Massachusetts Institute of Technology

Vol. XXVII No. 3
January/February 2015

# MIT Faculty Newsletter

http://web.mit.edu/fnl

in this issue we offer commentary on MIT's regular-season undefeated football team and the continuing discussion of the need for more grad student housing (below); "Why MIT Faculty Should Sign the Petition to Divest from Fossil Fuels" (page 11); and notes on the *Recommendations on the Future of MIT Education* (page 12).

2014 MIT Football Team

## The Current East Campus Plan Still Needs More Grad Student Housing

**Frederick P. Salvucci**

**THE EAST CAMPUS/KENDALL SQUARE** initiative as currently envisioned will adversely affect the graduate student body of MIT by making no serious commitment to deal with the existing and worsening graduate student housing crisis at MIT. Failing to make significant progress now on increasing the availability of affordable on- and near-campus housing for graduate students will undermine the long-term viability of the research and education missions of MIT. It will also detract from the reputation of MIT as a member of the Boston and Cambridge community if MIT misses the opportunity to secure the viability of its unique research-oriented approach to education, which has proven so valuable to the economy of the region, and simultaneously to mitigate the escalation of housing costs for the general Cambridge

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## A *Magical*, Almost Perfect, Season

**James H. Williams, Jr.**

**ONCE YOU EMBARK ON A PATH,** although you may have some fun and heartbreak along the way, among the most compelling questions you can consider is: "How will that journey, as all must, end?" All our journeys, great and small, will end, though the how is often within our control.

I am reminded of a recent trip to Las Vegas. After some 20 minutes of observing a row of one-armed bandits, each with its colorful blinking lights enticingly winking at me, I made my choice. As I slowly approached it with my roll of quarters in hand, my pulse quickened with anticipation. One quarter, two quarters, three, then four. Wham! The bandit rewarded me with the pleasant sound of falling coins into its collection tray: $5.00. I immediately quit. I could not construct a reason to continue. My journey was suc-

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## Editorial

## Articles; Faculty Demographics; Inclusion and Diversity Report; Black Lives Matter; Court Case; New Leadership

### Articles

**THIS ISSUE OF THE** *Faculty Newsletter* carries articles on an unusually broad range of topics:

- James H. Williams, Jr. on the MIT football team's success (page 1);
- former Massachusetts Secretary of Transportation Fred Salvucci on the East Campus Plan (page 1);
- Charles F. Harvey on divesting fossil fuels stocks (page 11);
- Mark Goulthorpe and Gregory Ulmer (University of Florida) on the "Future of MIT Education" report (page 12);
- Martin Luther King Jr. awardee Michel DeGraff on the MIT/Haiti teamwork on STEM learning materials in Kreyòl (Haitian Creole) (Page 14); and
- Meredith Peppin and Christopher Capozzola on aiding freshman to prepare for research (page 19).

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$25/year off campus

**Articles; Faculty Demographics; etc.**
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Please note that MIT faculty are always welcome to submit a letter or article in response, or to raise other issues.

### Faculty Demographics

The M.I.T. Numbers section on the last page of this issue shows the history of faculty growth. It is striking that the faculty has grown so little, in a period in which overall federal research funding and graduate and postdoctoral numbers have increased significantly, as well as overall administrative positions (see "M.I.T. Numbers," *MIT Faculty Newsletter*, Vol. XXV, No. 2). Since 1970, the student-to-faculty ratio has increased by 15%, and that omits the substantial increase in postdoctoral fellows over that period, who also require mentoring. Either an increasing number of undergraduates, graduate students, and postdoctoral fellows are receiving reduced mentoring, or the workload of faculty is steadily increasing.

The increase in female faculty and Hispanic and African-American faculty over the past decade is encouraging, but the actual levels are still deeply disturbing. With female faculty fewer than 25% of total faculty, and Hispanic and African-American both under 4%, MIT still has a long way to go. All members of the faculty and administration need to be working harder on these fronts. Prof. Bertschinger's report below may provide some support.

### Inclusion and Diversity Report

As this issue was going to press, Ed Bertschinger, the Institute Community and Equity Officer, released his report "Advancing a Respectful and Caring Community: Learning by Doing at MIT." The report has a cornucopia of recommendations, and we urge faculty to read it, in the interest of helping set priorities [***iceoreport.mit.edu***].

### Black Lives Matter

The mobilization that occurred in communities across the country in response to the killings of African-Americans engaged members of the MIT community. Such racial justice activism and the Black Lives Matter demonstrations touched many and perhaps took root again in the MIT community. We should follow up on this opportunity to foster meaningful change on the campus, using the Bertschinger report, and any other initiatives available.

### Court Case

At the same time as the completion of the Inclusion and Diversity report, news reports were published describing MIT's defense against a wrongful death suit brought by the family of graduate student Han Duy Nguyen, who committed suicide. MIT's lawyers requested dismissal of the suit, claiming that Nguyen's employment as a summer research assistant made him an Institute employee, rather than a student. The presiding judge rejected this claim, as inconsistent with MIT's prior positions that graduate students are not employees. This effort to reduce liability through a technicality is not appropriate for MIT, which aspires to provide leadership in higher education. We understand that lawyers are employed to limit liability of the Institute, but their actions need to proceed in a fashion consistent with the principles and values of the MIT community. MIT's Corporation and administration need to ensure that MIT's legal tactics do not compromise the Institute's broader educational, research, and cultural missions.

### New Leadership

During the past six months there have been new appointees to a significant group of MIT administrative leadership positions. They include (with their prior positions):

- Chairman of the MIT Corporation: Robert Millard, MIT '73;
- Vice President for Human Resources: Lorraine Goffe-Rush (Vice-Chancellor at Washington University in St. Louis);
- Director of Libraries: Chris Bourg (Associate University Librarian for Public Services at Stanford);
- Vice President for Finance: Glen Shor (Secretary for Administration and Finance, Commonwealth of Massachusetts);
- William Kettyle: Director of MIT Medical; has announced plans to step down but remain until a new director is recruited.

In addition, three major positions have been filled within the past year:

- Provost: Martin A. Schmidt (Associate Provost);
- Chancellor: Cynthia Barnhart (Associate Dean of Engineering);
- Vice President for Research: Maria Zuber (Chair of the Department of Earth, Atmospheric and Planetary Sciences). ■

**Editorial Subcommittee**

**A Magical, Almost Perfect, Season**
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cessful and complete; I had made 400% on my money.

Throughout the early fall of 2014, I played golf most Sundays with a standing foursome. At some point within each round, the latest exploits of MIT's football team became the focus of our conversation, victory upon victory. We hence agreed to meet as a foursome at the October 25th game; undefeated Western New England University (WNE) would travel east to meet the undefeated MIT Engineers.

MIT's remarkable 2014 football journey is what I really want to call to mind here, but before I continue, I shall explore a few of my thoughts about (male) American football. By most measures, football is the favorite sport in the United States.

### Football: Its Art, Discipline, Beauty, and Management

As a youngster, I witnessed the Baltimore Colts' distillation of the sideline timing pass (during which a receiver heads downfield; the quarterback throws the ball towards a point along a sideline; without looking at either the quarterback or the airborne ball, the wide receiver cuts towards that same sideline; the ball and the receiver arrive simultaneously at the same sideline location, completing a reception); the Green Bay Packers' perfection of the sweep (considered by many to be the most famous running play in the history of football); and the rushing of Jim Brown, the greatest running back in the history of the National Football League (NFL). Today's sport of football at all levels is an evolution of the achievements of those icons.

Professional football displays a beauty of coordination, complexity, strategy, power, agility, and speed that is unmatched by any sport. Much of this awe-inspiring beauty cannot be seen by a novice without the benefit of slow motion video.

I want to focus on collegiate football, initially on the Division III level (where students are not awarded scholarships to play) and then on the Division I level (where students are awarded scholarships to play and media networks pay hundreds of millions of dollars each year to regulating associations, colleges, and universities to broadcast the games). (Division II is intermediate, permitting athletes to finance their collegiate studies with a combination of educational and athletic scholarships.) At each level of college football, the game can be a vehicle for binding together all sorts of communities, united by academic, alumni, municipal, statewide, and national affiliations.

At the Division III level, the game is generally less powerful, with less speed, and thus ideally fewer injuries, than in the other collegiate divisions and the professional leagues. Nonetheless, the Division III game remains an entertaining exhibition to watch and can be a deeply educational experience to play.

At the **Division III** level, the game is generally less powerful, with less speed, and thus ideally fewer injuries, than in the other collegiate divisions and the professional leagues. Nonetheless, the Division III game remains an entertaining exhibition to watch and can be a deeply educational experience to play.

Football is the ultimate team sport and is defined by a complex set of rules governing primarily the physical opposing actions of two 11-man squads (and their reserves) on a field of play. An excellent team will quickly identify a weakness in an opponent and exploit it until it is repaired. To play football, dozens of young men – often of different ethnicities and backgrounds, radically different sizes and shapes, and diverse ranges of strengths and dexterities – must come together on a coordinated team, as they confront and overcome adversity together.

On an 11-man offensive squad, a single player's failure of his assignment can lead to a devastating loss of field position for his team; on an 11-man defensive squad, a single player's momentary miscue can lead to an opponent's score. To be a successful player, one must possess a short memory – to dwell on the humiliation of a missed tackle or a blocked pass that resulted in an opponent's minor success just seconds earlier can lead to a subsequent lapse of responsibility, resulting in a disastrous mistake and a defeat of one's team. For sure, every man has his individual assignment, but *football is about team*.

What could be more educational?

As I shall discuss below, I believe the governing National Collegiate Athletic Association (NCAA) has been negligent in ensuring fair play in Division III football competition. (Although I have specific recommendations for better ensuring fairness, I shall not discuss those suggestions here.) On the other hand and to its credit, the NCAA has begun to ramp up safety measures, perhaps most notably through penalties, including ejection from a game, against players who strike opponents above their shoulders with elbows, fists, forearms, and especially helmet-to-helmet collisions. And, as stated in my closing remarks, I am in agreement with the NCAA's philosophy that intercollegiate athletics between Division III institutions should "*Give primary emphasis to regional in-season competition and conference championships.*" [2014-15 NCAA Division III Manual, pp. 264, P.O. Box 6222, Indianapolis, IN, 46206-6222, August 2014.]

Turning to the **Division I** level, the same individual and team concepts and goals apply, but the players are generally stronger and faster than in the other college divisions. Division I colleges attract many of the top amateur athletes in the United States, and beyond. These amateur athletes are sometimes identified as early as the 8th or 9th grades, then later

as high school juniors and seniors they are nationally ranked, typically from 1 to 300, followed by intense recruitment by colleges and universities. Nowadays, even the announcement of a top prospect's choice of college is often televised. As collegians, these student-athletes are supervised year-round through weight and conditioning programs, and they often participate in "spring football" and summer camps.

Outstanding players in Division I are the prime prospects for the professional game. Further, the Division I postseason competition called "bowls," involves more teams than in Divisions II and III.

A couple of generations ago, playing in one of about 8-to-10 post-regular-season bowl games was an acknowledgment of excellence within Division I football, usually indicated by a superior won-lost record or a major conference title. The Division I football bowl season was focused around New Year's Day. Today, the Division I football bowl season has become an extended postseason, with the 2014 bowl season beginning on December 20, 2014 and lasting until January 12, 2015.

There are currently about 120 Division I football programs, and the 2014 postseason number of bowls has been pumped up to about 39 plus three all-star games. These numbers ensure that more than 70 of the Division I colleges receive bowl bids. A further consequence is that in recent years, some bowl-bound colleges have only mediocre 6-6 (or currently even worse) regular season records, while other colleges decline outright all bowl bids. In any case, it is important to note that the postseason involves multiple games in the format of playoffs for only four teams, as the remaining Division I bowl-bound teams play only a *single game*.

So, why has the number of college football bowls expanded so strikingly? Money. Division I college football is much about money. (The top coaches are paid more than $5,000,000 per year.)

Television contracts and the use of "naming rights" have become the sources of the money for a growing number of otherwise meaningless bowl games. For example, among many, the Peach Bowl became the Chick-fil-A Peach Bowl, the Orange Bowl became the Capital One Orange Bowl, the Cotton Bowl became the Goodyear Cotton Bowl, the Fiesta Bowl became the Vizio Fiesta Bowl, the Sugar Bowl became the Allstate Sugar Bowl, and the Rose Bowl became the Rose Bowl presented by Northwestern Mutual. Thus, many football fans are turning away from a nonsensical overload of bowl expansion, as both attendance and television viewing rates of bowl games decline. Additionally, I believe that some bowls may be forced into accepting teams with increasingly worse regular season records, and the current playoff system consisting of four elite teams will expand to eight teams within a decade. After all, the NCAA will likely inflate its cash cow.

But who will speak for the young men who are assuredly exposed to more injuries by the expansion of postseason football, which, except for the money, is largely aimless?

Notably, in 2014 the NCAA cartel experienced its first significant financial challenge in decades. In a legal action initiated by members of Northwestern University's football team, the National Labor Relations Board (NLRB) ruled that they were entitled to unionize, perhaps leading to salaries for college football players. That decision was based, in part, on the observation that on football activities alone, the players spent "*50 to 60 hours per week*" during training camp and "*40 to 50 hours per week*" during football season. The numbers of hours per week cited in this Division I case have implications for competition and fairness at the Division III level, as I shall observe below.

Thus, the task of finding enough students to play competitive intercollegiate football at MIT is immense. Even so, one of the distinctions of the Institute's undergraduate population is that this body of students is also the same pool that has produced the largest number of Division III Academic All-Americans in the history of collegiate athletics.

**The One and Only**

If you are a first-year undergraduate and want to study economics, linguistics, literature, political science, urban studies and planning, or writing at MIT, you must nevertheless take – or, perhaps I should say be grateful for the opportunity to take – freshman biology, calculus, chemistry, and physics alongside some of the world's future top engineers, mathematicians, and scientists. There are no "basket-weaving" subject offerings or scholarships for jocks at MIT.

Thus, the task of finding enough students to play competitive intercollegiate football at MIT is immense. Even so, one of the distinctions of the Institute's undergraduate population is that this body of students is also the same pool that has produced the largest number of Division III Academic All-Americans in the history of collegiate athletics. [In fact, my former research student (SB, SM, PhD) in 1979-80 became MIT's first Academic All-American.]

I suggest that anyone who has not visited the MIT Athletics homepage do so. Whatever positive feelings you may already have for our undergraduates, your respect for them will grow after visiting the MIT Athletics homepage. You may also better understand why during my years as a student and faculty member, I have attended hundreds of intercollegiate athletic events involving MIT undergraduates and I competed on dozens of intramural athletic teams (until I broke my leg playing softball for the New West Campus Houses in 1982).

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**A Magical, Almost Perfect, Season**
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I often write about our undergraduates who need to hear more often how much the faculty and administration enjoy observing their growth and want to support them in achieving their goals. Last month, I was chatting in the corridor – where many, if not most, important conversations occur at MIT – with a colleague who was so pleased with the dedication and intellectual development of the undergraduates in a demanding disciplinary subject in Mechanical Engineering. Last year, I wrote the following to a *senior* administrator, in response to a speech he gave: "In the daily hustle and bustle of MIT, our students' global perspectives, capabilities, and potential impacts can be easily submerged, and occasionally even lost. Thus, daring to positively change the world becomes an important message for them to hear . . . ." Our students are too sophisticated to be enamored with false compliments but, in what is too frequently MIT's no-praise culture, they need to hear the faculty's and administration's applause when they have earned it.

As the first housemaster of New House in the late 1970s, I witnessed several uniquely memorable events in MIT's history.

Throughout weekends during that period, oversized – and I do mean oversized – audio speakers in Burton-Connor and elsewhere along Dorm Row bathed Briggs Field in Chuck Mangione's "Feel So Good."

In 1978, the MIT Football Club was founded and joined the National Club Football Conference, with the team ultimately becoming a varsity program and a member of the NCAA Division III in 1987.

The MIT Marching Band was also formed in 1978. Although I never saw more than six or seven members at any single time, I found them to be musically skillful and cleverly resourceful as I observed them practicing on Briggs Field. The band had no uniforms, and several of its members bristled at *The Tech's* characterizations that they constituted a "spoof," employed "haphazard formations," and that their sundry shirts, shorts, and bell-bottom jeans were "random costumes." Nevertheless, applying both Gaussian and Lévy distributions, I tried to write a manuscript using statistical analysis to describe the band's marching formations, but my assumption of ergodicity was too constraining.

MIT's First Marching Band (1978)

On Saturday, October 28, 1978, the MIT Football Club played, but lost, its only home game that year. (Actually, the team lost all its games that year.) The game also served as a campus-unifying Homecoming during which the MIT Marching Band performed. Another highlight of that festive day was the appearance of the reigning UMOC (Ugliest Man on Campus) who, as the Homecoming Queen, rode into Henry Steinbrenner Stadium on his "chariot" (a decaying flatbed covered with cardboard, depicting the urging "Go Tech"), waggling his "scepter" (a wooden walking cane), and bedecked in the queen's pink cape and "crown" (part of a milk carton). I must confess: I adored him then and I have never forgotten him.

In 1978, MIT's student body was at its *sui generis* best!

**October 25, 2014: The Magical Season Takes Hold**

From the spectator stands on the north side of Henry Steinbrenner Stadium – there are no stands on the south side of the Stadium but there should be, as well as an updated press box, scoreboard with a modern video screen for playbacks, refreshments stand . . . – the towers of the Boston skyline rose above McCormick Hall and Baker House. The cloudless flat sky gave the appearance that anyone on the roof of McCormick could touch *at arm's length* the Hancock Tower and anyone on the roof of Baker could simply reach out and touch the Prudential Tower. The game's start time of 6 PM was ideal for the setting Sun to highlight the Boston skyline in tones of golden tangerine.

I was with my golfing buddies and the spouse of one of them. About a dozen current MIT students and recent graduates who were seated several rows in front of me at the beginning of the game gravitated toward me during the game. I would learn that at least one of them had studied from my dynamics textbook and that others had noticed my Brass Rat, which I had chosen to wear for the first time in some 20 years. As they left briefly for drinks and food, each time upon returning they would move a row closer to me until a steady conversation sprouted. They were relaxed, delightfully subtle, and respectfully reserved. We compared class rings – many people are unaware that each MIT class's ring is different – chatted about their MIT experiences and goals, and with a wry smile I asked humorously leading and pointed questions of

another whose parents I've known for years.

The football combatants were the only two undefeated teams in the New England Football Conference (NEFC): Western New England (6-0) and MIT (5-0). Throughout the game, MIT's quarterback, possessing a Division I arm and instincts, and MIT's halfback, capable of Division I bursts of speed, were at their best. In a highly entertaining, back-and-forth battle, MIT was leading at 35-28 as the fourth quarter wound down. Then, with 42 seconds remaining, Western New England scored a touchdown, bringing the score to 35-34, with a cocksure extra point in the offing to send the game into overtime.

Suddenly, two male students sitting a few rows in front of me said "Block that kick." Their encouragement to the MIT team immediately seemed like a good idea to me, so I stood up and joined them: "Block that kick!" Within another round of the shouting of the urging, a dozen people were whooping, then several dozen, and then what seemed like the entire MIT fan base – students, cheerleaders, faculty, alumni, parents, other relatives and visitors, two dogs with long flapping tongues deliriously running around in a circle in front of the stands; all of us, roaring – **BLOCK THAT KICK!** Then, the WNE center snapped the ball, and so it was: The extra-point kick was blocked. Many of us looked around at each other like six-year-old kids who had just witnessed a great feat of sorcery. Indeed, the undefeated MIT football season had entered the day as perfect; by evening, that perfect season had become *magical*.

### I'm Concerned: Five Games?

Following the Western New England game, a unique and signature sweep of Endicott College, Maine Maritime Academy, and the U.S. Coast Guard Academy took the MIT Engineers to a historic undefeated regular season at 9-0 and a first-ever championship of the New England Football Conference. MIT's prior best-ever showing in the NEFC had been 4-3.

The national print and broadcast media erupted with stories of MIT's football success, as MIT rolled into its first-ever appearance in the playoffs for the NCAA Division III Football Championship. I, too, was caught up in the national clamor, but when I learned that the playoffs consisted of a five-game, five-week-long, single-elimination tournament, I became concerned.

During the final game of the regular season against the U.S. Coast Guard Academy, with little effort, I was introduced to families and friends of MIT football players who had traveled from around the U.S. Seated within a row of me, I met family members from Colorado, Minnesota, and Oregon. Our interactions and chatty conversations were pleasant, but I could not convince them of the lamentable aspects of the extended playoffs. Still, I remained uneasy about MIT's forthcoming playoffs that, if the team continued to win, could reach five games – more than 50% of the regular season would be added onto a completed regular season, comprising a postseason that would be five times as long as the postseasons of nearly every Division I football program.

Was MIT's philosophy of academics-and-athletics being stretched and flipped upside-down by participation in the playoffs? A brief viewing of the 2014 playoff schedule commingled with MIT's academic calendar, for games that would require multiple hours of bus riding and some overnight trips for the MIT football team, should illustrate a portion of my concern:

* **Playoff Game No. 1:** November 22
*MIT's Thanksgiving Vacation:*
*Thursday and Friday – November 27, 28*
* **Playoff Game No. 2:** November 29
* **Playoff Game No. 3:** December 6
*MIT's Last Day of Classes: Wednesday - December 10*
* **Playoff Game No. 4:** December 13
*MIT's Final Exams: Monday-Friday December 15-19*
* **Playoff Game No. 5:** December 19

The scheduling of the NCAA Division III Football Championship playoffs not only forced the loss of Thanksgiving with families and hometown visits, but also indicated a potentially major interruption of academic time during final exams. MIT football players, if they continued to win, were facing dismaying personal and academic disruptions. Missed classes, late assignments, and make-up exams would place unprecedented burdens on students and professors who might feel obliged to create alternative assignments and examinations.

Would the athletic tail be required to wag the academic dog? Many people not aware of MIT's academic intensity might wonder what's the problem; many people on campus would shudder at the crushing burden on the team in MIT's academic pressure cooker. Could cheering members of our campus and fans elsewhere have foreseen such a burden?

Privately, I also could not shake the thought that the reward for each playoff victory would be an increasingly more talented and more physically imposing opponent, and an increased likelihood of injury. For the two weeks following the U.S. Coast Guard Academy victory, in muted expressions I repeatedly voiced my angst to my golfing buddies.

### MIT's NCAA Division III Football Playoffs Begin

MIT's first game in the 2014 NCAA Division III Championship playoffs versus Husson University was a thriller in Bangor, Maine. In a fierce, seesaw donnybrook, dominated by defense, MIT's star linebacker ruled and roamed throughout the Engineers' defensive squad, delivering disruption and torment to the Eagles all over the field.

Leading by a score of 17-14 late in the fourth quarter, MIT yielded a touchdown to an impressive 84-yard drive by Husson, giving the Eagles the lead at 20-17. Then, just like the magical ending in the Western New England game, MIT blocked the extra-point attempt, leaving the score at

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what would prove to be a crucial 20-17, in favor of Husson.

After an exchange of ball possession by each team and several judicious seconds-saving timeouts by MIT, the Engineers' final custody of the ball was at hand.

Trailing by a score of 20-17, with no timeouts, with just 48 seconds on the clock, and inside its own 30-yard line, MIT marched down the field using time-preserving sideline passes and quarterback spikes of the ball. Then, with 18 seconds remaining in regulation – it's a bit difficult to know the precise remaining time because the scoreboard clock had just broken, and the time was being kept on the field by a referee, most properly the side judge – (1) MIT completed a pass down to Husson's 21-yard line whereupon (2) the MIT field goal unit sprinted onto the field and (3) kicked a 38-yard field goal to tie the score, sending the battle into overtime.

That coordinated use of *18 seconds* is the most outstanding example of coaching, preparation, and precise execution that I have ever witnessed in a collegiate football game, at any level.

In overtime, with the ball some 14 yards from the goal line, MIT's precision pass and spectacular touchdown reception – from the shotgun, the quarterback rotated leftward and faked a handoff to the scooting halfback as he carried out the fake into the left flat as both a potential blocker and receiver; while again facing the line of scrimmage, the quarterback slid two sidesteps to his left, dipped toward the ground and pirouettéd 270°, then ran nine steps toward the right-hand sideline, delivering the ball on the run toward the right-rear corner of the end zone but beyond the right-hand outer-bound sideline edge of the end zone; as the wide receiver, with his feet inbounds but much of his upper torso extending over the edge of the sideline of the end zone, pulled the ball in towards his body while securing the catch – were nearly anticlimactic in a 27-20 win, except that they elevated the Engineers' season record to an all-time notable 10-0 and marked the first NCAA playoff victory in MIT's football history.

### MIT's NCAA Division III Football Playoffs End

Shortly after the completion of The Star-Spangled Banner, the Wesley College Wolverines were up by the score of 28-0. On one of the after-touchdown kickoffs, the MIT halfback, who had displayed quickness and grit throughout the season, especially during MIT's victory over Western New England, resolutely gathered himself and headed upfield. When he encountered the charging Wolverines' kickoff team, the MIT return specialist absorbed a numbing blow – the kind of hit that causes the fillings in one's teeth to ache – that seemed to destroy the starch in his spirit, though after slowly walking off the field, he stiffened and played on. He had exhibited a rare ingrained toughness.

At the line of scrimmage, other MIT running backs were treated equally harshly as the game proceeded, absorbing blow after numbing blow, quantitatively beyond any I had observed all season. The tenacity of Wesley's defensive linemen and blitzing linebackers did not permit MIT's quarterback a second or third option of receiver when he dropped back to pass, as he had so deftly and instinctively during the regular season. The quarterback was allowed a quick first option, if that, and then the choice of a sack or a scamper to a sideline.

I ached emotionally as I lamented the psychic and athletic humbling that our MIT players must have felt; but they valiantly played on. Though gaining only 11 yards in the third quarter, the MIT team began to generate a second wind of dignity and purpose. And, as the game unwound to a close with MIT driving down near the Wesley goal line, they sustained a quarterback sack. Even so, on fourth-and-long and still scoreless, they chose to go for a touchdown instead of a cinch, goose-egg canceling field goal. No score.

Especially in basketball and football, there is a subtle line of honor and grace between avoiding a loss and seeking a victory. Further, meaningless point-gathering is vulgar, likely to precipitate hard fouls and fistfights in professional sports. (Intently observe the players' behavior during the final few seconds of an NBA or NFL game that is not close. Most fans simply see the players as, milling around, accepting the game's result; but the players are, in fact, engaged in a ritualistic and mutual respect of a time-honored code, which among other things, detests the vulgarity of vain point-gathering.) MIT's display of class – in going for the touchdown though well within field goal range – was an affirmation of that code and so significant to me that the pain I had felt during the game was overcome by intense emotions of respect and pride. Game over: 59-0.


2014 MIT Football Team in Action

Defeat has its lessons. I was sad.

Within minutes of the end of the game, my admiration for the MIT football team yielded to a sense that the landscape of the playoff system called the NCAA Division III Football Championship was hugely uneven, and thus enormously unfair. I wanted to know more about the teams that were participating in those playoffs.

### Who Are Those Footballers?

In preparation for the 2014 NFL draft, four Wesley College players were cited by ESPN analysts as NFL draft prospects. Though Wesley is one of the top Division III football programs, it did not have an undefeated 2014 regular season, and I do not believe it is one of the elite Division III football programs. On the other hand, the University of Mount Union, which had an undefeated 2014 regular season and which won games by delivering beatings of 75-0, 74-7, 67-0, 67-7, 63-0, . . . , is elite. In fact, except for the year 2004, Mount Union has been in every NCAA Division III Championship *final playoff game* since 2000.

In a football game with such hugely unequal scores as just cited, the winning team does not simply defeat the losing team; the loser often takes a psychological and physical beating and faces a recovery period of days or weeks or longer. Football is different from nearly all other team sports in that lopsided competition often involves both a psychological and a physical *beating*.

The best of the elite Division III football players are likely looking forward to prospective NFL occupations – not engineering, management, or science careers, perhaps as future corporate executives, entrepreneurs, or academicians.

For example, former Mount Union players who are currently on 53-man active NFL rosters (with their 2014 salaries and teams) include Kyle Miller ($480,000 with the Atlanta Falcons), Cecil Shorts ($739,383 with the Jacksonville Jaguars), and Pierre Garçon ($5,600,000 with the Washington Redskins), not to mention Mount Union alumni among the ~250 players on NFL practice squads. (If the reader responds better to photographs than text, take a look at four recent Mount Union players who signed free-agent NFL contracts: [***http://athletics.mountunion.edu/sports/fball/2012-13/releases/20130427w025ha***].)

And, just in case you are wondering, Mount Union has played Wesley only four times (initially in 2009 and all in the Division III playoffs), winning all four games. In fact, on December 13, 2014 in a semifinal game of the Division III football playoffs, after three quarters, Mount Union led Wesley by the score of 70-0 and then chose to use large-scale substitutions of its reserves, ultimately winning by 70-21.

2014 MIT Football Team Takes the Field

*If* MIT had defeated Wesley and continued to win, it would have likely met Mount Union in the draw of the 2014 football playoffs.

### By What Rules?

During the 2014 football season, MIT's team nominally practiced during an Institute activities period from 5 to 7 PM each weekday. Having read the 2014-15 NCAA Division III Manual's bylaws governing football activities, such as permissible hours of in-season practice, I believe MIT's compliance with those bylaws has been exemplary and securely within MIT's philosophy of student-athlete; that is, student:first-athlete:second. Further, the other Division III colleges and universities that have been mentioned above do not appear to be in violation of the NCAA bylaws governing in-season practice. So, there appears to be no "bylaws" scandal on the matter of in-season practice.

The primary reason for this apparently broad compliance, however, is that the NCAA bylaws are disturbingly lax on the question of in-season practice hours, permitting practices six days per week with effectively no additional quantitative constraints. Thus, there is a leniency that produces both (i) broad compliance due to a lack of quantitative guidelines and (ii) an uneven playing field due to the fact that protracted football practices are academically undesirable for undergraduates who take seriously the responsibilities of being both a student and an athlete. So, in essence, there exists a six-day per week chaotic free-for-all. Thus, according to the NCAA bylaws, the cumulative weekly in-season football practice hours for Division III programs could resemble anything from the equivalent of a long day to a long week, where the quantitative measure of a long week was cited earlier in the NLRB Division I unionization case.

Although no athletic scholarships may be awarded to play football, permissible full "cost of attendance" under NCAA Division III bylaws includes a broad range of financial assistance including, for example, employment, gifts, grants, other scholarships, professional sports stipends, tuition waivers, and welfare.

Moreover and of crowning significance, the fundamental *de jure* and *de facto* questions concerning the eligibility of a specific college or university for competing under the Division III classification need to be clearly asked and clearly answered. The NCAA's current definitions

continued on next page

**A Magical, Almost Perfect, Season**
Williams, Jr. from preceding page

and rules regarding these questions are so generic and devoid of specifics that they are virtually useless.

On December 19, 2014 – both the last day of MIT's final exams and the day of the finals of the Division III football playoffs – the University of Wisconsin-Whitewater won the NCAA Division III Football Championship by defeating the University of Mount Union, 43-34. The University of Wisconsin-Whitewater has an undergraduate enrollment of about 11,000 and is a member of the University of Wisconsin System. (Recall that the University of Wisconsin-Madison has a Division I football program and on December 6, 2014 played The Ohio State University for the Big Ten Football Championship.)

There are about 245 Division III varsity football programs in the United States. Notably, in the concluding games of the past decade for the NCAA Division III Football Championship, 9 out of 10 of those playoff finals were contested between the University of Mount Union and the University of Wisconsin-Whitewater. And, by the way, that "1" remaining playoff final was won by Mount Union.

And this is all being done out in the open!

**Let Our Students Define Their Journey**

MIT's 2014 football season was historic in so many ways: first undefeated regular season; first-time champion of the New England Football Conference, first-time invitation to the playoffs of NCAA Division III Football Championship, and first-time victory in those playoffs. Consequently, the team earned a lot of hardware and awards. A few of the notable awards include: Two academic All-Americans and a first-team All-American; NEFC offensive player of the year, NEFC senior scholar-athlete of the year, NEFC offensive lineman of the year, and NEFC defensive rookie of the year; nine additional students won All-NEFC position acknowledgment (including a dominant linebacker and an impressively reliable place-kicker); four honorable mention All-Americans; and NEFC coach of the year, Region 1 coach of the year by the American Football Coaches Association, as well as the New England Football Writers College Division Coach of the Year Award.

The team also earned immense respect and admiration from thousands of MIT students, faculty, administrators, staff, and alumni. The team was classy and talented, tough-minded and well coached.

I shall always be grateful for the 2014 MIT football team and its coaches who gave this campus (and beyond) a *magical* season. Through their skills, dedication, resilience, and wizardry, they inspired and entertained fans across the country, though some of the media coverage – MIT football: 10-0, at one point – was in the novelty category of man-bites-dog. I shall continue to support our athletic teams, as I hold on to the dream that our football team will someday earn another undefeated regular season, and far more, in health and happiness. The 2014 season will not be easy to repeat. That football team was rich in experienced senior all-star leadership, so any expectations of a repeat or improvement on the 2014 record should be undertaken prudently.

During the MIT-Wesley College game, I was upset by some of the physical (and psychological) blows delivered to MIT players. Yet, by the end of that game, I had gathered myself to an even deeper respect for the MIT players due to the pride and toughness I witnessed in them. But, I have not, cannot, forget the grievously uneven terrain on which they competed.

These are my students – literally and figuratively – even though I have never met most of them. But I have met a number of them (a wide receiver, a defensive back, three offensive linemen, a defensive lineman, and a linebacker) who in 2012 were among the 150 students in a dynamics subject using my textbook and who by their rousing rock-star-like ovation of me gave me chills and moist eyes. I know them all metaphorically through my myriad lectures, tutorials, lunches, athletic competitions, advisements, supervisions, and collaborations. And, I want to believe that the next time any of them absorbs a blow on a football field, that hit will be delivered fairly and by a just competitor, not someone seeking scalps on his journey to playing football on Sunday television.

If the MIT football program were in my control, I would remain in the New England Football Conference, but I would decline to participate in the playoffs of the NCAA Division III Football Championship; at least, until the NCAA had made significant efforts toward fairness and continuing progress toward safety. But such control is not mine; I neither want it nor have I earned it. In my opinion, this is a decision that belongs to the students on MIT's football team, and I hope they will thoughtfully consider it. As an engineer who has studied forces for decades, I believe it is generally more satisfying to pull back than to be shoved back.

I hope the members of the MIT football team will be wary of any avenues that others have assigned for them, and recognize when they have arrived at the destinations they have sought along the paths they have chosen for themselves. MIT students have historically set their own goals and paths, many of which have been created and defined by their laid-back intelligence and mellow wit.

Perhaps the members of the MIT football team should choose a different path from their 2014 journey: A path with the possibility of a New England Football Conference championship, Thanksgiving with families and friends, and sufficient unhurried academic time for the intellectual reflection and achievements they contemplated when they chose to come to MIT.

Oh yes, if the cost and benefit are known, there will always be a jackpot that may be worth pursuing; but sometimes, 400% ain't bad.

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# Why MIT Faculty Should Sign the Petition to Divest from Fossil Fuels

**Charles F. Harvey**

**I SIGNED THE PETITION** for MIT to divest from fossil fuel companies. Few other MIT faculty members have signed – 50 as opposed to the 300 at Stanford – so I was curious to hear my colleagues' views about divestment. Of the faculty members I spoke with, not one argued that it is important for MIT to invest in the fossil fuel industry, and all agreed that carbon emissions are a serious risk to the planet. A few worried about the hypocrisy of signing a fossil fuel divestment petition when they are personally responsible for disproportionately large carbon emissions, largely from flying, sometimes to greenhouse gas conferences. But the predominant reason I heard for not signing was a cool cost-benefit analysis.

The calculus goes like this: "Regardless of my actions, the Corporation will not allow MIT to divest and, even if MIT did, it would have a negligible effect on the industry and carbon emissions. But, of course, there is risk in taking a position that may be at odds with the administration." This analysis was usually followed by a knowing aside like: "Look, the financial mechanics of a step towards divestment are not hard; we've done it before. If we were really smart we would have sold before oil prices plummeted! But, let's be realistic – we often hear that another oil company has bought a relationship with MIT; David Koch funds the groups that push disinformation about climate science and he is a lifetime member of the MIT Corporation. I'd be spitting in the wind."

I certainly have no idea how the divestment decision will ultimately be made and I am optimistic that worries about personal repercussions are paranoid. But I must admit that my colleagues' analysis is good as far as it goes. Their dispassionate analysis fairly balances their assessment of an infinitesimal benefit against a small risk.

MIT derives tremendous value from its reputation for integrity and scientific excellence and, as a result of that reputation, MIT has the credibility to educate a broad spectrum of the populace on issues that involve science and engineering. . . . What better way to educate the public, let alone our own students, about the effects of carbon emissions than to follow through on the clear implications of our own research on our own investments?

So why did I sign the petition? I signed because the analysis above misses a key aspect of MIT's mission, an important way that MIT faculty could benefit the world. MIT derives tremendous value from its reputation for integrity and scientific excellence and, as a result of that reputation, MIT has the credibility to educate a broad spectrum of the populace on issues that involve science and engineering. According to MIT's Mission Statement: "The Institute is committed to generating, disseminating, and preserving knowledge, and to working with others to bring this knowledge to bear on the world's great challenges." We know the science of climate change, but many Americans are confused, if not badly misled. What better way to educate the public, let alone our own students, about the effects of carbon emissions than to follow through on the clear implications of our own research on our own investments? Divesting from companies who remove coal and oil from underground is consistent with our knowledge of climate change – fossil fuel companies must leave most of their reserves, their assets, underground if we are to avoid serious alteration of the climate. If a majority of the faculty sign the petition it would convey the scientific consensus about climate change. The divestment petition is an opportunity for the faculty to display leadership, to act according to MIT's mission. This remains true even if you believe that the MIT administration is locked into a relationship with the fossil fuel industry that prevents divestment; even if oil companies fund a graduate student of yours, as is now the case for me; even if you are responsible for releasing tons of $CO_2$ into the atmosphere when you fly to Asia, as I do, and will continue to do.

To sign the petition and for additional information: ***www.fossilfreemit.org.***

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# Advising the Tyrant of Syracuse* Notes on the *Recommendations on the Future of MIT Education*

**Mark Goulthorpe**
**Gregory Ulmer**

**IN THE NOVEMBER/DECEMBER** issue of the *MIT Faculty Newsletter*, two related articles appeared: "The Future of MIT Education," by Sarma/Wilcox/Ruiz, and "Issues Considering the Future of MIT Education," by an Editorial Subcommittee, Choucri/Flowers/King. These both reflect on the *Recommendations of the Task Force on the Future of MIT Education* by Sarma/Wilcox/Ruiz from summer 2014. Each article suggests that educational methods at MIT (and elsewhere) should evolve to offer more effective learning in line with emerging patterns of social and technical change, and as such, each text tacitly offers a *theory of method(s)* for new education.

Tacitly, since neither article offers a cogent position (contrast/target), nor a framing (theory/analogy) as to why such changes might be needed now, or effective post-now. [These elements, captured in the acronym CATTt – contrast, analogy, target, theory, tale – seem to occur in all effective historic calls for new education, from Plato's *Phaedrus* to Breton's *Surrealist Manifesto*: their prospective manner does not escape the need for structure.] The *Recommendations* then seemingly defer to the establishment of an *Initiative for Innovation in Education* as a forum for thinking through future education. But even this merits considerable reflection if it is to be prescient and effective, since it would be historically novel to do this *intra muros*. [Plato established his Academy *extra-muros*; Socrates was expelled and executed *extra-muros*; empirical Renaissance science, considered heretic, was established in café's via private funding, even the later Royal Societies being separate "protectorates" outside accepted schooling; and the C20$^{th}$ avant-garde emerged in bohemian Montmartre and Zurich's *Cabaret Voltaire* to counter established cultural institutions: the norm in each case being experimentation *extra-muros*.]

Both articles also seem largely directed to *scientific education*, perhaps without meaning to be exclusive; but this also seems at odds with MIT's thoughtful balance of science and humanities, as well as to current social and intellectual changes; so these notes offer a humanities' framing of issues and a prompt for further debate.

The *Recommendations* refer back to prior changes in pedagogy at MIT as sanction, each occasioned by shifts in the *technical context*: MIT's industrial-era founding as a hands-on technical research institute, its re-focusing post WWII to re-orient its technical specialism to embrace the humanities, and again in 1996 to respond to the influence of digital media. The current *Recommendations* focus particularly on *online learning*, implicitly suggesting that current change is motivated by a similar shift in technical *apparatus*. To invoke "apparatus" is to situate the *Recommendations* within the history of socio-technical evolution: "apparatus" seems a better term than "technology" as it implies (French) Apparatus Theory that considers the full social/intellectual/ideological dimension of any technical system: an alternative to technological determinism. The invention of literacy in Classical Greece included not only alphabetic writing, but the institution of *the school* (Plato's *Academy*, later Aristotle's *Lyceum*, in which were created *the practices of alphanumeric reason*); and within the larger culture the formation of a new identity habitus of *individual selfhood* and the *democratic state*. In other words, the "apparatus" of literacy was a fully *social condition*, engaging all the dimensions of a civilization (intellection, personal identity, sociopolitical structure).

Alphabetic writing emerged within an oral apparatus, with people organized in tribes, constructed individually as spiritual beings, and with reality and *atë* (fate) managed by invocation of gods. Literacy introduced a different metaphysics: Plato's *Phaedrus*, the first *theory of method* for (new) education, introduced the practice of *dialectic* – analysis and synthesis – breaking down the phenomenal world into elementary (recordable) word/concept units that could be rationally re-ordered. The Greek information explosion produced by writing (they transcribed the entire oral tradition, beginning with Homer's epics) divided complex reality into discrete areas of "topical" knowledge. Philosophy was the first discipline, created to engage with a material account of reality: Plato/Socrates/Aristotle *invented* all aspects of a literate ontology, *inventio* and *memoria* being techniques for applied textual knowledge. [*Inventio* used "commonplace books" to copy citations, students arranging them topically for ease of reference; *memoria* was then a technique of information retrieval, using a familiar scene or route and assigning elements of *inventio* to it, such that a rational discourse could be constructed in what was still an oral agora or law court. These educational methods remained intact until the advent of the printing press when "the book" became less sanctified, and living memory was relieved of its burden by ready access to a vast new repertory of available information – the book *before* the lesson, as it were.]

Descartes and Bacon re-aligned this ontology to suit print media, giving birth to modern science and empiricism, and ushering in not only new education but new individual and socio-political identity (secular education, autonomous thinking, the nation state) – the apparatus of the

print era. [Luther's *Bible*, printed in vulgate, allowed access to the scriptures by everyman, and together with novels such as Cervantes' *Don Quixote* and Dante's *Inferno*, written in Spanish and Italian, respectively, so the federated Papacy was profoundly challenged in ideological, social, and political registers.]

MIT (and the university in general) is the heir of 2500 years of literate intellection, modified to suit mechanical reproduction, but now arriving at the limit-point of literacy as we engage *electracy* and the apparatus of digital media. Alphanumeric schooling perfected *analysis* that disassembled reality into a logical order; but it was unable to accomplish synthesis, which is the implicit challenge of the emerging paradigm. The structure of discrete disciplines is virtually helpless when confronting the complexity of the world as networked "ecology" (to use the metaphor of the Task Force). An education for the future must address the second dimension of dialectic – *synthesis* – to invent a *unified field of learning* native to an electrate apparatus in the full sense of the term (technology, institutions, identity – individual and collective). Electracy is not another name for "media literacy," any more than literacy is another name for "alphabetic orality."

The challenge posed by apparatus history to any education reform is that the ground of our familiar world is undergoing mutation: not only technology, but also school, science, personhood, political institutions: all transform. If considering how to adapt learning to a digital apparatus does not produce discomfort, then the conditions of change have not been fully grasped. Electracy dates from the beginning of the industrial period, including all the registers of the era of "revolutions" – technological, political, and representational. Apparatus theory allows us to frame what is at stake by tracking the profound influence of each media invention: orality, concerned with right/wrong (religion), eventually put speaking into writing, opening the way for rational problem-solving and science; literacy, concerned with true/false (science), invented logic, and recently put this into computing, opening the way for (conjecturally) *an entirely new cognitive/social paradigm*. Digital computing mutates literacy as alphabetic writing mutated orality, and leads to the implication: *native electracy is beyond science, if not beyond school*. Polytheistic religion adapted to literacy, resulting in the monotheistic religions of the book; science is adapting to electracy in producing schools of the computer, but risks becoming the Church of Science, antagonistic to an ontology native to electracy.

It is important to keep in mind that while apparatus shift is inevitable, the inventions themselves are not determined. It is possible but not inevitable that school be superseded by the entertainment corporation as the primary institution of learning and (even) credentialing in electracy. Electracy does not replace orality and literacy, but supplements them in opening a new dimension of human development. Electracy does not entail a different science, but a different civilization that includes science and religion in a transformed worldview. The challenge and opportunity is to imagine the *learning/education* most adequate to *the social/political apparatus of electracy*.

Gregory Bateson, describing a new "ecology of mind" based on meta-patterns, encapsulated the past two millennia in a pair of terms, covering the two apparati: *sacrament* and *entropy*. Electracy introduces a third term, *enjoyment*, in the sense of "usufruct," the right to usage, having in mind collective well-being, a *right* to enjoyment of one's full *capabilities* as a human being. "Enjoyment" in apparatus theory assumes that the dimension of reality made accessible to education by digital media is *human embodiment* (libidinal energy). Human desire in the previous apparati was suppressed, sublimated, or suspended, but conditions for its full multi-sensorial engagement are now actualizing.

The digital apparatus addresses this opportunity by enabling a new integrative relationship among human capabilities, first suggested by Kant in his promotion of aesthetic judgment as mediator between scientific reason and moral freedom at the start of the industrial era, extended by Freud in his articulation of the Unconscious as the dimension of the unknown now open for inquiry. The Unconscious is nothing mystical, but a convenient label for everything that still resisted the best efforts of the entire apparatus of literacy (school, science, reason). The addition of heuretic (inventive) discovery to hermeneutic (analytic) verification in the curriculum of disciplines proposed by electracy in practice is a shift from *understanding theses* to *undergoing theopraxesis* (thinking/doing/making). The interdependence of Kant's three critiques and the central role of aesthetic judgment in a mass-media society, is directly relevant to imagining *theopraxesis*: the synthesis that electracy adds to literate dialectic, in other words, begins in *the practices of the learner*. This holism of intellectual virtues includes the generalization of "design" to all areas of education and society, constituting the "writing" of electracy. The alignment of features shared by digital imaging with logics of creativity constitutes a point of departure for a reconfiguration of education as the interface relating mind-body with culture and nature.

We suggest that a framing of the issues of educational change in orality, literacy, and electracy (per apparatus theory) would be a productive way to frame an *Initiative for Innovation in Education* at MIT (even its naming). Beyond an analytical framing, electrate pedagogy might (already) be explored *inventively*.

*Plato travelled to Syracuse with the hope of introducing rational justice to the philosophically-minded tyrant Dionysius, but fled fearing for his life and with his friend Dion banished for conspiracy.

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Editor's Note: For a more extended essay on this subject, please visit: ***emeragency.electracy.org/group/electracy.***

# Comments on My Acceptance of the MIT Martin Luther King Jr. Leadership Award

**Michel DeGraff**

*February 5, 2015*

**I AM FROM HAITI.** In Haiti, when we enter a room and greet our audience, we say, in Haitian Creole, "Onè," which means that we honor each and all of you in the audience. And in response, the audience responds "Respè" as a show of respect. So let's all give it a try: "Onè . . . Respè . . ."

Now I'd like to say "Mèsi anpil!" (i.e., Thank you very much!) to the organizers of this beautiful lunch. Thank you as well to MIT for this long tradition, which started long before we had a national MLK Jr. Day. In this tradition, we at MIT celebrate Martin Luther King Jr. with both words and actions. I would also like to thank the anonymous colleagues who nominated me and who wrote letters on my behalf. I also thank my MIT department, Linguistics and Philosophy, and the School of Humanities, Arts & Social Sciences. And I especially want to thank my MIT-HAITI team. We are a pretty large group across all of MIT: from MIT Sloan to Linguistics to the School of Science, the School of Engineering, the Office of Digital Learning, the Teaching and Learning Lab, etc., developing, evaluating and disseminating state-of-the-art educational tools and methods for Haiti, in collaboration with faculty colleagues in Haiti and the leaders at Haiti's Ministry of National Education. I'll soon give you some historical background on these efforts, which live up to the spirit of Martin Luther King Jr.'s legacy that we are celebrating today. But before that, I'd like to insist that without our MIT-Haiti team, I could not have gotten this award. This award is not mine, it's OURS: it's an award to our teamwork, teamwork with amazing colleagues at MIT and in Haiti who so strongly believe that together we can change the world as we confront a formidable global challenge.

In Haiti today, most Haitians are excluded from access to quality education and from the means to create and transmit wealth. Indeed most laws and decrees, most written press, most textbooks, most official exams are written in ONE language (French), which the vast majority of Haitians do NOT speak.

"One dream can change the world." This is the tagline of the inspiring movie *Selma* about Martin Luther King Jr., which I saw recently.

Toward the beginning of the film, there's one haunting scene, from the early '60s before the Voting Rights Act. That scene highlights Ms. Annie Lee Cooper, played by actress Oprah Winfrey. For many years, Ms. Cooper has been trying, in vain, to register to vote in Selma. On her fifth attempt, her application is again rejected. Why? Because of yet another totally artificial barrier: she's being asked by a white clerk to recite the names of all the 67 county judges in Alabama! Obviously, she cannot. Who could?

In Haiti, such barriers to full citizenship are even more brutal, and have been entrenched through language and education throughout the history of the country, all the way back from the colonial period when much European wealth depended on the work of enslaved Africans. Back then, our African ancestors were treated as beasts of labor not as minds to be educated. In Haiti today, most Haitians are excluded from access to quality education and from the means to create and transmit wealth. Indeed most laws and decrees, most written press, most textbooks, most official exams are written in ONE language (French), which the vast majority of Haitians do NOT speak. Yet most everyone in Haiti speaks one language in common: Haitian Creole ("Kreyòl") the language in which we just said "Onè... Respè."

This linguistic barrier has been so entrenched in the Haitian psyche that one can call French in Haiti, a linguistic "bluest eye" – to borrow a phrase from writer Toni Morrison. Too many Haitians, unlike Annie Lee Cooper in Alabama in the '60s, have been socialized, from birth, to accept this social injustice: they have learnt to accept that if they don't speak French, it's their own fault and, as such, they do not deserve anything better than second-class citizenship and the pit bottom of one of the worst levels of socio-economic inequity in the world. The Kreyòl phrase "Nou pa moun" is a frequently heard complaint from those who speak Kreyòl only: "We are not human beings." Fortunately, there are many Haitians who have enough clairvoyance and dignity to deeply believe in this Haitian proverb: "Pale franse pa vle di

lespri," which means "That you can speak French doesn't mean that you're intelligent." Another popular Kreyòl phrase is: "Sispann pale franse" (literally: "Stop speaking French"), which, tellingly, means "Stop obfuscating!"

As a linguist and educator, I know that in order to learn a language, ANY language, you have to get adequate input from that language – ideally, be IMMERSED in that language from a tender age. In Haiti, most Haitians, from birth onward, are immersed in ONE single language – Kreyòl. The status of Kreyòl as Haiti's sole national language and a unifying factor across all social classes is a robust fact and a linguistic asset. As for French, only the upper social classes, some three to five percent, speak it at home on any regular basis. Given these facts, plus what we know about the role of the native language in education, Kreyòl stands at the ready to be used as a powerful tool for nation building and economic development. Yet, there's a widespread entrenched belief that those who speak Kreyòl only are somewhat deficient, that Kreyòl is a lesser language, a language that CANNOT be used for science, for math, for the law, in written press, and so on. This linguistic apartheid has been encoded deep in the DNA of Haitian society, from the birth of the Haitian nation in 1804 – even as our enslaved ancestors were liberating themselves from French colonial chains. Today, still, Haitian minds are shackled in neo-colonial linguistic myths.

So, in effect, Haiti is still very far from Martin Luther King Jr.'s dream. But the MIT-Haiti Initiative IS dismantling these age-old barriers that have been implemented through language and education. And the Haitian government is playing its valiant part, collaborating with MIT in this historical struggle for social justice (***youtu.be/tWGw1gsGXg4***) and we now have, since December 2014, an official Haitian Creole Academy to promote the use of the language in all sectors of society. We are at the point that we can now reasonably hope that these barriers are indeed crumbling.

In 2010, Dr. Vijay Kumar (Office of Digital Learning) and I launched the MIT-Haiti Initiative (***haiti.mit.edu***) with support from the Foundation for Knowledge & Liberty, the Wade Foundation, the Open Society Foundation and the National Science Foundation (***1.usa.gov/1vvu75s***), and in collaboration with faculty and administrators in Haitian universities and Haiti's Ministry of National Education (***bit.ly/1yQL5ac***). This MIT-Haiti Initiative has been opening up education in Haiti through educational technology and through Kreyòl. We've been producing and testing, for the very first time ever in history, high-quality (MIT-quality!) digital tools for active learning of Science, Technology, Engineering and Mathematics (STEM) in Haitian Creole – with an initial focus on physics (***bit.ly/16xCmSN***), genetics, and biochemistry (***bit.ly/1zmKH6Z***) and differential equations, statistics, and probability (***bit.ly/1Kx5vKU***). As of now, we've worked with more than 200 university and high school STEM faculty and government officials in Haiti. We're also showing that kids who learn to read and write in Kreyòl learn three times better than kids who learn in French – which is not surprising in light of what we linguists know about the language-immersion factors that we just sketched and about the role of the native language in education (***bit.ly/1reddWz***). And in 2014 and at the request of the Haitian government, the MIT-Haiti Initiative in collaboration with MIT Sloan Executive Education organized for Prime Minister Laurent Lamothe and his cabinet (some 50 high-level officials) a workshop on leadership and teamwork – all of that in Haitian Creole (***bit.ly/1vGWYPs***). So now, all the available evidence points to an irrefutable, if "unarmed," truth, which we must speak until this truth has the "final word": Kreyòl is a full-fledged language which improves learning gains in Haiti – learning gains in reading, writing, math, science, etc. Given the data so far, learning IN Kreyòl should also improve Haitian children's capacity to learn the humanities and second languages like French, English, and Spanish. Fluency in some of these international languages, ALONGSIDE the systematic use of Kreyòl at all levels, can help Haitians benefit from, and also contribute to, the creation and transmission of knowledge, both locally and globally, with self-respect and dignity . . . "Onè . . . Respè . . ."

So, in effect, Haiti is still very far from Martin Luther King Jr.'s dream. But the MIT-Haiti Initiative IS dismantling these age-old barriers that have been implemented through language and education.

There's a lot more to do. But I think we're already showing that language barriers and unequal access to quality education and to other socio-economic opportunities are among these daunting global challenges that we at MIT can help solve (***bitly.com/1oXJqhw***). In effect, we're showing that MIT's expertise, teamwork, and resources, in partnership with Haitian educators and leaders, can transform Martin Luther King's dream into reality, in Haiti as well. And I believe that this can serve as an inspiring example to other communities where language and education are used as barriers to social justice.

Of course, the work is only just starting. We're going to need much more support and a much bigger team to totally dismantle these formidable barriers and to make the dream reality. But this is MIT after all. So I trust we can do it. With the right team, the right level of support and adequate political will, we can have another revolution in Haiti toward equality for all.

Yes . . . "One dream can change the world."

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**The Current East Campus Plan**
Salvucci, from page 1

population caused, in part, by the lack of available and affordable on-campus graduate student housing.

The Institute plan fails to follow through on the recommendations of the review of graduate student housing needs, issued by the commission chaired by Professor Phil Clay, to review the need for increased graduate student housing. The Clay Commission report recommended that MIT build 1000 units of new, "swing," and replacement housing to deal with immediately identified pressing needs for graduate student housing, and further considered the Kendall Square area an ideal location to locate graduate student housing that would be valued by the graduate student community.

Yet the announced plan proposes:

1. To eliminate the 200 units of married graduate student housing and the child care facility at Eastgate, with a commercial laboratory building proposed in its place;

2. Immediate action to build *market-rate* housing on the essentially vacant land controlled by MIT adjacent to One Broadway opposite the new Sloan School expansion;

3. Construction of a commercial office building on the mostly vacant land owned by MIT adjacent to the Kendall MBTA head house, and the building occupied by Cambridge Trust, immediately available for development;

4. Creating a new open space with underground parking below the site in the readily available land at the parking lots adjacent to the MIT Medical Department;

5. An unspecified amount of replacement graduate student housing on a site currently occupied by a potentially historic building (the MIT Press building), which is full of MIT administrative and educational functions, with no physical or financial plan to deal with the relocation of the existing activities, or demolition of the extremely solid existing building.

The net effect of these actions would be to actually *worsen the graduate student housing crisis in the short term by displacing Eastgate housing with a commercial lab*, while there is no relocation plan for the activities currently located at the MIT Press building proposed for replacement housing.

**The proposed actions also ignore the MIT and community feedback to the urban design review launched in response to the recommendation by the Committee on Community Engagement considering how to redevelop MIT-owned property in the Kendall Square area.** The Kochan Committee review was in response to concerns that long-term issues vital to MIT as an educational institution are being ignored by the MIT Investment Management Company (MITIMCo) in the pursuit of short-term real estate profit. The urban design concepts presented to the public by a combination of consultants and MIT faculty identified Kendall as an appropriate location for graduate student housing. It also presented concepts of replacing the parking lots near the Medical building with open space, and redeveloping the housing at 100 Memorial Drive and adjacent buildings, to provide view corridors to the Charles River. But at the public review meetings, the need for this kind of open space proposed at that location was seriously challenged, and concerns were raised about potential loss of housing at 100 Memorial Drive, and the prudence of eliminating still-functional buildings.

The parking and traffic generation associated with commercial buildings was raised by the attendees, but the only response was that City of Cambridge review procedures would be followed. The extremely high cost of underground parking was not discussed. The urban design group stated that there had been no interaction with the Clay Commission, then still considering feedback to its draft report. Substantial comment from the MIT and general community present called for the need for more consideration of these issues, and the integration with the Clay Commission effort, *but the urban design study ended without further interaction with the Clay Commission, the MIT community, or the general public.*

**The announced plan proposes no role for the new Faculty Planning Committee.** After discussion on the campus and adoption of resolutions last spring at the faculty meeting, the Faculty Planning Committee members have been elected. But this Kendall implementation plan preempts any meaningful role for this just-formed committee.

**Finally, the proposed actions to use MIT-owned property near Kendall for non-academic use are in violation of the commitments MIT previously made to the Cambridge Redevelopment Authority and the U.S. Department of Housing and Urban Development as part of the Kendall Square urban renewal plan.** If this commitment were honored, it would protect the long-term interests of MIT as an institution of higher learning from being threatened by rising real estate prices that make academic use seem financially unfeasible. But the Cambridge City Council action secured by MIT to authorize the up zoning of MIT property at Kendall Square threatens to intensify those real estate values, which will make academic uses seem even more unfeasible.

MIT is currently poorly served by a defective administrative structure, which replaced the planning function of the Institute, which ought to be concerned with long-term success of the Institute as an educational and research enterprise over the next 25 to 50 years, and gave the planning responsibility to a real estate development subsidiary of the Institute, MITIMCo, which is dominated by the typical short-term *focus* on profitability in a fluid real estate market over the next five to 10 years.

This structural defect should be dealt with by a further administrative restructuring, but there is no time to defer action

until then. The current deeply flawed plan for the East Campus area should be modified by prioritizing the use of the three easily available sites (at the Cambridge Trust Bank and parking lot, the parking adjacent to the Medical Department, and the MIT-owned site in Kendall Square across Main Street from the Sloan School), to immediately *build replacement married graduate student housing and a daycare center in advance of any demolition of the Eastgate housing*, and to add at least 600 net new graduate student housing units, to reach at least the amount of graduate student housing recommended by the Clay Commission (400 units as replacement and swing housing, and 600 net new housing units). This action would have several beneficial impacts:

**A.** It would show immediate action to build 1000 units of graduate student housing in the Kendall Square area identified by both the Clay Commission and the urban design study as ideal for graduate student housing.

**B.** It could provide an opportunity for a meaningful faculty involvement in campus planning by involving the new committee in the questions of massing and design of the housing reuse of these Kendall parcels of land and the questions raised in the urban design effort about how to redevelop the aging 100 Memorial Drive property by considering interesting new view corridors while increasing the amount of affordable housing at that site.

C. It could also provide an opportunity for the new Faculty Planning Committee to review the Clay Commission report. MIT committed to do a graduate student needs study during the Cambridge City Council deliberations on the MIT proposals to up zone the land owned by MIT near Kendall Square. A study by the Graduate Student Council, presented by then-president of the Council Brian Spatocco, had indicated a shortfall of approximately 6000 graduate student and postdoc beds at MIT, and a severely spiking rental market, reflecting the growing scarcity of housing in both Cambridge and Somerville. Had MIT merely kept pace with the goal articulated in 1962 by the Bush/Brown Committee, there would be approximately 1000 more beds on campus today, built at much less inflated construction costs.

The Clay Commission took an additional year-and-a-half to come up with essentially identical findings of the shortfall on campus and recognized that Cambridge rents have risen by 30 percent in the past three years. It also recognized that the number of graduate students has risen by 800 in the past five years. *In addition, it also noted a likely increase in demand of 3000-8000 housing units in Cambridge will be generated by the expected job growth in Kendall Square.* The Clay Commission did not estimate the amount of affordable housing need generated by the MIT decision to use the former Simplex site for commercial development through Forest City, rather than housing.

But the Commission viewed its mandate very narrowly, and insisted on *not* considering the impact on the affordable housing crisis in Cambridge, Somerville, or Boston; *not* considering the shortfall caused by postdocs; *not* considering the need to renew the aging housing for undergraduate students, *nor* the need for MIT labs, classrooms, libraries, etc.; taking an extremely minimal view of the need for graduate student on-campus housing, based only on last year's waiting list; and *not* considering the recent spiking increases in rental prices in the area. Many observers felt that at least the 2000 graduate students currently in the superheated Cambridge market should be accommodated on campus, at a minimum, while others argued that recognizing the increasing severity of housing prices, it would be more prudent and appropriate for MIT to build over 5000 units of graduate student housing, for both the welfare of the students, and also as a community partner policy to relieve pressure on the superheated Cambridge housing market. To put the shortfall of 5000-6000 beds in the context of affordable housing supply in Cambridge, the entire production and preservation of affordable housing in Cambridge through the City initiatives since the affordable housing program was instituted by the City of Cambridge as part of the Community Preservation Act was approximately 1500 units, roughly half of which are retention and preservation of pre-existing affordable units, for a net addition of fewer than 800 units.

The newly designated Faculty Planning Committee could consider the likely need for approximately 5000 additional on- and near-campus graduate student beds beyond the immediate actions for 1000 units at Kendall in the context of the available MIT-owned sites in the Northwest Campus area. Additionally, the Faculty Planning Committee can begin to grapple with the aging undergraduate student housing supply, as well as MIT's needs for classroom, lab, and library support for the educational mission. *If the commitments to retain MIT-owned property for academic use are respected, the financing of these educational needs can be based on the much lower acquisition cost of this land, not its current inflated market price*, providing a financially stable model for the future viability of MIT as an educational and research center of excellence.

There is now also a unique opportunity for MIT to both secure the long-term viability of the MIT educational mission, by using its campus lands exclusively for education, research, and student housing purposes, *and* capture part of the real estate value it has created. *By selling the added development rights* conferred upon MIT by the Cambridge City Council to private developers of privately held parcels in the Kendall Square area now in the process of framing their development plans, MIT can secure significant financial benefit, while continuing to prioritize the use of MIT-owned land for long-term research, educational, and housing purposes, appropriate for a non-profit university.

continued on next page

**The Current East Campus Plan**
Salvucci, from preceding page

D. It would provide an opportunity for MIT to lead by example. The inflationary impact on the scarce supply of affordable, transit-served housing in the Boston area caused by Boston area university students not housed on campus is increasingly the focus of media attention. But there is no other university in the Boston area that is so reliant on graduate student and postdoc contributions to research as MIT. MIT has readily available land at Kendall. While finance is always a difficult problem, the *Boston Globe* recently reported that the MIT endowment increased by about 19% last year. The sale of development rights in Kendall Square to private developers of non-MIT parcels could further support the financial feasibility of this effort. Graduate student housing built today, at today's construction cost, rather than in the future, at inflated cost, is a prudent investment for the Institute. While it is difficult to get multiple universities to collaborate on a single housing initiative, it remains highly feasible for MIT to deal fully with the housing needs of its own students, and in so doing simultaneously relieve pressure on both the graduate students and the general public. Moreover, MIT can initiate a collaboration with the City of Cambridge to identify locations and financial support to provide affordable housing for the workers attracted by the MIT real estate ventures like Forest City.

In short, MIT could take responsibility for the consequences of its activities, and lead.

**Frederick P. Salvucci** is a Senior Lecturer in the Department of Civil and Environmental Engineering *(salvucci@mit.edu)*.

## Teaching this spring? You should know . . .

the faculty regulates examinations and assignments for all subjects.

View the complete regulations at: ***web.mit.edu/faculty/teaching/termregs.html***.
Select requirements are provided below for reference.

Contact Faculty Chair Steven Hall at x3-0869 or *srhall@mit.edu* for questions or exceptions.

No required classes, examinations, oral presentations, exercises, or assignments of any kind may be scheduled after the last regularly scheduled class in a subject, except for final examinations scheduled through the Schedules Office.

**Undergraduate Subjects**
By the end of the **first week** of classes, you must provide:

- a clear and complete description of the required work, including the number and kinds of assignments
- the approximate schedule of tests and due dates for major projects
- an indication of whether or not there will be a final examination, and
- the grading criteria and procedures to be used

By the end of the **third week**, you must provide a precise schedule of tests and major assignments.

Tests, required reviews, and other academic exercises outside scheduled class times shall not be held on Monday evenings. In addition, when held outside scheduled class times, tests must:

- not exceed two hours in length
- begin no earlier than 7:30 PM when held in the evening, and
- be scheduled through the Schedules Office

In all undergraduate subjects, there shall be no tests after Friday, May 8, 2015. Unit tests may be scheduled during the final examination period.

**Graduate Subjects**
By the end of the **third week**, you must provide:

- a clear and complete description of the required work, including the number and kinds of assignments
- the schedule of tests and due dates for major projects
- an indication of whether or not there will be a final examination, and
- the grading criteria and procedures to be used

For each graduate subject with a final examination, no other test may be given and no assignment may fall due after Friday, May 8, 2015. For each subject without a final examination, at most, either one in-class test may be given, or one assignment, term paper, or oral presentation may fall due between December 5 and the end of the last regularly scheduled class in the subject.

**Collaboration Policy and Expectations for Academic Conduct**
Due to varying faculty attitudes towards collaboration and diverse cultural values and priorities regarding academic honesty, students are often confused about expectations regarding permissible academic conduct. It is important to clarify, in writing, expectations regarding collaboration and academic conduct at the beginning of each semester. This could include a reference to the MIT Academic Integrity Handbook at: ***integrity.mit.edu***.

# Helping Freshmen Prepare for Their First Summer Internship or Research Experience

**Meredith Pepin**
**Christopher Capozzola**

**THE FRESHMEN/ALUMNI SUMMER** Internship Program (F/ASIP) provides MIT freshmen the opportunity to develop competencies in career exploration, communication, professional etiquette, and internship search skills through a graded, seminar-style course. F/ASIP has grown in leaps and bounds since its inception in 1997 and now boasts over 1,000 program alums who have taken advantage of summer opportunities around the globe to complement their academic studies. It helps first-year students articulate their career interests and strengths, master the summer internship process, and apply for (and get!) internships for the summer after their first year.

Global Education & Career Development (GECD) staff work collaboratively with student leaders to teach first-year students how to acquire internships or research experiences for the summer and to complete them successfully. F/ASIP begins with a full-day symposium during IAP of the freshman year and continues throughout the spring semester. Internships or research experiences occur the summer between freshman and sophomore year, during which time students are also paired with an alumni mentor in an industry of interest to them.

As early as September, freshmen receive formal and informal messages suggesting that opportunities do not exist for them during their first summer after MIT. At the Fall Career Fair, recruiters frequently tell first-year students to apply for their internships when they are sophomores or juniors. Upperclassmen who may have started their internship search too late, or did not have a successful outcome, share their experiences with new students, compounding a false sense of opportunity deficiency. F/ASIP demystifies the competitive internship search process, helps students develop an individual sense of direction, and gives freshmen a professional advantage in obtaining a summer experience. They can see the immediate value of MIT's education in the real world and get a head start on their career paths. Following a 2014 course survey, all students agreed that F/ASIP SP.800 helped them to identify potential occupations of interest and write an effective resume; over 90% reported that they could develop a career plan and that they would recommend the course to incoming freshmen.

Global Education & Career Development (GECD) staff work collaboratively with student leaders to teach first-year students how to acquire internships or research experiences for the summer and to complete them successfully.

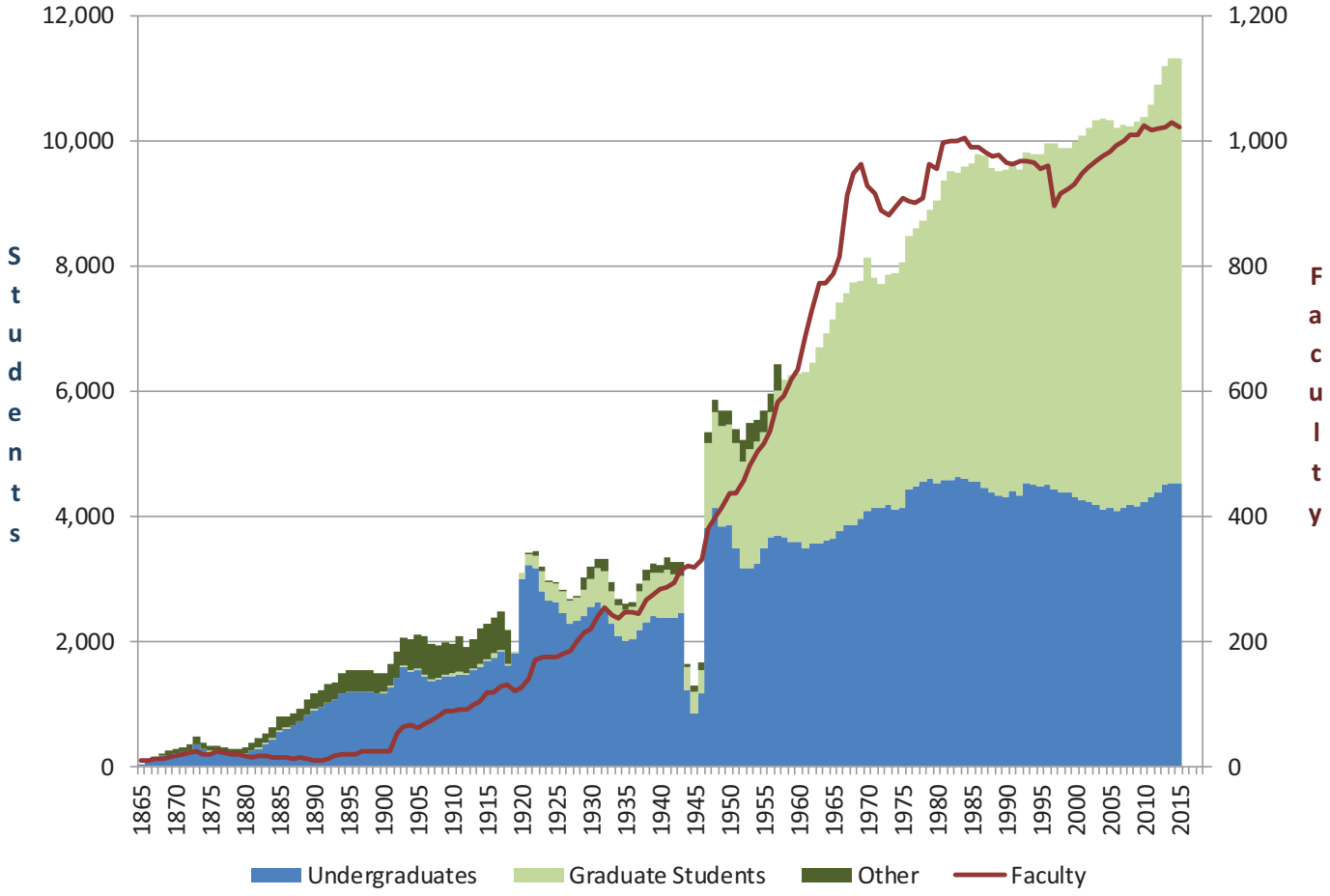
Faculty, principal investigators, and employers all emphasize MIT students gaining professional and communication skills in addition to technical expertise. F/ASIP also supports "soft skill" acquisition. The course incorporates oral, written, and communication skills, and navigating difficult workplace situations into its curriculum. Students draft resume and cover-letter documents, compose reflective and career goal-setting essays, conduct mock interviews with employers, collaborate on team projects, deliver oral presentations, and strategically think through real-world case scenarios. Developing these skills – highly sought after by employers – can be immediately utilized in future academic settings, group projects, research labs, as well as industry.

F/ASIP students carry these polished professional qualities, along with enthusiasm, into a lab or industry work setting and the positive feedback from supervisors has been impressive. Through the years, F/ASIP students have worked in a variety of settings in the summer before their sophomore year. Many first-year students excel in summer research opportunities here at MIT, and others have achieved success at locations such as NASA JPL, Facebook, Johnson & Johnson, TripAdvisor, P&G, the U.S. Department of Energy, Morgan Stanley, Air Liquid, and Argonne National Laboratory, to name a few.

Want to hire a F/ASIP student for your lab? E-mail *fasip@mit.edu* with information about opportunities in your lab for summer 2015 so that we can promote your lab to F/ASIP students.

**Meredith Pepin** is a Career Development Specialist in the Global Education & Career Development Center *(mapepin@mit.edu);* **Christopher Capozzola** is an Associate Professor of History and the Faculty Advisor for F/ASIP *(capozzol@mit.edu).*

## M.I.T. Numbers
# MIT Faculty and Students 1865 – 2015




**Source:** Office of the Provost/Institutional Research