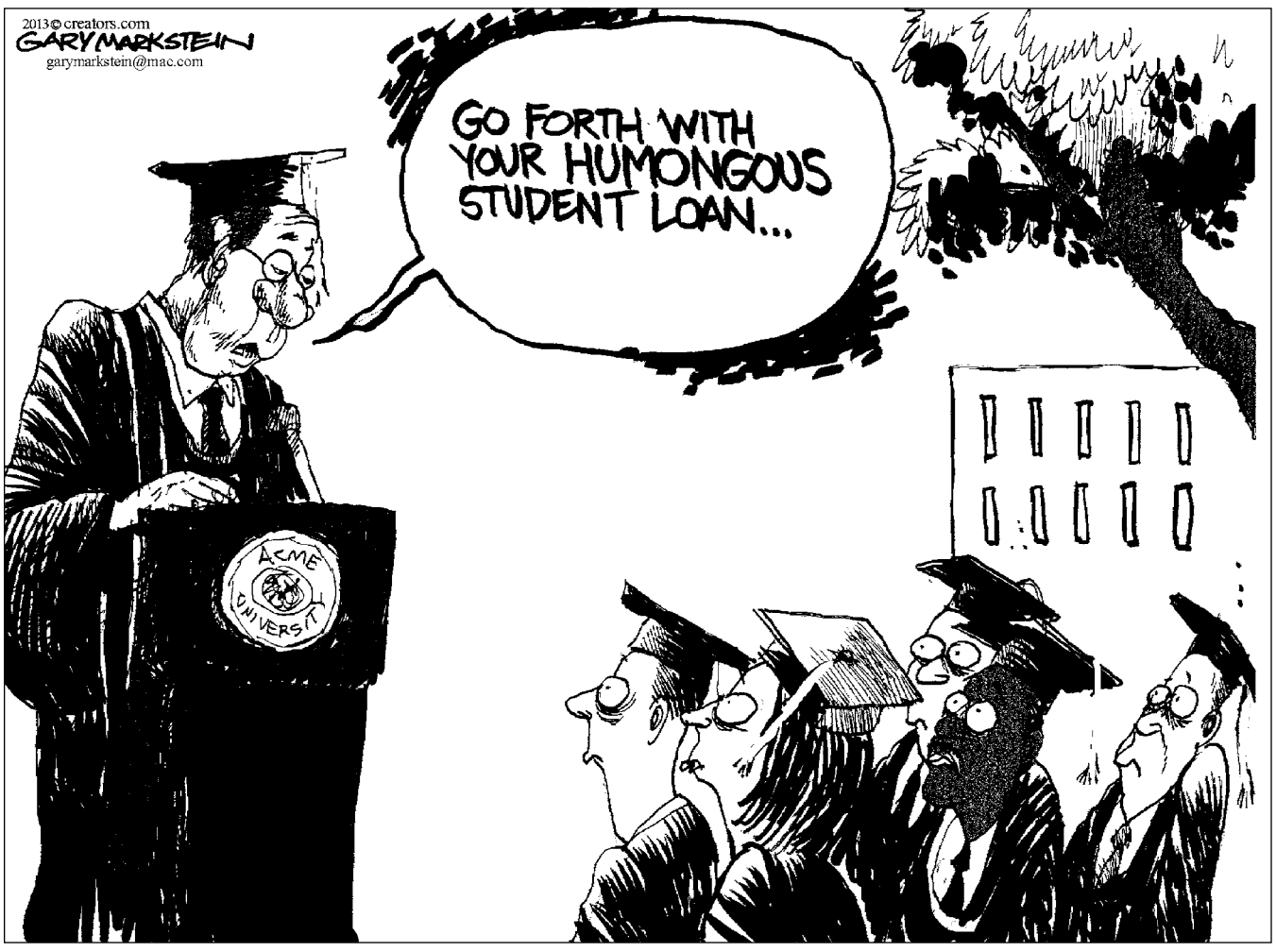
Is some of this due to students skipping lecture due to laziness, lack of sleep, or work overload? Sure. But with MIT having such an intense and driven culture, many students stop attending lecture because they have better things to do with their time.

During my years at MIT, I attended three or fewer lectures for under a fifth of my classes. This means I went in on the first day (maybe the second, to get a feel for the usefulness of the lecture) and decided that my time could be better spent otherwise. My average GPA in those classes is higher than my overall GPA. I also stopped attending lecture halfway through or later in more classes for the same reason, and I would have attended even fewer had attendance not been part of the grade for some.

Many lectures do not actually contribute to learning. At MIT, students learn the most by doing problem sets or working on projects. Any questions that are not clear can usually be clarified by friends in the class or by the professor during office hours.

Of course, while incredibly ineffective at teaching directly, this system makes MIT students excellent self-learners. A friend of mine from high school was once asked who his best football coach ever was. The student replied that his best coach was the

Normandin, Page 5



OPINION POLICY

Editorials are the official opinion of *The Tech*. They are written by the Editorial Board, which consists of Chairman Sarah Ritter, Editor in Chief Anne Cai, Managing Editor Ian M. Gorodisher, Executive Editor Deborah Chen, and Opinion Editor Jacob London.

Dissents are the signed opinions of editorial board members choosing to publish their disagreement with the editorial.

Letters to the editor, **columns**, and **editorial cartoons** are written by individuals and represent the opinion of the author, not necessarily that of the newspaper. Electronic submissions are encouraged and should be sent to *letters@tech.mit.edu*. Hard copy submissions should be addressed to *The Tech*, P.O. Box 397029, Cambridge, Mass. 02139-7029, or sent by interdepartmental mail to Room W20-483. All submissions are due by 4:30 p.m. two days before the date of publication.

Letters, columns, and cartoons must bear the authors' signatures, addresses, and phone numbers. Unsigned letters will not be accepted. *The Tech* reserves the right to edit or condense letters; shorter letters will be given higher priority. Once submitted, all letters become property of *The Tech*, and will not be returned. Letters, columns, and cartoons may also be posted on *The Tech*'s Web site and/or printed or published in any other format or medium now known or later that becomes known. *The Tech* makes no commitment to publish all the letters received.

Guest columns are opinion articles submitted by members of the MIT or local community.

TO REACH US

The Tech's telephone number is (617) 253-1541. Email is the easiest way to reach any member of our staff. If you are unsure whom to contact, send mail to *general@tech.mit.edu*, and it will be directed to the appropriate person. You can reach the editor in chief by emailing *eic@tech.mit.edu*. Please send press releases, requests for coverage, and information about errors that call for correction to *news@tech.mit.edu*. Letters to the editor should be sent to *letters@tech.mit.edu*. *The Tech* can be found on the World Wide Web at *http://tech.mit.edu*.

Reflecting on MIT's educational model and its culture

MIT is successful as an institution, but it should invest in a more interactive educational model

Normandin, from Page 4

laziest, most ineffective, hands-off coach he'd ever had. Because of the incredibly poor coach, the team was forced to step up, motivate themselves and each other, and figure out as a team how to win.

MIT, and most other colleges in the country, appear to be using this model. As such, much of the content that students learn at MIT, they teach themselves.

> **Of course, while incredibly ineffective at teaching directly, MIT's system makes its students excellent self-learners.**

When looking at why MIT utilizes this system, two reasons stand out. First, particularly in the required introductory classes, delivering content to 1500 students is most easily done through lecture. High school teachers struggle as class sizes grow beyond twenty or thirty; how can a large institution possibly deliver a targeted, personalized education to thousands? Second, there has been no impetus for change. MIT has churned out fantastic graduates for decades; why overturn a method of education delivery that has been, apparently, succeeding?

Technology-Enabled Active Learning (TEAL)

These questions have answers; indeed, MIT has already begun exploring a few. Freshman physics, both 8.01 (Mechanics) and 8.02 (Electricity and Magnetism) are taught in the TEAL (Technology-Enabled Active Learning) format instead of the traditional lecture-recitation format. Not only has TEAL lowered the fail rates, but according to 8.02 professor John Belcher in a 2003 Faculty Newsletter, TEAL has doubled the learning gains of students as compared to lecture.

In TEAL, students are seated at round tables in groups of nine, split into subgroups of three. The classrooms are covered in whiteboards and equipped with projector screens. Each table has three computers, and students use clickers to allow the professors to garner real-time feedback of student understanding of conceptual problems. Students are also periodically instructed to work together to solve problems, which they work out at the whiteboard. While professors still deliver lectures, the lectures are peppered with visualizations and experiments that students can do at their table. Undergraduate and graduate teaching assistants float about the room, each covering two or three tables to take questions. Essentially, class time contributed to learning because students are forced to become active participants.

When I interviewed Prof. Peter Dourmashkin, one of the pioneers of TEAL a few years ago, he said that TEAL "... is more about learning the information instead of just distributing it." It is this fundamental difference between TEAL and lectures that needs to be targeted.

Is TEAL perfect? Of course not. As an 8.02 TA, I picked up on a number of aspects that could be improved. First, the undergraduate teaching assistants should be better utilized. Ideally, each table would have its own TA, getting to know the students and helping them. The TAs should be better prepared for class to better help their assigned students. The lecture slides should be updated regularly to avoid confusion (the current set has not been completely redone in years).

And recitations should be more like problem-solving sessions. TEAL, like lecture, discourages questions because of the volume of students, leading to weaker personal interaction with the instructor and the fear of "looking stupid." A recitation section run by TAs would be a valuable tool in addressing student questions. Although some students proclaim to dislike TEAL, end-of-term surveys show the same levels of satisfaction as with the previous lecture format.

The possibilities of edX

The disadvantage to an expansion of TEAL is the cost. Hiring more TAs, creating more TEAL classrooms, and finding the time to develop TEAL curricula is a drain on resources. Of course, MIT is in a unique position to expand TEAL because it has access to such vast resources. Yet TEAL does not have to be the lone approach to solving the problem of MIT's outdated educational method. The dawn of edX provides a unique opportunity to the MIT community. Contrary to fears of devaluing MIT degrees, edX, if used properly, could enhance MIT's education system in an unprecedented way.

Imagine a class where students are given a list of online video lectures that they can watch, fast forward, rewind, and otherwise focus to really target what they understand and don't. This would be done outside of class, leaving all the time currently spent on lecture to be used on active learning. Students could have interactive recitation sections where they are able to ask questions and work problems in groups. They could have TEAL-like sections where the professor tests their understanding of concepts via clickers. Classes that currently don't have space for them could add lab sections, giving students hands-on understanding of the content. The possibilities associated with incorporating edX into MIT curricula are limited only by the creativity of the people here.

MIT should spearhead the innovation of these new active learning tools, and these changes should be implemented at every school that still uses the lecture/recitation format.

The contributions of culture

I mentioned earlier that much of the content learned at MIT is self-taught — but much of the deeper understanding is acquired through interacting with classmates. MIT's culture is unlike anything I have ever been exposed to. Being surrounded by brilliant, curious people who aren't afraid to ask the big questions and tackle the big problems is enriching beyond imagination.

It's no secret that MIT students don't sleep much. Perhaps less well-known is that much of this sleep deprivation is voluntary. I cannot count the number of times I sacrificed precious hours of sleep just to talk with the people I live with, and I don't regret a single moment of it. Debating presidential politics, solutions to global warming, and whether we'd rather fight an ostrich or a coyote to the death opened my eyes to other viewpoints and shaped the way I think more than anything else at MIT. Whenever I speak to prospective students, I always tell them the real reason to come to MIT is the students.

And the students help each other with such enthusiasm. I expected MIT to be hyper-competitive: how could it not be with such a group of overachievers? Surprisingly, I discovered the Institute is the most collaborative environment I've ever worked in. There is a great sense of everyone being in it together — I suppose mutual suffering, sleep deprivation, and failure create a special kind of bond.

For all the great things one can say about the culture, there are aspects of it which are unfortunate, but perhaps necessary byproducts of such an excellence-driven community. Since arriving at MIT, I have not read a single book for pleasure. I have not done physics or math for fun. I have not contributed to campus life or causes as much as I would have liked.

MIT has drained from me all the things that I used to love and do for fun. In some cases, it even drains the enthusiasm I have for my major. On the occasions when students are not working or doing activities with clubs or campus groups, they often prefer to relax with friends because they are too exhausted to do anything else.

Part of the problem is the pervasive feeling of, to varying extents, guilt when not working. When students take a break or finish a pset, there is always a nagging in the back of their mind that they have more assignments. The severity ranges from quiet lurking to full-fledged guilt at not working hard enough.

The "drinking from the firehose" metaphor is rather apt — the work and expectations at MIT feel very much like a flood. They hit you hard, and no matter how much effort you put forth, you never really catch up completely.

> **The 'drinking from the firehose' metaphor is apt — the work and expectations at MIT feel very much like a flood. They hit you hard, and no matter how much effort you put forth, you never really catch up.**

Conclusions

And so, although there is a feeling of relief that comes with graduating MIT, the nostalgia is much stronger. MIT has given me so much through its professors, its students, and its opportunities, and I wish I could give back to others a fraction of that. It's sad to think that I will likely never again be so engrossed in a place that is so interesting, so curious, and so driven to change the world, but I know that I will hold dear in my memory and actions the time that I spent here.

Much of this article was spent on what can be improved, and indeed much can. MIT needs to completely overhaul its method of delivering education, and should continue to focus on mental health to patch up the less glamorous aspects of its culture. But as long as MIT continues to be the home to such passionate, motivated people, it will continue to change lives and change the world.

Thank you, MIT.

REFLECTIONS

MIT, in a box

As the memories and possessions accrued, MIT gradually became home

By Jessica J. Pourian
Contributing Editor

I arrived at the Institute in August of 2009 with two suitcases, a backpack, and a lot of enthusiasm. I was eager to begin my college life — to stay up absurdly late, make friends while psetting, have a swank dorm room, be independent etc. — and I had arrived at school early to participate in my Freshman Pre-Orientation Program (FPOP), the Freshman Arts Program.

After unpacking, I remember staring at my barren room and thinking it still looked sadly empty. Envious of the cozy appearance of the seniors' rooms on my hall, I spent much of my freshman year obsessively watching "reuse" (an email list dedicated to giving away free items) and creating what I thought was the perfect, homey room in my little single in East Campus.

During those first few months I was still baffled as to how I tricked admissions into letting me into the school in the first place. It was during that tender time that I joined *The Tech* and wrote my first article — a campus life column just like this one, but one comprised of my thoughts upon just coming to MIT as opposed to getting ready to leave it.

By that article's publication on September 4, 2009, I had already been stunned by MIT's diversity, impressed by the intelligence and creativity of its students, and experienced walking down the Infinite at the wee hours of the morning (something I have repeated over a thousand times since). I had just been through MIT's incredible REX, finished my FPOP, and met some of the finest individuals I had ever encountered, many of whom I will have the pleasure of calling friends for the rest of my life.

MIT isn't just for 'geniuses' or any of the other stereotypes we associate with our school. It's for all of us.

That column expressed my shock at how students just a few years older than me were capable of such cool inventions — from the East Campus rollercoaster to a variety of homebuilt Course 6 gadgets. And today, when I walk with this wonderful crowd into Killian Court, I continue to be shocked at the ingenuity of MIT students, though now the undergraduates are all my juniors.

Four years later, my homey room probably boasts more stuff than the average 25 year old's studio apartment. Like many of the others who will be sitting with me today, I was horrified at the collection of detritus that managed to accumulate in my room. After spending hours slogging through clutter in my room, I sent my final email to reuse, begging students to come claim things.

As I watched dozens of underclassmen come to cart away their new loot, I realized a couple of important things.

The first was that you probably shouldn't grab everything that looks appealing on reuse, because trying to move four years worth of junk is a nightmare. The second was that many of the items I had put outside were ones I had picked up from reuse, years ago, and they had slowly become my own through time.

In the fall of 2009, I wrote that MIT was "something for Nobel Laureates, audio company founders, renowned architects, and Iron Man. Not for me, someone who applied to MIT without any expectation of acceptance whatsoever." I lauded MIT as a supposed "school of geniuses," and though I did feel happy at the time, I was still beset by insecurity as a freshman and often felt I did not belong.

I was worried, but 8 semesters later I realize that MIT isn't just for "geniuses" or any of the other stereotypes we associate with our school. I first saw MIT as something foreign — something that wasn't for me — but the past four years have shown me otherwise. MIT is for me, it's for all of us. It's an incredibly special place where you can be surrounded by some of the most motivated and intelligent people on the planet, a place where you can learn from incredible faculty, and it's a place I will miss dearly.

I've had my late nights, completed all of my psets, and done all but 27 of the things listed in the 101 Things to Do Before You Graduate (a poster I discovered only after dumping about 50 pounds of paper from my desk). Today I have the honor of finishing one more of them, along with the rest of the Class of 2013.

To my friends and classmates, congratulations. We're done!

THE SECRET LIFE OF RESEARCHERS

Creating your own opportunities

A case study at the intersection of art and science

By Whitney Bernstein

Visit the Museum of Science, Boston this week. Proceed to the Blue wing up the escalators and to the left of the butterfly exhibit. There you will find Ocean Stories, an exhibit housed in the Art Science Gallery, a 2000-square-foot gallery twenty feet tall. By exploring Ocean Stories, you will discover oceanography translated through the prism of artwork.

In the center is a complex sculpture in the form of an amusement park. It consists of intricately woven reeds and rope laced with colored wood and paper. But the primary medium used here is actual data. Each component of the sculpture is based on real physical, chemical, and biological data collected in the Gulf of Maine. The Labrador Current is represented by a roller coaster curving over a hand crafted bathymetric map of Georges Bank and nearby coastal features. The merry-go-round shows how krill abundance relates to seasonal variations of air and water temperature, salinity, currents, wave height, and solar azimuth. The Ferris wheel shows the cycle of krill moving up and down in the water column in concert with the rise and fall of the sun. The Swing ride shows the tidal patterns of the Bay of Fundy. Artist Nathalie Miebach has essentially plotted data in a new grid space, creating a sculpture that affords the viewers with a new appreciation for the patterns found in the complexity of nature — the cycles and mechanisms that drive natural processes in the Gulf of Maine. This piece offers insight into how scientists and artists — both of which are researchers and careful observers in their own right — make sense of the complex world before them.

As you proceed from this sculpture to the abstract video art, etchings, poetry, photography, paintings, and wall sculptures throughout the gallery, you will encounter the physics of salty swirling whirlpools, the impacts of changing ocean chemistry, the mysteries of the deep ocean, and the rhythmic light patterns in Cape Cod eel grass beds. Also present in the artwork are various meditations on the process and practice of both art and science.

I believe that art is a tremendously powerful platform for communicating complex and expansive ideas in meaningful ways.

This exhibition sprang from collaborations between fine artists and MIT graduate students and is the first of several collaborative art science exhibits to be produced by Synergy, a new program that I founded last year with the help of MIT, Woods Hole Oceanographic Institution (WHOI), the Museum of Science, Brown University, and my co-producers Lizzie Kripke and Michael MacMahon.

I founded Synergy because I believe that art is a tremendously powerful platform for communicating complex and expansive ideas in meaningful ways. Not being an artist myself, I felt limited in my ability to communicate through art. I became interested in what would happen if fine artists were partnered with scientists. However, it was not clear exactly how I could get involved in the emerging art-science field. There are few opportunities for gaining professional experience at the intersection of art and science because the field is young in some respects. Instead, a colleague working at this intersection encouraged me to bypass the well-trodden internship model and boldly curate my own exhibition.

I submitted a proposal to the Council for the Arts at MIT and a second proposal to the Graduate Student Life Grants. With seed funding in hand, I worked with my co-producers to put out a call for artists using a variety of connections we made while networking in art-science circles. This resulted in a substantial applicant pool, from which we selected eight artists who we then matched with MIT and WHOI scientists through a mutually selective process much like speed dating. I set this collective of artists and scientists to the task of recasting and translating oceanographic research in artistic form.

The next step was to find a gallery for the show. I considered many options from a weekend show on campus, to a month-long show in a local art association. And then, through the terrific network of MIT, an opportunity arose to pitch the idea to the Museum of Science! Indeed, the rich array of resources, networks, and opportunities available at MIT are poised to support your most ambitious and unconventional ideas.

From that point onward the entire project took on a life of its own. As a result, I felt I was sometimes in over my head. But everyone rose to the occasion and the resources at MIT and WHOI continued to be tremendously supportive, providing us with a second round of funding. Lizzie and I knitted together the diverse contributions from the participating artists and scientists and from the exhibit team at the Museum of Science and realized our shared vision for the exhibit.

I suspect that at no other time in my life will I have so many terrific resources at my fingertips. MIT is a wonderful playing field for resourceful self-starters. I am inspired by my ambitious and proactive peers and feel supported by the institution. By identifying key resources and combining them in a creative way, I was able to create the opportunity and experience that I sought at the intersection of art and science.

MassWeb
PRINTING COMPANY INC.
WASHINGTON STREET
URN, MASSACHUSETTS 01501

CENTRAL MA 015

The Tech is financially independent from MIT.
Join the group that pays its own bills.
join-biz@tech.mit.edu

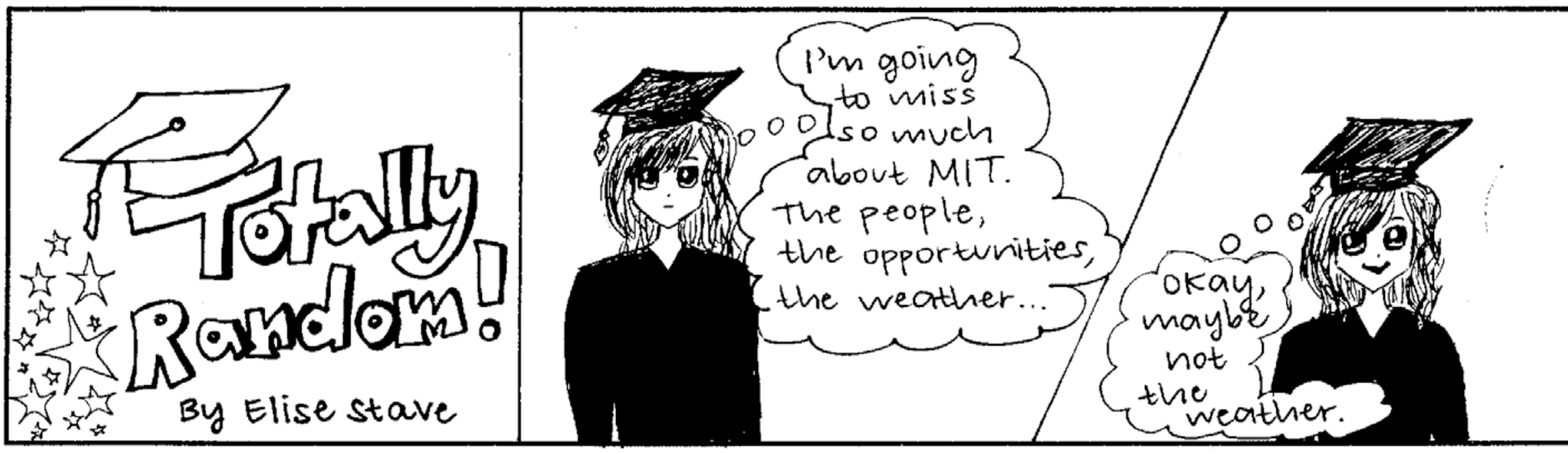
THE TECH
ATTN: ACCOUNTS PAYABLE
P.O. BOX 397029
CAMBRIDGE, MA 02139-7029

02139+7029

Boston Calling Music Festival

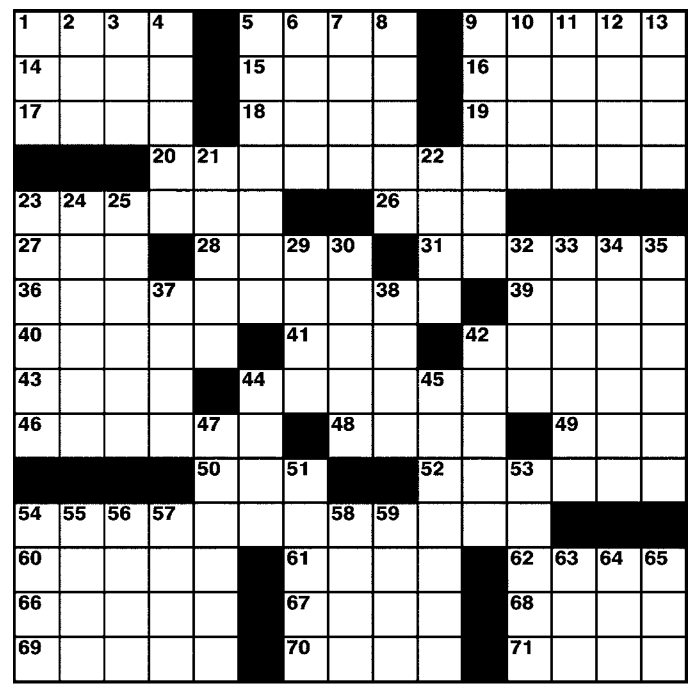
ORÇUN GÖGÜS

The National performing at the Boston Calling Music Festival. The festival took place Memorial Day Weekend, and the lineup featured The National in addition to FUN, Andrew Bird, Ra Ra Riot, Matt & Kim, and The Shins, among others. The festival returns Saturday and Sunday, Sept. 7 and 8 at City Hall Plaza in Boston.



Lawbreakers by Billie Truitt

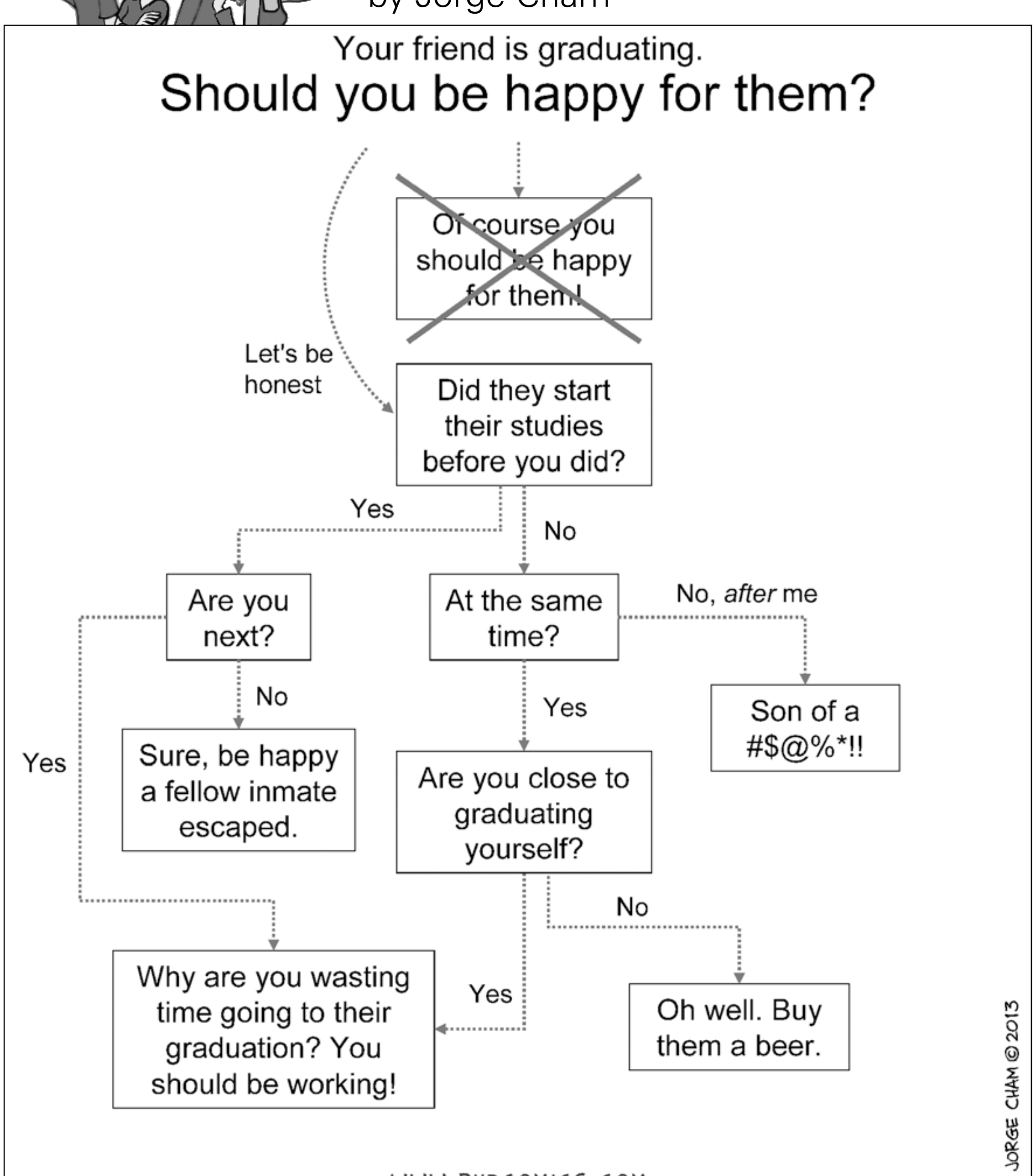
Solution, page 17



ACROSS
1 Shell game
5 Harmony, for short
9 Unfreezes
14 Scrubbed, at 7 Down
15 Listen to
16 Legendary storyteller
17 Heist haul
18 Not to mention
19 Santa __, CA
20 Prevaricate
23 Piece of parchment
26 Lake creator
27 "What have we here!"
28 Pack member
31 Sancho Panza's donkey
36 Washington city
39 Spot for a horseshoe
40 Parquetry design
41 Utter
42 __ circumstances (conditions)
43 Poetic adverb
44 Counting sheep, unfortunately
46 Whirl
48 Whirl
49 Caper investigator
50 Scenery chewer
52 Accompany
54 Save for later
60 Small portion
61 Family nickname
62 Catch red-handed
66 Waits
67 Done with
68 Sit in traffic
69 Smidgen
70 Gritty grains
71 Derby entrant

DOWN
1 NBC comedy series
2 Fond murmur
3 Back in time
4 Phrase on some samplers
5 Superficial
6 Cheerleader's cheer
7 Curiosity org.
8 Press together
9 City near Seattle
10 Pitch in
11 Letters of urgency
12 Put on
13 Bandy words
21 Hall of Fame Broncos quarterback
22 __ ball (enjoyed oneself)
23 Promulgating
24 Filmdom's first Phantom of the Opera
25 Hair accessory
29 Endure
30 Natural ability
32 "What a relief!"
33 Beef stew ingredient
34 Attractive one
35 Influence
37 Angelina film role
38 Singer Lovett
42 Zesty dip
44 Burn slightly
45 Nautical direction
47 Remove the chaff
51 In-box stack
53 Doubter
54 Sounds unhappy
55 Time-saving, in product names
56 Cancel out
57 Finishes, as a torte
58 Hot rock
59 "You said it!"
63 Hubbub
64 Not very well
65 Ending for book or brook

by Jorge Cham



Sudoku

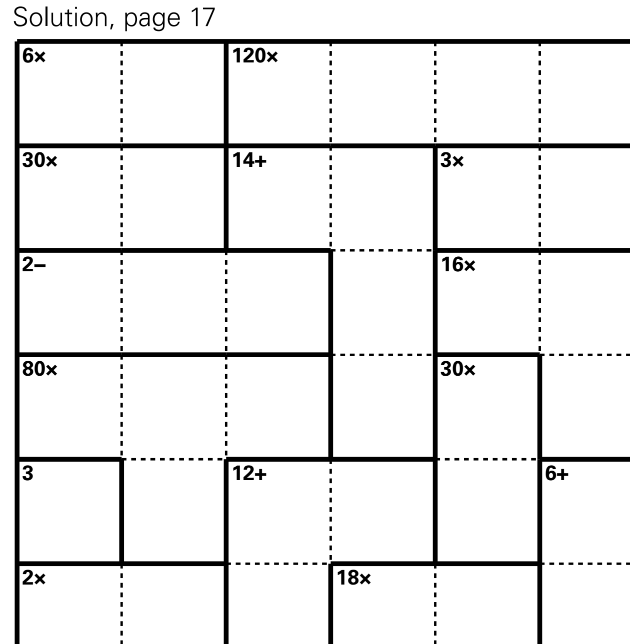
Solution, page 17

1		4			8			5
		9		5				1
		5		2	4	3		
	4				9			
		7	2		5	8		
			3				2	
		1	6	7		9		
6				8		7		
7			4			1		6

Instructions: Fill in the grid so that each column, row, and 3 by 3 grid contains exactly one of each of the digits 1 through 9.

Techdoku

Solution, page 17



Instructions: Fill in the grid so that each column and row contains exactly one of each of the numbers 1–6. Follow the mathematical operations for each box.

Houston possibly to give startup advice to seniors

Of graduating seniors going into workforce, most living in California & Massachusetts

Commencement, from Page 1

with a Bachelor of Science in Computer Science and Engineering (6-3) in 2005. He says that MIT's Athena system, which allows students to access their files from any computer on campus, served as an inspiration for Dropbox. He worked on the company with Arash Ferdowsi, an MIT student who left the Institute to work with him in 2007.

The two were successful — Dropbox appeared on the cover of *Forbes* magazine last year and today boasts over 100 million users.

In an interview with *The Tech* in October, Houston hinted that today's speech might include some tips for those students looking to found their own startups.

"Building Dropbox has been the most amazing experience of my life, and I'm really excited to share the experience and what I've learned in this whole journey," he said. "Starting a company is a very mysterious process."

Institute President L. Rafael Reif will deliver the traditional charge to the graduates.

Seniors

Undergraduate seniors spent their last few days at the Institute participating in a variety of Senior Week events hosted by the 2013 Senior Week Committee. The week kicked off with a champagne toast hosted by Chancellor Eric Grimson PhD '80 last Friday and included events like skydiving, kayaking, a club night, a dodgeball tournament, a Red Sox game, bowling, and laser tag.

Every year, the undergraduate senior class organizes a fundraiser to raise money for a particular cause. This year's class raised $30,000 to fund Mad Money grants for MIT students. Mad Money grants are meant to help fund student groups that need cash for things "beyond the scope of [their] annual budget for travel or special projects," according to the Senior Gift website.

The Class of 2013 set a record for class participation — 83 percent of the class donated to the cause, and alumnus George Dotson '62 pledged to match up to $25,000 of the senior class gift.

Upped security

This year's Commencement will feature some of the heaviest security since 2002 — the Commencement immediately following the 9/11 attacks.

All graduates and attendees will be required to pass through metal detectors at the entrance to Killian Court. No backpacks, large bags, or other large wrapped objects will be permitted during the ceremony. Bottles and other beverage containers are also prohibited. While diaper bags and purses are allowed, the MIT commencement website warns that all items taken to the court are subject to search. Electronics will require demonstration in order to be brought inside. Guests should bring government issued photo ID with them to the ceremony.

Commencement Schedule

The entrance to Killian Court opens at 7:30 a.m. today, though many families arrive earlier to be ready to grab prime seats. However, it's not necessary to arrive that early — the actual ceremony begins at 10 a.m. However, the gates do briefly close at 9:45 a.m. for the academic procession.

Those who do not have a view of the stage can sit next to the Jumbotron screen by the back right section of the audience. Tickets are required for all attendees over the age of three, and are required for re-entry into the court.

Though today's forecast calls for rain, families should note that umbrellas are not permitted in Killian Court. Guests who do not wish to sit outside can watch the ceremony from a variety of indoor locations that will have a live broadcast (see sidebar). It is only in case of severe weather — such as hurricanes or thunder storms — that the outdoor ceremony would be canceled.

The length of Commencement varies every year, but should end sometime between 1:15 and 1:30 p.m. The court will remain set up for a couple hours afterwards in order for graduates and their families to take photos. Immediately following the ceremony, departments hold individual receptions with food and refreshments. A list of receptions can be found in the sidebar.

More information about the commencement exercises can be found at *http://web.mit.edu/commencement/2013/index.html*.

Viewing Centers

A live stream of the Commencement exercises will be broadcast to the following classrooms. Each number represents a specific room on campus; the number before the hyphen is the building number, the numeral immediately after is the floor number, and the remaining numerals are the classroom number.

Locations are main or adjacent buildings surrounding Killian Court:

Building 1	Rooms 1-246, 1-273, 1-277, 1-371, 1-375, 1-379, 1-390
Building 2	Rooms 2-131, 2-132, 2-135, 2-136, 2-139, 2-142, 2-143, 2-146, 2-147, 2-151
Building 3	Rooms 3-270, 3-370
Building 4	Rooms 4-231, 4-237
Building 6	Room 6-120
Building 10	Room 10-250

Locations a short distance from Killian Court:

Building 26	Room 26-100
Building 34	Room 34-101
Building 56	Room 56-114

Locations nearby in the Stata Center:

Building 32	Rooms 32-123, 32-124, 32-141, 32-144, 32-155

These locations are on the east side of campus:

Building E51	Rooms E51-372, E51-376

From *http://web.mit.edu/commencement/2013/family/viewing-centers.html.*

Department Receptions

Receptions take place immediately after the ceremony unless otherwise noted.

School of Architecture and Planning
Building E14, Sixth Floor

School of Humanities, Arts, and Social Sciences
Tent on the North Court amid Buildings 32, 76, and 68

School of Engineering
Department of Aeronautics and Astronautics
Tent in front of Building 33
Department of Biological Engineering
Tent on Eastman Court between Buildings 6 and 14
Department of Chemical Engineering
Tent on McDermott Court between Buildings 18 and 62
Department of Civil and Environmental Engineering
Tent at BBQ area behind Kresge Auditorium, Building W16
Department of Electrical Engineering and Computer Science
Tent on the North Court amid Buildings 32, 76, and 68
Engineering Systems Division Doctoral Program
Building E40, Room 298, 1:30–4 p.m.
Department of Materials Science and Engineering
Tent on Eastman Court between Buildings 6 and 18
Department of Mechanical Engineering
Tent in front of Hayden Memorial Library, Building 14 (on Memorial Dr.)
Center for Transportation & Logistics, Supply Chain Management Program
Lipchitz Courtyard, inside Building 14

School of Science
Department of Biology
Magasanik Room, Building 68, Room 180
Department of Brain and Cognitive Sciences
Building 46, Third Floor Atrium
Department of Chemistry
Building 18 Lobby, 1:30–3:15 p.m.
Department of Earth, Atmospheric and Planetary Sciences
Ida Green Lounge, Building 54, Room 923
Department of Mathematics
Building 6C Atrium
Department of Physics
Pappalardo Room, Building 4, Room 349, 3–5 p.m.

Sloan School of Management
Building E62, First Floor Lobby
Operations Research Center
Building E40, Room 106
Sloan Fellows Program
MIT Faculty Club, Building E52, Sixth Floor
System Design and Management Program
The Liberty Hotel, 215 Charles St., Boston, 2–5 p.m.

Other Receptions
Concourse
Building 16, Room 128, 3–5 p.m.
Martin Trust Center for MIT Entrepreneurship
Building E40, Room 160, until 3 p.m.

CONGRATULATIONS

the Hertz FOUNDATION
freedom to innovate

The Fannie and John Hertz Foundation
is pleased to announce
Kathleen Alexander, Hilary Finucane,
James Pelletier, and **Jennifer Schloss,**
have received the
Hertz Foundation Graduate Fellowship Award for 2013

Ms. Alexander, Ms. Finucane, Mr. Pelletier, and Ms. Schloss
are four of 15 exceptionally talented and creative young innovators
to receive a
Graduate Fellowship Award of up to $250,000
in the Applied Physical, Biological, and Engineering Sciences

Kathleen Alexander
Materials Science

James Pelletier
Biophysics

Hilary Finucane
Computational Biology

Jennifer Schloss
Applied Physics
and Astronomy

The Hertz Foundation Fellowship · Commitment · Community · Innovation · 50 Hz

The Hertz Graduate Fellowship Celebrates 50 Years

Learn More or Apply for a 2014 Hertz Foundation Fellowship
www.HertzFoundation.org

COURTESY OF UNIVERSAL PICTURES

Tyrese Gibson as Roman makes a death-defying leap.

MOVIE REVIEW

Speed and fury at its finest

Fast & Furious 6 dazzles and entertains

By Bogdan Fedeles
STAFF WRITER

They're back! The star-studded cast of the venerable 12-year-old franchise, with its explosive combination of fast cars and furious drivers, returns to deliver another high-octane action thriller. Justin Lin is once again at the helm of the movie, continuing his stellar directing performance on the franchise. Lin was in fact instrumental in resurrecting and rebooting the series after the first few mediocre sequels.

Fast & Furious 6 delivers on all counts. For the diehard fans of the series, it brings together all the major characters from the previous films and contains numerous inside jokes and references to past storylines. However, the plot is straightforward enough that the movie is equally entertaining and satisfying for newbies as well. The action sets new records for intensity and spectacle. Aided by stunning visuals and bold cinematography, and featuring lots of sports cars and many other surprising vehicles, the car chases are so rich in adrenaline that they border on ludicrous, yet they still thoroughly satisfy. The thrill of the action is also magnified by contrasting static scenes that delve into character development, perhaps even more so than in the previous movies. While it's hard to be taken seriously in this genre, and scenes with unintentional humor still abound, the actors (especially Vin Diesel and Dwayne Johnson) deliver convincing performances that stretch beyond simple posturing. Finally, the movie makes excellent use of the comedic talents of Tyrese Gibson and Ludacris, keeping the dialogue snappy and the whole atmosphere light hearted.

The last Fast & Furious movie, *Fast Five*, had the protagonists scatter around the world to enjoy the fruits of their successful Rio heist, but unable to ever return home. When confronted with a new elite underground organization of car smugglers, CIA agent Hobbs (Dwayne Johnson) enlists Dom (Vin Diesel) and his team for help, in return for full pardons. Hesitant at first, Dom accepts the challenge when he finds out that his former flame Letty (Michelle Rodriguez), presumed dead, is in fact alive and among the leaders of the smugglers. At first, Dom's team finds itself at a disadvantage being significantly outclassed in the "vehicular warfare" category. Nevertheless, what starts out as a predictable, linear story quickly develops into a thrilling adventure full of suspense, and delightful twists and turns. Passion, betrayal, revenge, sacrifice — all are elements that fuel the dramatic buildup which culminates in the (literally) explosive finale.

As in with the other movies, the cars are the bread and butter of *Fast & Furious 6*. The dizzying variety in makes and models is part of the movie's appeal. We see run-of-the-mill BMW M5s juxtaposed to sexy sports cars (Nissan Skyline, Eagle Speedster Jaguar E-type, Lamborghini Murcielago, Lucra LC470) and a few American muscle cars (Dodge Charger, Ford Escort, Ford Mustang). The cars are also used effectively to describe the personality of their drivers, which is why every protagonist has a different car: Shaw (Luke Evans), the smooth villain boasts a Bond-style Aston Martin; Dom's ruggedness is embodied in his roaring Dodge Daytona; Letty whizzes by in a sleek Jensen Interceptor, while the hulking Hobbs drives around a Navistar MXT military jeep. In fact, the vitality of the people is further exemplified in the car crashes: unlike in real life, almost no car crash is fatal. Even more incredibly, breaking your fall onto a car (as opposed to onto a pavement) makes the difference between life and death. While the selective application of the laws of physics can be irritating, it does bestow a certain mystical aura upon the cars that the audience can easily relate to.

Fast & Furious 6 features more than just cars. Numerous other kinds of vehicles get chased and eventually smashed up. We also witness innovative uses of high-tensile titanium cable, and we learn how to neutralize a tank chasing you on a busy highway. With the right skill and some luck, even a massive Antonov cargo plane can be brought down using a few intrepid cars and drivers. Once again, the laws of motion and gravity are treated as optional guidelines, but the suspension of disbelief is fully achieved with spectacular special effects, aggressive camera angles and a highly-driven yet remarkably diverse soundtrack.

With all the elements of its established winning formula in place, and a few extra, the movie is a sure summer blockbuster. And if you feel you haven't gotten enough of the Fast & Furious, fret not. Midway through the credits, a new car chase unfolds introducing a pissed Jason Statham vowing revenge; which can only mean the seventh *Fast & Furious* movie is coming soon.

★★★★☆

Fast & Furious 6

Directed by Justin Lin

Starring Vin Diesel, Paul Walker, Dwayne Johnson, Jordana Brewster, and Michelle Rodriguez

GILES KEYTE

Dwayne Johnson as Hobbs in *Fast & Furious 6*.

CONCERT REVIEW

Evoking the Arab Spring through music

MITWE, MIT Video Productions, and Jamsheid Sharifi '83 partner for PBS documentary

By Grace Young
ARTS EDITOR

The MIT Wind Ensemble (MITWE) scored a coup last Friday when PBS aired the television world premiere of MIT-produced documentary *Awakening: Evoking the Arab Spring Through Music*. The documentary featured MITWE's performance of *Awakening*, composed by MIT alumnus Jamsheid Sharifi '83. The piece is intended to encourage listeners to contemplate the movement that swept Tunisia, Libya, Egypt, and other Arab countries. MITWE director Dr. Frederick Harris commissioned the piece from Sharifi, a renowned New York-based composer, who felt personally connected to the Arab Spring because of his Middle Eastern heritage.

"Something in the Middle East has undeniably changed. And I tried to honor that shift in this piece," said Sharifi, who utilized Arabic maqam, a melody unique to traditional Arabic music.

"The first movement gives us a sense of place ... and continues in a somewhat programmatic fashion, touching on the tragic event that ignited the protests, and continuing into the propagation of the revolutions," said Sharifi. "The second movement is a respite, a change to contemplate what has happened. And the third hopes to energize and inspire the work that is to come."

The 30-minute documentary was the first work MIT Video Productions produced specifically for broadcast television. It includes not only interviews and the story behind *Awakening*, but also the performance of the piece itself, first performed by MITWE in March 2012.

"We welcomed the opportunity to collaborate with Fred, Jamsheid, and the remarkable MITWE student musicians, and for the additional opportunity to apply the collective talents of MIT Video Productions in crafting a performance documentary for WGBH," said Larry Gallagher, producer of the documentary and director of MIT Video Productions. "It captures in musical form the great optimism and the great uncertainty unleashed by the Arab Spring," reflected MIT Associate Provost and Professor of History, Philip S. Khoury.

The piece was a career highlight for Sharifi, who worked on the composition as an artist in residence at MIT in March of 2012. "Working with Fred Harris and the MIT Wind Ensemble on Awakening was one of the most rewarding artistic experiences of my life," said Sharifi. "Fred and the musicians in the group were committed, passionate, and unfailingly musical in bringing the piece to life."

Sharifi graduated from MIT with a degree in 21E (Humanities and Engineering), and completed his graduate studies at Berklee College of Music, earning a degree in Jazz Composition and Arranging.

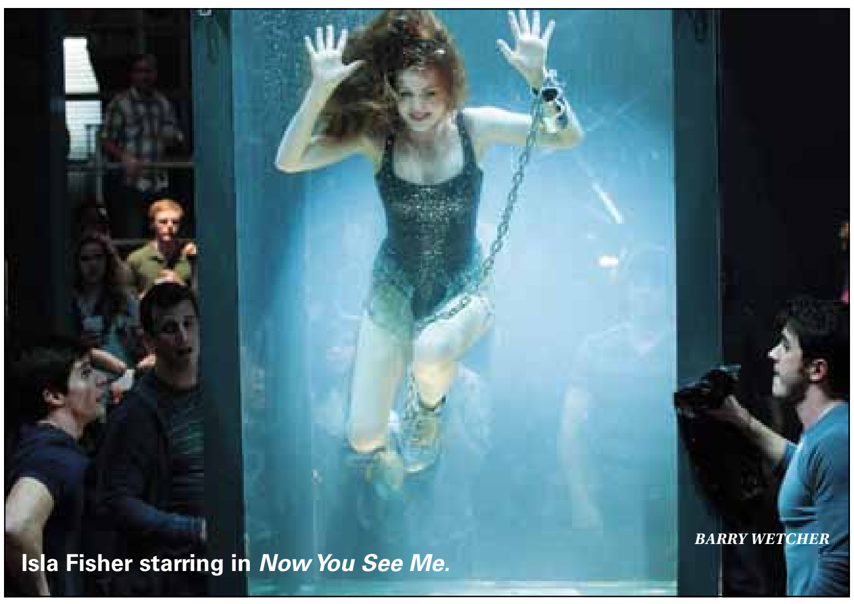
SINA MOHAMMADI

MIT Wind Ensemble Director Dr. Fredrick Harris and flutist Emily L. Jackson '12 congratulate composer Jamsheid Sharifi '83 after a performance of *Awakening*.

Emmy Award-winning director Bob Comiskey helped create the documentary; he called the composition "beautiful," "at times delicate, meditative, and then immensely powerful," seasoned by "a Middle Eastern flavor."

Since 2001, MITWE has commissioned 35 original works by MIT faculty and internationally renowned composers. *Awakening* marks the first time PBS has broadcast an MIT music documentary. A fixture at MIT and the greater Boston's arts community, the ensemble performs four concerts on campus annually.

BARRY WETCHER
Jesse Eisenberg in *Now You See Me.*


BARRY WETCHER
Isla Fisher starring in *Now You See Me.*

MOVIE REVIEW

Fool me please

Not quite highbrow magic

By Roberto Perez-Franco
STAFF WRITER

★★☆☆☆

Now You See Me

Directed by Louis Leterrier

Starring Jesse Eisenberg, Mark Ruffalo, and Woody Harrelson

Now You See Me is the story of four small-caliber magicians that pop out of nowhere to form a magic troupe called "The Four Horsemen" and pull off a jaw-dropping magic trick: robbing millions of euros from the vault of a Parisian bank without ever leaving their stage in Las Vegas. The heist gets them the attention of the media, the public, and — since they promises even bigger acts in the near future — even the FBI and Interpol.

If you have seen the trailer for *Now You See Me*, you may be tempted to give it a try. I know I was. It appealed to me on three fronts: first, it looked like a tempting intellectual puzzle; second, it featured some of my favorite actors; and third, it just looked like a lot of fun. So I went to see it with great expectations. Not surprisingly, they were only partially fulfilled.

The film was good fun, no doubt about that. It is a nice flick to kill two hours if you want to be entertained with shiny objects and sleights of the hand. The cast includes many recognizable names, such as Jesse Eisenberg, Mark Ruffalo, Woody Harrelson, and (get this) both Morgan Freeman and Michael Caine, as well as others you wish you knew, including a cute-as-a-button Isla Fisher and an even-cuter Mélanie Laurent, last seen burning down a theater containing Hitler, in Tarantino's *Inglorious Basterds*.

But *Now You See Me* was not the brainteaser I was hoping it would be, namely a kind of modern take on magic from the same shelf as *The Prestige* or *The Illusionist*. I would say, unless you are fifteen, sport a double-digit IQ, or have a particular fetish for the 'magic of magic,' I would recommend you to significantly lower your expectations before entering the theater, and to remember throughout the movie that big names don't necessarily mean great performances (or even interesting characters) and that for magic to work you must suspend disbelief, put up with the pompous posturing and — despite what Jesse says — not look too close.

As with any magic act, for this film to work you have to willingly go through the motions: you know you want to be fooled, and when you are you like it; then you want to be shown how you were fooled, at which point you will like it even more; and finally, you want to be fooled one last time before being sent home wondering how they pulled that final trick off. That's how it is supposed to work in this movie, and that's how it works at least in the first two accounts. Yet when it comes to the final trick, its lack of plausibility or coherence with the previous narrative will have you leaving the theater with a feeling that, you were fooled alright, but not in the way you wanted.

VIDEO GAME REVIEW

Movie or game?

Great graphics, terrible gameplay

By Keith Yost
STAFF WRITER

★★☆☆☆

Tomb Raider

Crystal Dynamics

Square Enix

Released March 2013

For PC, PlayStation 3, Xbox 360

A couple weeks ago, Nintendo declared that it was going to enforce its copyright over third-party made "Let's Play" videos, and began demanding ad revenue from the YouTube videos of gamers playing Nintendo games.

The copyright claim sounded excessive to me. I could understand if Paramount Pictures or Warner Brothers took issue with replications of their movies on YouTube, since virtually all of the value derived from such clips would be due to the movie itself, not the person playing it. But games are an interactive medium, and the value of a "Let's Play" depends quite a bit on how a player chooses to manipulate that medium. At the extreme, sometimes all of the value of watching a game being played is created by the players themselves — no one credits the ancient inventors of chess when two grandmasters produce brilliance on the board.

However, the experience of playing *Tomb Raider* makes me question the distinction I draw between movies and video games, because at its core, *Tomb Raider* is really not much more than a long and boring movie, interrupted at times by what amount to annoying DVD menus. A "Let's Play" of *Tomb Raider* would be superior in every way to playing the game itself; Crystal Dynamics and Square Enix should get their lawyers on the phone quickly before someone with a copy of the game and frame capture software makes their intellectual property obsolete.

To its credit, *Tomb Raider* gets one thing right: the graphics are amazing. With the settings cranked up to 11, the game delivers Crysis-quality visuals, and even on low settings yields something reasonably impressive. Of course, given that most of what you look at in the game is the body of a young Lara Croft, the quality of graphics makes one wonder if the game is a merely a thinly-veiled exercise in ephebophilia, to which I think the rational response is: obviously. The game might be swimming in a pool of insipid mediocrity, but no one should accuse the developers of not understanding their target audience.

COURTESY OF CRYSTAL DYNAMICS
A scene from *Tomb Raider,* a new game by Crystal Dynamics.

Everything else about the game rates between average and bad. The gameplay consists of almost nothing but obnoxious quick-time events and a disjointed string of various bland game mechanics, suddenly introduced and then just as quickly dropped. It is ostensibly an RPG, but the only things you can level up are related to the grab-bag of game mechanics, meaning that most of the time you're just randomly assigning your points to things like "Improved Underwater Basket Weaving," and hoping that the next section is the water level where Lara has to please an audience of basket critics. At first glance, the game feels like an open world, but it doesn't take long to realize you're just traveling on rails for ten hours through a couple dozen levels.

The plot, voice acting, and writing are an improvement over the gameplay, but not by any great stretch. I guessed about 90% of the game's plot within the first thirty minutes, with most of the rest becoming obvious in the next few hours. The script and acting are fine, but don't really stand out. It's hard to connect to Lara as a character, and the game doesn't present anyone else to get attached to. Sometimes a game gets carried by its gameplay, sometimes it gets carried by its plot — *Tomb Raider* has the sort of plot that could get carried if it were a fun game, and the sort of gameplay that couldn't get carried if its life depended on it.

There comes a point in in the spectrum between video games and visual media where it's hard to distinguish between the two. I don't think this is a bad thing, but games like *Tomb Raider* that occupy this point have to contend with competition from movies and TV series that should give them pause. How does the 10-hour *Tomb Raider* movie compare with, say, the *The Hobbit* trilogy? How does it compare with the latest season of *Game of Thrones*? And given this comparison, can you really ask $60 for the game while Mr. Peter Jackson is undercutting you? Does it make sense to spend $100 million dollars to make the game, when HBO can produce a GoT season for $60 million?

Don't buy *Tomb Raider*. If you really feel the need to experience it, go watch someone play it on YouTube. But don't be shocked if Square Enix ads play between acts — this is one of the unfortunate instances in which copyright claims would have substance to them.

COURTESY OF SQUARE ENIX
A scene from the action-adventure game *Tomb Raider*.

CONGRATULATIONS

MIT 2013

PUNT ET TOOL

83%

A RECORD BREAKING CLASS PARTICIPATION

HAS BEEN ACHEIVED

IN THE SENIOR GIFT CHALLENGE

THESE LEADERSHIP DONORS are now members of
MIT'S WILLIAM BARTON ROGERS SOCIETY

Shelley Ackerman
Arfa Aijazi
Noor Al Sharif
Lauren Allen
Eyas Alsharaiha
Kuljot Anand
Anirudh Arun
Arthur Astorino
Charles Barr
Khristian Bauer-Rowe
Sergio Benitez
Archit Bhise
Chandler Burfield
Camila Caballero
Steven Carreno
Zachary Casas
Carlos Castellanos
Emily Chen
Ignatius Chen
Nancy Chen
Anna Christensen
Ian Cinnamon
Nikita Consul
Jonte Craighead
Samira Daswani
Amanda David
Lia DiGiovanna
Christopher Dolan
Gustaf Downs
Aron Dreyfoos
Raimundo Esteva
Adaeze Ezeh
Rachel Foley
Stephen Freiberg
Lila Fridley
Clare Frigo
William Gaviria
Alexandra Ghaben
Michael Gibson
Malcom Gilbert
Gustavo Goretkin
Kathryn Greskoff
Edward Ha
Kyle Hannon
Alison Heuser
Jason Hoch
Matthew Hohenberger
Justin Holmgren
Rebecca Jackson
Marisa Jasso
Sarah Jensen
Jamie Kang
Anurag Kashyap
Bat-Ami Katzman
Meghan Kenny
Faith Keza
Hana Khalil
Chrystelle Kiang
Hailey Kopp
Arooshi Kumar
Alec Lai
Kevin Lang
Garrett Lau
Josepher Li
Tanya Liu
Zier Liu
Gabriel Long
Victoria Lu
Maria-Elena Martinez
Cameron McCord
Fiona McCoy
Zsuzsa Megyeny
Hayden Metsky
Samuel Millington
Shreesh Naik
Crystal Noel
Edward Obropta
Curran Oi
Joshua Oreman
Katarina Popovic
Nathaniel Porter
Maxwell Pruner
Christina Qi
Samuel Reineman
John Reynolds
Fareeha Safir
Arun Saigal
Alexandra Sailsman
Jaclyn Schein
Bahar Shah
Chinua Shaw
Eric Shyu
Denzil Sikka
Charles Sims
Russell Spivak
Krithi Sundaram
Karan Takhar
Narendra Tallapragada
Shannon Taylor
Lyne Tchapmi Petse
Raymond Tilden
Zachary Tomlinson
Paula Trepman
Paul Uche
Patrick Vatterott
Brinda Vijaykumar
Nathan Villagaray-Carski
Laura Wacker
Jack Wanderman
Anne Warren
Robert Weber
Christian Welch
Alexandra Westbrook
Sally Wolfe
You Yoon

ARTS

MOVIE REVIEW

More of the same

The new *Star Trek* is as familiar as the classics

By Roberto Perez-Franco
STAFF WRITER

The latest big-screen installment of the *Star Trek* franchise is great news for all *Star Wars* fans ("Wait, wait... what?" In a minute.) Although as an action movie it may appeal to a broader audience, *Into Darkness* is designed to delight Trekkies, the more hardcore they are the better. It is the perfect *Star Trek* movie, with all the familiar trimmings of the old-school classics we have come to love.

Your Captain Kirk is at the bridge of the Enterprise, courageous and impulsive, human to a fault, driven by instinct and gut-feelings. Your Spock is there by his side, more Vulcan than President Obama, rational and cool, driven by logic and rules. And your Kirk-Spock interplay is there, with the constant friction, the witty banter and — as the plot thickens towards a resolution — a breaking of their respective stereotypes and the predictable reversal of their roles (Kirk serenely sacrificing himself for the good of the many, and Spock letting his emotions come to the surface), the subsequent deepening of their friendship and a renewed mutual appreciation of their complementary characters. Like Don Quixote and Sancho Panza, or peanut butter and jelly, these two are made to go together, and they know it as well as you do.

The usual *Star Trek* laws of nature apply in this movie, too. People can breathe without the need for any special equipment in the most unexpected settings, be it on the surface of a foreign planet or inside the core of a warp reactor. Aliens are humanoid in everything but the skin, and most speak English better than Scotty or Chekov. As in the first movie, in J.J. Abrams' reboot of the franchise, there is a cameo of an aging character from the previous cast, and a second character from that past makes an appearance with a new face.

So this is all familiar territory. Yes, the colors are more vibrant and the sounds are crisper, the special effects are more convincing and the uniforms are fancier (the fabric has this little pattern of Federation shields... pretty cool, if you ask me.) The most innovative thing may be that the Enterprise leaves behind a trail of twinkling confetti when it goes into warp, and the fact that the movie was filmed in 3D. At the risk of appearing to be a 21st century Luddite, I have to say that the 3D cinematography may actually have detracted from the movie. For the most part it proves distracting and makes it hard to follow the fast-moving action, to the point that half-way through the movie I wish I had bought a 2D ticket instead. I'm not blaming the technology, but just pointing out that this particular execution looks amateurish compared to, say, Cameron's Avatar. The only point at which the 3D really pays off is in a sequence of a deep-space dive from one ship to another through a field of debris.

Compared to the previous installment, there is only one new character that brings a gust of fresh air. And I don't mean the utterly superfluous daughter of a Federation General played by the visually stunning but histrionically challenged Alice Eve (from *She's Out of My League*) whose sole raison d'être on board the Enterprise — as far as I can see — was to show off her perfect 10 body in lingerie for a few frames.

I mean the powerful and complex character played by the beautiful Benedict Cumberbatch: Khan Noonien Singh, frustrated and vengeful, a perfect blend of Q's airs of superiority and disdain for the human race and of Neo's cool looks and awesome fighting skills. Cumberbatch was a revelation to me, and the perfect match of his performance with his physical appearance — the contained rage behind the piercing blue eyes, the restrained yet menacing attitude hidden in the boyish yet wrinkled countenance — are what makes this movie memorable. Beyond him not much is new, for we have seen it all before, either in the previous Abrams movie or its more distant predecessors. Despite the new pajamas, this is your father's *Star Trek*. And that is precisely my beef with it.

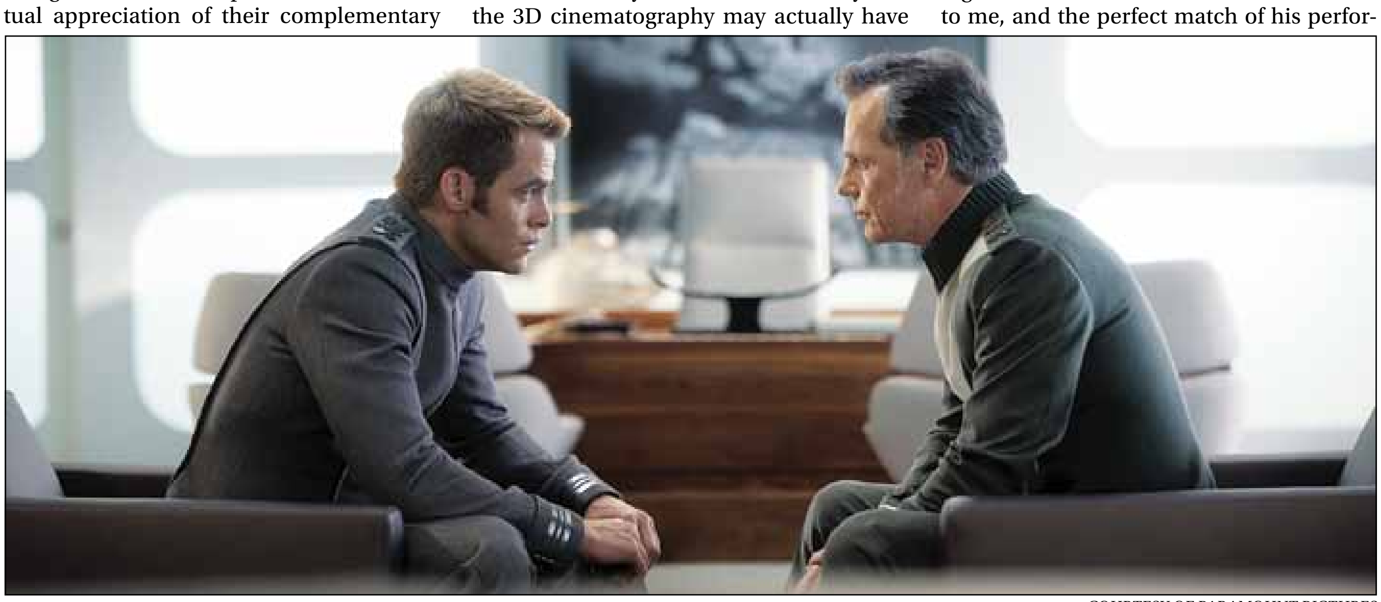
Which brings me to my comment about this movie being good news for *Star Wars* fans. Abrams could have taken an established franchise and injected new life into it with risky choices that pay off and take the narrative out of the familiar and up to new heights (i.e. what *Casino Royale* did for James Bond). Instead, Abrams went for the tried and true, taking little or no risk with *Into Darkness*. He has proven that he can start with a known, familiar universe, with its well-developed lore, characters and idiosyncrasies, and to churn out a whole new movie that fits perfectly with its predecessors. He makes new movies about an established universe, without renewing it — which is exactly what *Star Wars* fans need to know so that they can calm down after the news that Episodes VII through IX will be filmed and that Lucas would will not be at the helm. You can breathe easy now, my fellow Star Wars fans. If you want more of the same, if you yearn for new episodes of the already familiar tale, J.J. Abrams is the man for the job.

★★★★☆

Star Trek Into Darkness

Directed by J.J. Abrams

Starring Chris Pine, Zachary Quinto, Benedict Cumberbatch, and Zoe Saldana



COURTESY OF PARAMOUNT PICTURES

Chris Pine as James Kirk and Bruce Greenwood as Christopher Pike in *Star Trek Into Darkness.*

EXHIBIT REVIEW

Something new, something blue

New Blue and White puts a fresh spin on old pottery traditions

By Kathryn Dere
SENIOR EDITOR

New Blue and White

Museum of Fine Arts, Boston

Through July 14, 2013

Free with MIT ID

I grew up surrounded by blue and white dishes — Spode Blue Italian, Churchill Blue Willow, Chinese rice pattern teacups. They are comforting objects, objects of beauty, but not things that I often think about.

The story of blue and white china is a complex one. It began with cobalt pigment on white clay in 9th-century Mesopotamia; the blue and white color scheme later spread throughout Asia and eventually, Europe and the Americas. *New Blue and White* at the Museum of Fine Arts pays tribute to blue and white in a variety of contexts, and with over 40 artist studios represented and nearly 70 works, it is something not to miss. The exhibition is organized around four themes — Cultural Camouflage, Memory and Narrative, Abstract Interpretations, and Political Meaning.

The largest work in *New Blue and White* is *Yu Yu Blue* (2012), by Somerville-based artist Mark Cooper. Viewers can walk through the installation, feeling as if they have fallen down the rabbit hole — surrounded at once by walls covered in printed rice paper and unconventionally-shaped ceramics spilling from towering wooden stands.

Smaller works are equally mesmerizing. *New Dutch Blue* (2003) by Neils Van Eijk and Miriam Van der Lubbe was created as a part of the Dutch Souvenirs project. The work consists of traditional windmills decorated with Ethiopian, Moroccan, and Arabic blue and white designs — mirroring the ever-changing ethnic fabric of the country. The *Disasterware* series by Charles Krafft puts topics we would rather forget into porcelain, at one point turning a cow creamer into a *Mad Cow Creamer* (2005).

Livia Marin's 2012 *Nomad Patterns* series features vessels melting onto the shelf, much like Dali's clocks in *The Persistence of Memory*.

Perhaps some of the most interesting modern interpretations of blue and white are those that experiment with the human form. Sin-Ying Ho paints two large vases with Ming dynasty-style blue and white foliage in *Transformation: Motherboard No. 1* and *Transformation: Motherboard No. 2* (2010). The unexpected comes in the form of Adam and Eve, silhouettes with circuitry-patterned skin. Instead of painting bodies on vessels, Claire Curneen's *Blue* (2012) molds vessels into bodies, perhaps as a nod to the age-old comparison of a body as a vessel for the soul. Two slightly wrinkled, cracked porcelain bodies, blue and white and flecked with gold, stand apart, arms outstretched to each other. Whether they are reaching for each other or pulling apart is uncertain; the fragility of the connection is especially poignant.

New Blue and White is an exhibition of unlikely connections — connections between objects, connections between cultures, connections between past and present — and the new perspectives that the artists give are refreshing.

GEOFF SPEAR

Work 0808 **by Harumi Nakashima, 2008.**

MIT visiting scientist died in traffic accident

Kanako Miura, 36, died on May 19 around 3:30 p.m. after being struck by a truck while biking through Kenmore Square. Miura was a visiting scientist in Professor Russ Tedrake's Robot Locomotion Group in CSAIL.

MIT President L. Rafael Reif broke the news to the MIT community that same evening in an email to all of campus. "Our hearts go out to her friends and colleagues at MIT, and especially to the Miura family, who must absorb this terrible news from so far away," wrote Reif.

The Boston Globe reported that the driver probably did not see Miura. They also reported that Miura, who was wearing a helmet, suffered from critical injuries after being thrown from her bike and passed away at the scene.

David Watson, executive director of the Massachusetts Bicycle Coalition, expressed the importance of awareness and safety in an interview with the *Globe*.

"Everybody at this point should know we need to share the roads," he said. "Everybody bears responsibility for the safety of the people around them."

Miura had been at MIT since October, conducting research in the Robot Locomotion Group and specializing in bipedal locomotion. She had two PhDs, one in Information Science from Tohoku University in Japan and another in Electronics and Automation from Université Louis-Pasteur France. As a senior researcher at Japan's National Institute of Advanced Industrial Science and Technology, she worked on the HR-4C Future Dream robot, which had advanced locomotion capabilities such as being able to turn quickly and more accurately mimic human walking than other robots, according to an article in *Akihabara News*.

"She was not just a visitor in our group. She became a close friend and a member of our family," said Tedrake in an article on her passing in CSAIL's news website. "The energy she brought to her work was contagious, and her enthusiasm was easy to see. She loved giving tours and showing off the lab, and she had an unfailing optimism in the future and importance of humanoid robots."

A memorial fund in her name has been established to fund CSAIL Robotics. Donations can be made through *http://giving.mit.edu*.

—Bruno B. F. Faviero

LINKEDIN

MIT visiting scientist Kanako Miura died in a bicycle accident on May 19. Miura arrived at MIT last fall, and had been working in CSAIL's Robot Locomotion Group.

Eastgate evacuated after fire started in penthouse kitchen

Minor property damage on 28th floor of building

Eastgate, from Page 1

inspectors were called in to fix the electrical system and elevators, which were affected by the water. According to code, residents cannot be let into the building unless there is at least one elevator in working condition. MIT staff were also in place to retrieve emergency medications from apartments for residents who needed them.

About 25 MIT staff came in to help with transporting residents from Eastgate to Sidney Pacific and providing food and childcare. MIT police were also in place at Eastgate to update residents who were away from the building during the fire.

The kitchen where the fire began is being worked on now and will take "several weeks" to finish, according to Senior Associate Dean for Residential Life and Dining Henry J. Humphreys.

The kitchen where the fire began is being worked on and will take 'several weeks' to finish.

There is some minor property damage on the 28th floor. According to Humphreys, it is still to be decided who will pay for it.

The total cost of the cleanup and repair following the fire has not yet been tabulated yet.

Humphreys said that the emergency system did what it was designed to do. "The sprinklers went off and suppressed the fire, and the fire department put down the rest. It did what sprinkler systems are supposed to do," Humphreys said.

According to Dennis Collins (director of residential life for capital renewal, renovation, and repair), the last fire with similar consequences was in 2006 in Westgate, when residents were evacuated for 12 hours.

We get you the tickets.
You get us the review.

Arts at The Tech Established 1881

events • movies • theater • concerts
music • books • restaurants • interviews

join@the-tech.mit.edu

2013 BRASS RAT

Last Chance to order
at 2011 pricing!

GRADRAT

THURSDAY & FRIDAY, JUNE 6 & 7
10 A.M. – 3 P.M.
STUDENT CENTER LOBBY

©Balfour 1970–2013, all rights reserved.

21107

EdX releases open source code, demographic data

Students are 26% female, 22% located in the US, 14% in India, and average 30-years-old

EdX, from Page 1

come from eight countries and four continents. The first higher learning institutions from Asia include China's Peking and Tsinghua Universities, South Korea's Seoul National University, Japan's Kyoto University, and Hong Kong's University of Hong Kong and the Hong Kong University of Science & Technology. The University of Queensland in Australia pledged as well, representing only the second university from Australia to join.

> **The 15 additional school who have now partnered with edX come from eight countries and four continents.**

In addition, three European schools, Karolinska Institutet in Sweden, Université catholique de Louvain, Louvain-la-Neuve in Belgium, and Technische Universität München in Germany have signed up. Rounding out the continents is North America, with the Berklee College of Music, Boston University, Cornell University, Davidson College, and the University of Washington now onboard. Each of them has been dubbed with an "X" at the end, marking their induction into the edX online learning community.

Although these schools do not plan on offering courses until later this year or next year, edX announced the launch of more than 20 new courses from schools that had joined earlier. These courses run the gamut from WellesleyX's "Introduction to Evolution" to HarvardX's "Science & Cooking." MIT added eight of those courses, which include 24.00x ("Introduction to Philosophy") and 2.01x ("Elements of Structure"). According to edX's press release, these courses are designed to incorporate "active learning, game-like experiences, instant feedback, and cutting-edge virtual laboratories" into their classes.

Course Enrollment Data and Demographics

According to Anant Agarwal, President of edX, total course enrollment passed one million in March. However, because some people enroll in more than one class, the total number of unique students has not yet hit one million. Agarwal expects that edX will achieve that milestone within the next two weeks.

> **Females constituted 23.9 percent of those enrolled in MITx courses, and 26.4 percent of those who were active.**

In data given to *The Tech* by MIT's Associate Director of Digital Learning Isaac Chuang, 6.00x ("Introduction to Computer Science and Programming") claimed the highest enrollment this spring amongst MITx courses, although 7.00x ("Introduction to Biology — The Secret of Life") held the highest active percentage, with 13.7 percent. Here, being active implies "having attempted a significant portion of the last major examination." 6.002x (Circuits and Electronics), MIT's very first course released last year, only claimed a 2.1 percent active percentage this semester.

In addition, the percentage of female active students varied widely depending on the course. Only 12.2 percent of active students in 6.002x this spring were female, but the percentage jumped to 44.9 percent for 7.00x and 53.1 percent for 14.73x (The Challenges of Global Poverty). Compare this to the percentage of Course 6 and Course 7 majors who are female. At MIT this year, 72.9 percent of Course 7 undergraduate students are female, while only 33.6 percent of Course 6 undergraduate students are. Overall, females constituted 23.9 percent of those who enrolled in MITx courses, and 26.4 percent of those who were active. However, Chuang noted that age and gender are self-reported, and that not all students report their demographic information.

The average enrolled student age was 29.2 years old, while the average active student age was 30.9 years old, slightly under two years older. As for the countries MITx students come from, India was the second most popular country after the United States, both for enrolled and active students. About a fifth (22.1 percent) of active students came from the US, while roughly an eighth (13.5 percent) came from India.

Entire source code released

On June 1, edX released its entire learning platform as open source. The source code can be accessed at *http://code.edx.org*.

"We believe in pursuing non-profit, open-source opportunities for expanding online education around the world," the page states. "We believe it's important to support these efforts in visible and substantive ways, and that's why we are opening up our platform and inviting the world to help us make it better."

Prior to this release, edX had begun to release part of its source code in March, starting with XBlock architecture, a software development kit that allows developers to work with course components.

Stanford, UC Berkeley, and the University of Queensland have already contributed to MIT and Harvard's open source platform. Notably, Stanford, who is a partner with edX competitor Coursera, has agreed to continue collaborating with edX to develop the platform. Stanford ceased development on its own Class2Go system, features of which will be integrated into edX. Recent contributions that Stanford has made include the capabilities of real-time chat and bulk email. UC Berkeley contributed a fully integrated forum software, which was created by a team led by a Stanford graduate student.

Automatic Grading

One of the most important questions currently facing edX is how to improve its automatic essay scoring system, which uses machine learning to grade student-submitted essays. Machine learning systems look for specific features in essays (such as the use of transition words) that can be used to help determine a grade.

> **One of the most important questions for edX is how to improve its automatic essay scoring system.**

On Hacker News, social news site popular within the technology community, LightSIDE Labs founder Eljiah Mayfield expressed disapproval upon seeing the code edX uses for automatic grading. Like edX, LightSIDE Labs has developed a tool which uses machine learning to assess written text.

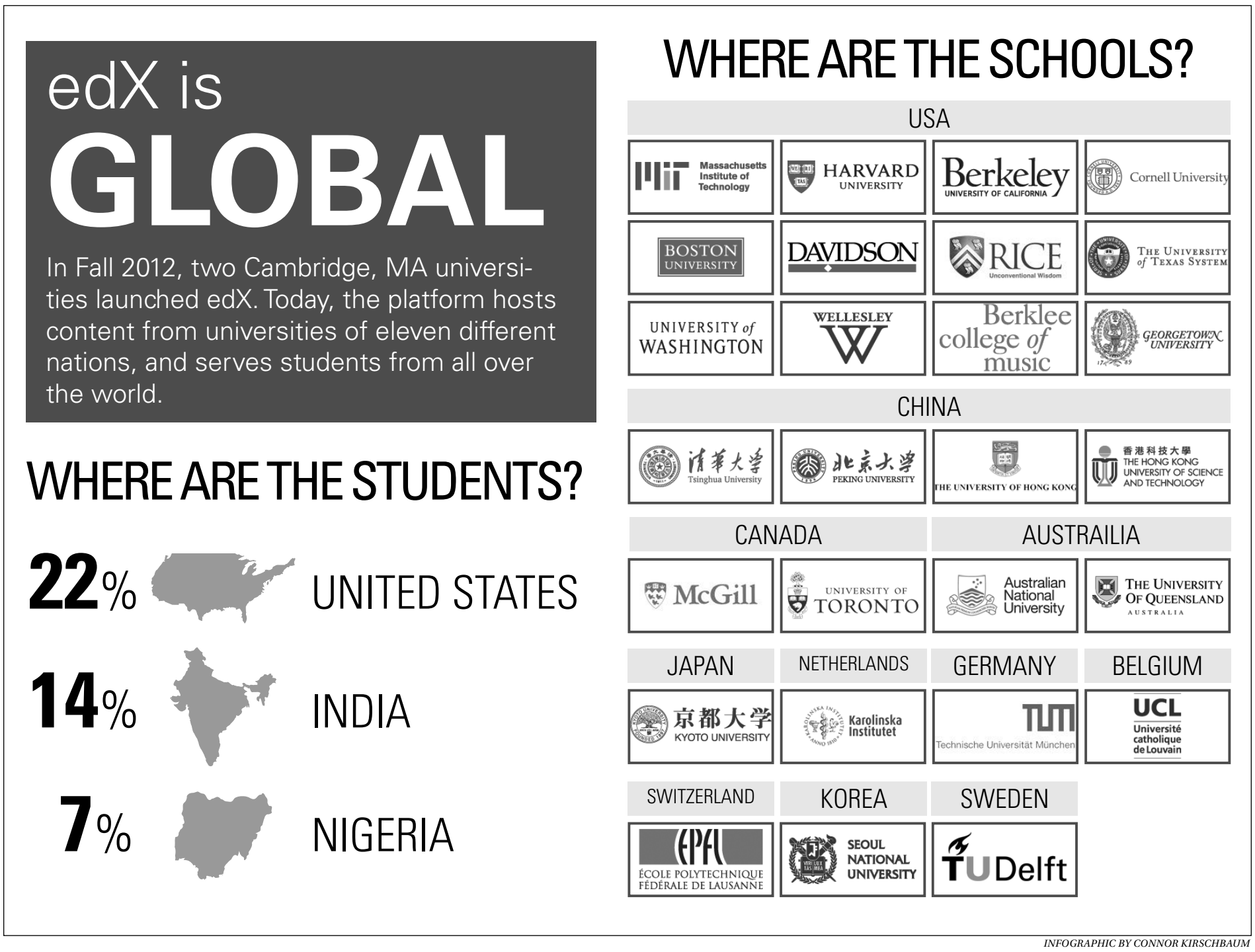
"Looking through this codebase, it's roughly the level of machine learning work that I'd expect from a first-year graduate student," Mayfield posted. "It gets the job done but is really only tailored to the very narrow task of essay grading and doesn't offer much extensibility. My guess is that for that narrow task, it does a pretty good job, but in my experience teachers are rarely satisfied with just getting a machine learning-generated score and nothing else."

> **'This is machine learning, and there is a long way to go, but it's good enough and the upside is huge.'**
>
> *—Anant Agarwal*
> EDX PRESIDENT

In contrast, Agarwal told *The New York Times* in April, "This is machine learning and there is a long way to go, but it's good enough and the upside is huge. We found that the quality of the grading is similar to the variation you find from instructor to instructor."

Nevertheless, in an edX blog post on Monday, the president gave a belated celebration of the enterprise's first anniversary last month.

"The year has gone by so fast I find it hard to believe it has been an entire year until I sit back and consider all that we've accomplished together. ... As we celebrate our first anniversary, I would like to thank all of the professors and their staff who have put so much effort toward making the edX experiment a success," Agarwal wrote in his blog post. "I would also like to congratulate the many students around the world who have contributed their unique perspective to our edX courses and expanded their own worlds along the way."



INFOGRAPHIC BY CONNOR KIRSCHBAUM

Congratulations to *The Tech*'s Class of 2013

Shelley Ackerman
Ho Yin Au
Rachel C. Bandler
Shaena Berlin
David J. Bermejo
Jacob Austin-Breneman
Kiran Bhattaram
Wendy Cheng
Moya Chin
Jaimie Chung
Kathryn Dere
Jingyun Fan
Jennifer Fong
Carlos Greaves
Akimitsu Hogge
Tiffany Ira Huang
Yü Linlin Huang
Joanna Kao
Connor Kirschbaum
Allison M. Lee
Jaswanth Madhavan
Elijah Mena
Emily Nardoni
Ryan Normandin
Jessica J. Pourian
Sam Range
Maja R. Rudolph
Fareeha Safir
Aislyn Schalck
Russell Spivak
Elise Stave
Vanessa Trevino
Paul Woods
Jenny Xie

ELIJAH MENA—THE TECH

David Cameron stops at Media Lab on US tour

British PM speaks with researchers, meets with students to discuss entrepreneurship

By Kath Xu
ASSOCIATE NEWS EDITOR

Last month, British Prime Minister David Cameron paid a visit to the MIT Media Lab as a part of his week-long tour of the U.S. to promote the United Kingdom with Prince Harry. Cameron was welcomed by Media Lab director Joichi Ito and MIT president L. Rafael Reif. Policemen stood guard outside the Media Lab throughout Cameron's visit, with at least one sniper on the roof of Senior House.

In his tour of the Media Lab, Cameron met with Media Lab faculty members and researchers. Cynthia L. Breazeal ScD '00, director of the Media Lab's Personal Robots group, had a chance to demonstrate her group's human-interacting robots, while Hugh M. Herr, who leads the Media Lab's Biomechatronics research group, gave Cameron a demonstration of his own advanced prosthetics that he wears as a double amputee.

Because Cameron's visit was kept low-key for security reasons, only a few students were invited.

No student knew until the morning of his visit who the VIP would be, although some guessed that it would be David Cameron based upon the news reports of the two British dignitaries' U.S. tour. The students present included a few MIT tour guides given the chance to help out on the ground floor, and a group of seven student entrepreneurs, composed mostly of graduate students, who were invited to speak with David Cameron.

Breazeal demonstrated to Cameron her group's human-interacting robots, while Herr presented his own advanced prosthetics he wears as a double amputee.

"We were invited by Professor Fiona Murray and were recommended to her by the Martin Trust Center for MIT Entrepreneurship," said Akshar Wunnava '13, one of the entrepreneurs. Murray, the Faculty Director of the Trust Center for MIT Entrepreneurship, led the student entrepreneurs' discussion with Cameron.

"I thought that at MIT we had some important lessons for the U.K. and for his particular entrepreneurship project in London (TechCity) about being part of an effective entrepreneurial ecosystem," explained Murray. Tech City, similar to Silicon Valley, is a region in East London in which many technology companies and universities are located.

Bridget A. Akinc G added that "the discussion was about our own entrepreneurial ventures, and lessons we had learned about creating a collaborative space for entrepreneurial companies at MIT, as the Prime Minister considers how the U.K. might replicate the entrepreneurial ecosystem of London."

'You could tell that [entrepreneurship] was a topic that he really cares about.'
—Danielle Zurovcik PhD '12

The student entrepreneurs were invited the Saturday before Cameron's Tuesday visit, as "I think Cameron wanted to meet with MIT students who were involved with fostering entrepreneurship on campus, and were pursuing their own entrepreneurial interests," said Wunnava.

Danielle Zurovcik PhD '12, who pursued mechanical engineering at MIT and is also an entrepreneur, spoke fondly of Cameron after the visit.

"He was very organic and genuine. You can tell that [entrepreneurship] was a topic that he really cares about," said Zurovcik. Cameron also asked one student about supporting herself while working on a startup. "I thought that it was very interesting that he recognized that many of us do not take salaries and have to make ends meet however we can," said Zurovcik. "Most people do not recognize that sacrifice (at least at the beginning stages) and see entrepreneurship as this glamorous thing. It shows that he understands the passion, ecosystem, and support that are needed to drive/sustain young entrepreneurs."

Bose is pleased to offer special savings for all students, employees and retirees of M.I.T.

Receive savings on most Bose® products, including the acclaimed Wave® music system III, home entertainment systems, headphones and solutions for today's most popular portable music devices.

NEW
Bose Wave® music system III
Enjoy lifelike CD and radio music in your home, office or dorm room. Awake to award-winning sound.

Bose SoundLink® Wireless Mobile speaker
Music. Whenever. Wherever. From your mobile phone or any *Bluetooth*® device.

Bose IE2 audio headphones
Enjoy music and calls with high-quality audio. StayHear® tips for greater stability during exercise and other activities.

Please direct all inquiries to the "M.I.T. Purchase Program."

1-800-298-BOSE (2673)

BOSE
Better sound through research

©2012 Bose Corporation. Delivery is subject to product availability. The *Bluetooth*® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc., and any such use by Bose Corporation is under license.

Accord for a global trove of genetic data

70 organizations agree to share genetic and clinical information

By Gina Kolata
THE NEW YORK TIMES

Seventy medical, research and advocacy organizations active in 41 countries and including the National Institutes of Health announced Wednesday that they have agreed to create an organized way to share genetic and clinical information. Their aim is to put the vast and growing trove of data on genetic variations and health into databases — with the consent of the study subjects — that would be open to researchers and doctors all over the world, not just to those who created them.

Millions more people are expected to get their genes decoded in coming years, and the fear is that this avalanche of genetic and clinical data about people and how they respond to treatments will be hopelessly fragmented and impede the advance of medical science. This ambitious effort hopes to standardize the data and make them widely available.

"We are strong supporters of this global alliance," said Dr. Francis Collins, director of the National Institutes of Health. "There is lots of momentum now, and we really do want to move quickly."

In just the past few years, the price of determining the sequence of genetic letters that make up human DNA has dropped a millionfold, said Dr. David Altshuler, deputy director and chief academic officer at the Broad Institute of Harvard and MIT. As a result, instead of having access to just a few human genomes — the complete genetic material of a person, including genes and regions that control genes — researchers can now study tens of thousands of them, along with clinical data on peoples' health and how they fared on various treatments. In the next few years, Altshuler said, researchers expect that millions of people will have their genomes sequenced.

"The question is whether and how we make it possible to learn from these data as they grow, in a manner that respects the autonomy and privacy choices of each participant," Altshuler said. No one wants to put DNA sequences and clinical data on the Internet without the permission of patients, he said, so it also is important to allow people to decide if they want their data — with no names or obvious identifiers attached — to be available to researchers.

But there are no agreed-upon standards for representing genetic data or sharing them, experts say. And there are no common procedures for assuring that patients consent to sharing their information.

"Each institution has its own approach," Altshuler said.

Medical researchers say the best way forward is to have shared databases. Do patients with a particular genetic aberration tend to do well with a particular therapy? Do patients with another mutation have greater odds of developing cancer?

Collins noted that cancers are so genetically complex that, most of the time, a mutation seen in a cancer patient will be uncommon. To figure out its significance, data from hundreds of thousands of patients — the world's collected data — on that mutation are needed.

Brad Margus, an advocate for children with rare diseases, enthusiastically supports the idea of data sharing. As the father of two sons with a rare disease, ataxia telangiectasia, or A-T, and founder and volunteer president of the A-T Children's Project, he says he learned how progress is made.

"There is this perception that the key to the next breakthrough is from someone finding a gene that is sitting somewhere and someone having a eureka moment," Margus said. "What I learned is that it does not usually happen that way." Often what is needed are huge genetic data sets, he added, "so people can be proactive when they have an idea."

Pooled data are also needed to understand the genesis of big killers like heart disease, researchers said.

Recently, for example, Dr. Sekar Kathiresan, director of preventive cardiology at Massachusetts General Hospital and a geneticist at the Broad Institute, sought to find out whether high density lipoprotein, or HDL, the so-called good cholesterol, actually protected people against heart disease. Did people who happened to have genetic changes that resulted in lifelong high levels of HDL have a lower risk, he asked?

They did not, he concluded, but his study required genetic data from more than 100,000 people collected in 20 studies by researchers from around the world. It took three years to gather the data, put them in a form that allowed investigators to analyze them, and to do the analysis.

"We need standard formats so we don't have to spend two years figuring out how to merge data together," Collins said.

Swartz parties come to agreement on evidence

Identifying information, network vulnerabilities will be redacted from case documents

Swartz, from Page 1

Swartz's suicide on Jan. 11. After Swartz's suicide, media attention and interest in the case heightened, particularly the question of whether the prosecution overstepped in their role. The House Committee on Oversight and Government Reform began an investigation into the case in January. Various media organizations, activists, and Congress requested certain documents that were under the protective order.

Swartz's lawyers filed a motion on March 15 requesting that the documents under protective order, including many MIT documents, be made publicly accessible. In particular, they requested that the court release the documents without redacting the names and official titles of all law enforcement personnel and employees of MIT and JSTOR that appear in the evidence. Swartz's lawyers pointed out that many of the names and titles were already publicly known and that redacting the names and titles would make the documents difficult to comprehend. Also, both MIT and JSTOR had produced some of the documents for the case when there was no protective order keeping them from the public. Swartz's lawyers also said that there was a compelling public interest in the unredacted documents being made public.

The 88-day process began this week, and at the end, the documents that have been hidden from the public during this case will be available, but redacted, to the public.

Both MIT and JSTOR agreed that parts of the documents should be made public, but with some redactions to protect employees involved. MIT had been the target of several threats in response to Swartz's death. In February, a false report of a gunman on campus targeting MIT president L. Rafael Reif in retaliation for Swartz's death shut down MIT for several hours. MIT's network was also hacked on three separate occasions. In a letter in *The Tech* on March 20, Reif said that some of the documents contain information about vulnerabilities in MIT's network and that he had the responsibility to "protect the privacy and safety of those members of the community who have become involved in this matter in the course of doing their jobs for MIT, and to ensure a safe environment for all of us who call MIT home."

In the letter, Reif said that the MIT-related documents would be released, with names and titles and network vulnerabilities redacted, at the same time as releasing the Abelson report. MIT computer science professor Hal Abelson was tasked by Reif to investigate MIT's role in the Swartz case after Swartz's suicide in January. In a letter from Abelson to *The Tech* on May 14, Abelson said that the plan was to give the report to Reif "this summer."

On May 13, Judge Gorton sided with MIT and JSTOR, saying that documents could be released with some identifying information redacted and ordered all parties (MIT, JSTOR, and the government) to submit an agreement as to the release of the documents. The parties submitted the plan on Friday, and was signed into action by the judge on Monday. The 88-day process began this week, and at the end, the documents that have been hidden from the public during this case will be available, with parts redacted, to the public.

Solution to Crossword

from page 7

S	C	A	M		S	Y	N	C		T	H	A	W	S
N	O	G	O		H	E	A	R		A	E	S	O	P
L	O	O	T		A	L	S	O		C	L	A	R	A
			T	E	L	L	A	W	H	O	P	P	E	R
S	C	R	O	L	L			D	A	M				
O	H	O		W	O	L	F		D	A	P	P	L	E
W	A	L	L	A	W	A	L	L	A		H	O	O	F
I	N	L	A	Y		S	A	Y		S	E	T	O	F
N	E	E	R		S	T	I	L	L	A	W	A	K	E
G	Y	R	A	T	E		R	E	E	L		T	E	C
				H	A	M			E	S	C	O	R	T
S	Q	U	I	R	R	E	L	A	W	A	Y			
O	U	N	C	E		M	A	M	A		N	A	I	L
B	I	D	E	S		O	V	E	R		I	D	L	E
S	K	O	S	H		S	A	N	D		C	O	L	T

Solution to Techdoku

from page 7

2	3	5	1	4	6
5	6	2	4	1	3
6	1	3	5	2	4
4	5	1	3	6	2
3	4	6	2	5	1
1	2	4	6	3	5

Solution to Sudoku

from page 7

1	7	4	9	3	8	2	6	5
3	2	9	7	5	6	4	8	1
8	6	5	1	2	4	3	9	7
2	4	6	8	1	9	5	7	3
9	3	7	2	6	5	8	1	4
5	1	8	3	4	7	6	2	9
4	5	1	6	7	2	9	3	8
6	9	3	5	8	1	7	4	2
7	8	2	4	9	3	1	5	6

Know something important we should write about?

(We probably don't know about it.)

Let us know.

news@tech.mit.edu

Congratulations, 2013 graduates!

Graduation to do's:

- ☑ Cap and gown
- ☑ Cardboard boxes
- ☑ Packing tape
- ☐ **Health insurance?**

If you're a member of the class of 2013, your enrollment in the Student Extended MIT Health Plan ends on **August 31, 2013**.

To continue with a Blue Cross Blue Shield plan or a Massachusetts Health Connector plan, you **MUST** apply by **July 15, 2013**.

MIT Health Plan

Need more information?
Visit **medweb.mit.edu**

OLIVER WYMAN

DISCOVER **OUR** WORLD

Oliver Wyman is a leading global management consulting firm that combines deep industry knowledge with specialized expertise in strategy, operations, risk management, and organization transformation. With offices in 50+ cities across 25 countries, Oliver Wyman works with the CEOs and executive teams of Global 1000 companies.
An equal opportunity employer M/F/D/V.

GET THERE FASTER

Oliver Wyman congratulates and welcomes the following exceptional individuals to our firm:

ANNA CHRISTENSEN
ANNING WANG
DHAVAL ADJODAH
HAILEY KOPP
LARRY PANG
LINDA ZHANG
RONALD WILCOX

MARSH & McLENNAN COMPANIES

MIT president top earner second year in a row

Hockfield, making over $1 mil., leads familiar list of top salaries at the Institute in 2011

By Anthony Yu
STAFF REPORTER

MIT has released the salaries of its highest compensated employees for the calendar year 2011, which are required to be publicly disclosed as part of its tax returns for the fiscal year 2012 (July 1, 2011 to June 30, 2012). During her last full year as president, Susan Hockfield was MIT's highest compensated employee, receiving $1,199,877 in total benefits. This year is only the second time that a MIT president received total compensation exceeding one million dollars, with Hockfield receiving over a million in 2010.

Of her total compensation of $1,199,877, former MIT president Susan Hockfield received $1,042,110 in total paid compensation, with retirement and other nontaxable benefits making up the difference. Since the president is technically required to live on campus, MIT includes $70,000, counted as nontaxable benefits, for the housekeeping of the MIT-owned residence Gray House. Overall, Hockfield's total compensation increased 19 percent (not including inflation), up from $1,006,969 the previous year.

Among collegiate presidents, Hockfield's income is by no means the largest. According to the *Chronicle of Higher Education*, Graham B. Spanier, president of Penn State University, was the highest paid public college president, receiving over $2.9 million. Last year, the salaries of Yale, Columbia, UPenn, and Dartmouth presidents eclipsed Hockfield's.

> **Both Hockfield's paid and total compensation remain well above that of Drew Faust.**

However, both Hockfield's paid and total compensation remain well above that of Harvard University President Drew G. Faust, who received $899,734 in total compensation. The large difference can be attributed to Hockfield's "other reportable compensation." Compared to Hockfield, Faust received $8,665 in addition to her higher base salary of $720,441. As part of Hockfield's other reportable compensation of $346,056, MIT paid $125,000 into an account for the benefit of the president in the calendar year of 2011. The president is not able to access that account unless he or she has served a decade, or is no longer serving as president. Hockfield, who announced her resignation last February, stepped down as president last fall. Current MIT president L. Rafael Reif received $658,285 in total compensation during 2011 as the provost.

While MIT lists Hockfield as its highest compensated employee in 2011, Seth Alexander, president of the MIT Investment Management Company, was not far behind with a total compensation $1,175,941. Compared to the year before, his total compensation dropped $140,522, down 10.7 percent, from $1,316,463. However, unlike Hockfield, the plurality of Alexander's salary came from bonus compensation, totaling $556,449, down from $709,001 the year before. According to MIT's Form 990, which discloses select financial information of an organization to the public, the size of incentive compensation is dependent on the performance of MIT's endowment "relative to peer and market benchmarks." The MIT News Office reported that the Institute's endowment grew 17.9 percent and 8.0 percent in the fiscal year 2011 and 2012, respectively. Steve Marsh, who manages MIT's real estate also made the list, receiving $734,181 in total compensation.

MIT also reports that Alexander and Marsh received an additional $145,000 and $62,946 of incentive compensation in January 2011. These amounts were not included in the schedule that listed the top salaries of the Institute because "these amounts can increase or decrease depending on the performance of the endowment and contingent on continued employment by MIT." In fact, considering this additional compensation, Alexander may still be MIT's highest paid employee. Daniel Steele, managing director of private equity, who made the highest compensated list two years in 2009 and 2010, failed to make an appearance for 2011.

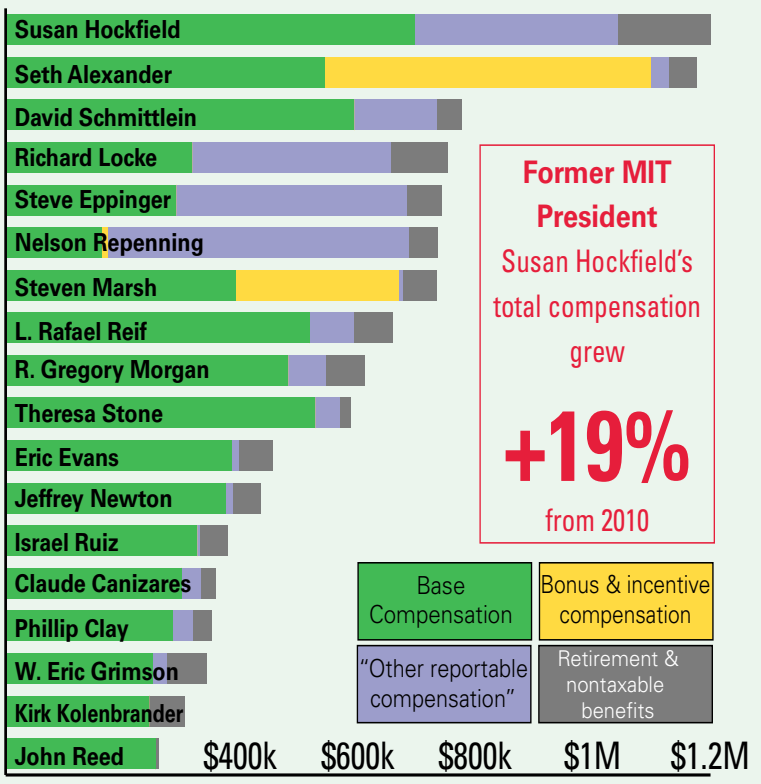
Several faculty members of the Sloan School of Management are also among MIT's highest compensated employees. Dean of the Sloan School David Schmittlein, Professor Richard Locke, outgoing Head of Political Science, Professor Nelson Repenning, and Professor Steve Eppinger all received in excess of $700,000 in total compensation for the fiscal year of 2012.

For Professors Locke, Repenning, and Eppinger, much of the additional compensation comes through Sloan's Executive Education Program. The Executive Education program offers professional development and new education opportunities for seasoned business professionals. Any income derived by professors from the Executive Education program is reported as "other reportable compensation."

Some of MIT's highest paid employees are also executives who receiving income from sitting on the boards of various companies. Those amounts are not reported in MIT's released numbers.

MIT's highest compensated employees of 2011

Name	Title	2011 Base	2011 Paid	2011 Total	2010-2011 %	2010-2011 Δ
Susan Hockfield	President	$696,054	$1,042,110	$1,199,877	19.2%	$192,908
Seth Alexander	President of MITIMCO	$542,576	$1,128,025	$1,175,941	-10.7%	-$140,522
David Schmittlein	Dean, Sloan School	$593,365	$733,502	$777,059	2.0%	$15,438
Richard Locke	Head of Political Science	$317,636	$656,078	$753,429	N/A	
Steve Eppinger	Professor at Sloan	$290,583	$682,396	$743,338	N/A	
Nelson Repenning	Professor at Sloan	$163,646	$685,771	$735,330	2.9%	$21,046
Steven Marsh	Managing Director, MITIMCO	$391,519	$676,408	$734,181	6.7%	$45,788
L. Rafael Reif	Provost	$517,936	$593,132	$658,285	3.1%	$19,758
R. Gregory Morgan	VP & General Counsel	$480,728	$544,123	$612,187	2.5%	$15,063
Theresa Stone	Exec. VP & Treasurer	$526,981	$569,496	$586,813	-3.3%	-$19,852
Eric Evans	Director, Lincoln Lab	$384,334	$396,964	$453,872	4.9%	$21,230
Jeffrey Newton	VP for Resource Development	$374,153	$386,613	$433,442	-2.7%	-$12,072
Israel Ruiz	Exec. VP & Treasurer	$326,156	$331,156	$377,866	N/A	
Claude Canizares	Vice President	$299,224	$332,889	$356,892	-11.5%	-$46,186
Phillip Clay	Professor, DUSP	$283,856	$318,738	$350,821	-11.6%	-$45,896
W. Eric Grimson	Chancellor	$250,617	$274,417	$342,000	6.9%	$22,157
Kirk Kolenbrander	VP & Secretary	$244,266	$244,266	$304,692	4.3%	$12,547
John Reed	Chairman	$255,220	$255,220	$260,376	47.4%	$83,743



INFOGRAPHIC BY ANTHONY YU

These data are for calendar year 2011, from Jan. 1, 2011 through Dec. 31, 2011, and comes from MIT's IRS Form 990, the tax return for non-profits, which was filed May 15, 2013 for tax year 2012.

"2011 Base" stands for "Base compensation," which are "nondiscretionary payments to a person agreed upon in advance, contingent only on the payee's performance of agreed-upon services (such as salary or fees)," from column B(i) of Schedule J Part II of the form.

"2011 Paid" or "Paid compensation" is the "reportable compensation from the organization (W-2/1099-MISC)" column from Part VII Section A of the 990 OR the sum of the column B(i), B(ii), and B(iii) of Schedule J Part II of the form.

"2011 Total" or "Total compensation" includes that as well as "retirement and other deferred compensation" and "nontaxable benefits" from column E of Schedule J Part II of the form.

The percentage changes (% columns) and the differences (Δ) are based on total compensation.

MIT Investment Management Company (MITIMCo) employees compensations do not include incentive compensation which "could have increased or decreased depending on the performance of the endowment" and are contingent on continued employment by MIT.

Professors Locke, Repenning, and Eppinger appear because of their participation in the Sloan School of Management's Executive Education program.

HO YIN AU—THE TECH

MIT students, faculty, and staff participated in the second performance of *UP: The Umbrella Project* on Sunday, May 19. Each umbrella was outfitted with red, green, and blue LED lights that participants could control. The project is a collaboration between MIT's CSAIL and dance company Pilobolus.

NBA finals: San Antonio Spurs vs. Miami Heat

With Popovich coaching, point guard and power forward advantage for Spurs

By Austin Osborne
SPORTS STAFF

Who will take this year's NBA finals? *The Tech*'s Austin Osborne evaluates the positional matchups between the Miami Heat and the San Antonio Spurs.

Point Guard

Spurs point guard Tony Parker has had an outstanding season, having led San Antonio to a Western Conference Finals sweep over the Memphis Grizzlies last week. Averaging 23 points and over 7 assists in the postseason, he is the most dynamic player on the Spurs roster. The Heat has struggled to defend point guards in the playoffs this year, and Parker will be no exception. Unless LeBron is matched up against him, (which could happen, if the Heat employ the same strategy that they used against Derrick Rose in 2011) Parker could have a huge series. On the flip side, Mario Chalmers has been a fairly consistent presence as point guard for the Heat. Chalmers isn't going to win the series for them, but they need him to play well if they want to repeat as NBA Champions. That means that he must make open threes that are given to him, and he must distribute the ball to the Big 3.

Advantage: Spurs

Shooting Guard

Danny Green is a sharpshooter. Although he wasn't particularly effective in Games 3 and 4 against Memphis, Green can definitely get hot in the three-point range quickly. He is averaging 10.5 points per game in the playoffs so far, and the Spurs would appreciate it if he could continue that production against Miami. Dwyane Wade played like he had something to prove in the pivotal Game 7 against Indiana and it showed in the box score. After a very lackluster first 6 games, Wade had 21 points and 9 rebounds in the series clincher, showing that he is still a superstar in this league. Although he has been hampered by a nagging knee injury, he is still the number two player on Miami's roster, and the Spurs must take him into account at all times. If he is allowed to get 20 points every game, San Antonio could be in trouble.

Advantage: Heat

Small Forward

This matchup isn't really fair to Kawhi Leonard, a good player in his own right, but when the greatest player in the world is on the other side of the court, you're bound to be overshadowed. There was much talk during the Indiana series about LeBron James reverting back to his days in Cleveland where he took almost all the shots and was forced to singlehandedly lead his team to success. As great as he is, that won't work against the Spurs. He will definitely score points, but that won't directly translate into team success. James must play as he has all season and how he played in Game 7 against the Pacers. Kawhi Leonard is obviously going to have trouble guarding him, but I expect him to get help throughout the series. Leonard is a valuable player for the Spurs going forward, as he is only 21 years old. He has been shooting the 3 very well this postseason, and San Antonio will need him to maintain that production in the Finals.

Advantage: Heat

Power Forward

Tim Duncan has found the fountain of youth. After experiencing a decline in performance after 2009, Duncan re-established himself as a dominant post presence again this season, averaging almost 18 points and 10 rebounds per game. He will be the key to this series, and will need to dominate in the same way that Roy Hibbert did in the Eastern Conference Finals. Duncan must attack Miami's frontcourt at all times and avoid getting into foul trouble. Miami struggles with physical post players, so Duncan should be able to have his way in this series. Udonis Haslem should get the starting spot for Miami, as the Spurs play big, similar to Indiana. Shane Battier has no chance to defend Duncan, so the Heat will need to play someone with size. Haslem is a serviceable player, but he will be in the game for his defense mostly.

Advantage: Spurs

Center

Chris Bosh apologized to Miami during the Pacers series for not playing up to his potential, and while he still only scored 9 points in Game 7, he appeared to be more interested in grabbing rebounds than he was in previous games, getting 8 total. Simply put, the Heat needs Bosh in this series. They can't win if he continues to produce like a role player. They need him to rebound like someone who is 6'11 should and they need him to play physically, rather than drifting to the 3-point line so much.

The Spurs are going to attack exactly the same way that Indiana did, and Bosh must hold his ground for the Heat to win. Tiago Splitter is another big man who doesn't really rebound, but he fills his role well in San Antonio. He is incredibly efficient, scoring on a low number of attempts and he does a decent job defending opposing big men.

Advantage: Heat

Bench

Both teams are deep, with Miami's bench headlined by Ray Allen, Norris Cole and Chris Andersen. Andersen has been outstanding this postseason, and he adds a spark of energy that Miami sorely needed off the bench. Allen is one of the best shooters of all time and he is constantly being set up for wide open threes by LeBron. The Spurs, on the other hand, have one of the best sixth men of all time in Manu Ginobili who should wreak havoc in this series. They have shooters of their own on the bench, in Gary Neal and Matt Bonner. Overall, the two second units are about even.

Advantage: Even

Coach

Gregg Popovich is one of the best coaches of all time and he has had an extra week to prepare his team, while the Pacers and Heat battled for the Eastern spot in the Finals. He has surely been watching the series and has seen the Miami weaknesses that were exposed, so rest assured that he will come into the series with a gameplan to exploit them. Erik Spoelstra has done a great job in his own right managing the talent of the Heat. After almost letting the Eastern Finals slip away, he did a good job preparing his team for Game 7 and utilizing his entire roster to their maximum potential. He also got creative with his lineups in order to combat the physical play by Indiana, which is a credit to his ability to adapt. This will be key in the Finals, as they are playing a Spurs team that can throw many different styles and strategies at their opponents.

Advantage: Spurs
Prediction: Spurs in 7

CONGRATULATIONS
MIT CLASS OF 2013

To MIT Federal Credit Union Members,
thank you for allowing us to serve you these past few years. You may be graduating, but we'll always be here to be your financial partner.

MIT FEDERAL CREDIT UNION
The smart money

MITFCU will be there no matter where your future takes you.

- Access your account, pay bills, and deposit checks from anywhere using our mobile app or online banking
- Visit any of our 6,800+ shared branches in 47 states and several countries
- Use over 35,000 ATMs nationwide with NO surcharges
- Manage all your financial accounts with FinanceWorks™

More Purchasing Power.
Looking for your first credit card? Consider the many perks of an MITFCU VISA® card including a low rate, simple terms, and no annual or hidden fees. You are also now eligible for our new MIT Alumni Credit Card. Take advantage of this exclusive Rewards card that helps to support the MIT Alumni Association and current student programs.

NOT A MEMBER YET? IT'S NOT TOO LATE!
All you need to become a member is a $5 deposit. Join today! Visit www.mitfcu.org or call 617-253-2845.

Don't forget! Before you leave, please remember to give us your new contact information.

NCUA
Federally Insured by NCUA.

MIT | PROFESSIONAL EDUCATION

CONGRATULATIONS CLASS OF 2013

Stay curious, keep learning, and build a better future.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

YOUR DOOR TO MIT EXPERTISE & KNOWLEDGE

TRAINING & EDUCATION FOR PROFESSIONALS

Come to MIT for a Semester

ADVANCED STUDY PROGRAM

Enroll in regular MIT courses through this non-matriculating, non-degree program. Participate on a full or part-time basis for one or more semesters.

As an Advanced Study Program participant you can:

- Advance your knowledge in the latest technologies and cutting edge research
- Learn from world renowned faculty
- Tailor studies to meet individual or company needs
- Choose from over 2,000 MIT undergraduate and graduate courses
- Earn grades, MIT credit, and a Certificate of Completion

NOW ACCEPTING APPLICATIONS FOR FALL TERM

Apply by August 1

Come to MIT for a Week

SHORT PROGRAMS

Register for a 2–5 day intensive course and gain critical knowledge to help advance your career and impact your company's success. Earn CEUs and a certificate of completion.

Each year approximately 40 courses are offered in a variety of subject areas (partial listing below):

- Biotechnology/Pharmaceutical
- Crisis Management
- Data Modeling and Analysis
- Energy/Sustainability/Transportation
- Enterprise Transformation
- Imaging
- Information and Communication Technologies
- Innovation
- Leadership/Negotiation
- Radar
- Systems Engineering
- Tribology

STILL ACCEPTING REGISTRATIONS FOR SUMMER COURSES

Bring MIT to You

CUSTOM PROGRAMS

Enhance your organization's capabilities and expertise through customized programs tailored to meet your specific needs and priorities.

INTERNATIONAL PROGRAMS

Find out about regionally relevant MIT short courses being offered in various locations around the world.

To learn more about what MIT Professional Education can offer you and your company, visit us today at HTTP://PROFESSIONALEDUCATION.MIT.EDU/2013CLASS or email us at PROFESSIONALEDUCATION@MIT.EDU.