**ORIE Graduates Choose to Teach...for America**

While next fall many of their classmates will be working in manufacturing, consulting or finance, two recent ORIE graduates will be teaching in high schools. Both attended the same high school in Hawaii’s before coming to Cornell.

**Megan Akamine**
Megan Akamine ’10 has been selected for the Teach for America Corps. After training at a Teach for America summer institute in Georgia, she will teach math at a school in her home state of Hawaii’s. Megan’s mother is a public school teacher on Oahu, where Megan attended Punahou, the elite alma mater of President Barack Obama.

At Cornell, Megan plays club basketball, is active in the philanthropic activities of her sorority, and works as a teaching assistant and statistics tutor. She has interned with Hawaiian Airlines and Blackrock. Teach for America entails a two-year commitment.

“I am very excited to be a part of Teach for America,” Megan says. “I hope to somehow utilize all that I’ve learned through Operations Research in the near future, since I’ve really enjoyed the past four years.”

**Vivi Nguyen**
Vivi Nguyen ’04 M.Eng. ’05 is a Math for America Fellow, one of about 40 individuals selected for the five year program for ‘talented individuals who are new to teaching.’ Through Math for America, Vivi has a full tuition scholarship and stipend to obtain a master’s degree at NYU’s Steinhardt School of Culture, Education and Human Development. With the fellowship, she made a five year commitment under which she will teach for four years at a New York City public secondary school math teacher and receive supplement to her New York City teacher’s salary.

Like Megan, Vivi is a graduate of Punahou on Oahu. Since her M.Eng. graduation Vivi has been working for a large engineering consultancy, AECOM, on transit and utilities projects. Her role is risk management. “I’ve been making good use of my statistics and simulation education,” she says, working on high level projects like the World Trade Center and the Second Avenue Subway in New York.

Vivi notes that her time at both Punahou and Cornell provided opportunities beyond classroom work. “While completing my M.Eng. in ORIE, I worked extensively with a small group on a real-life telecommunications sales project for a consulting firm and gained leadership experience via my role as class co-president. I am excited to be part of the 2010 Math for America fellowship group and look forward to providing a similar range of opportunities to my students.”

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[http://www.orie.cornell.edu/orie/alumni/](http://www.orie.cornell.edu/orie/alumni/)
Professor Mark Lewis works with equal facility on both theory and applications. For example, he studies and teaches about the design and behavior of queues, or waiting lines, and also develops theory for this and other problems that are applicable well beyond bank lines.

One particular area of application of queueing theory has been experienced by anyone who calls in to a customer service center and is told that “all our agents are busy serving other customers.” Most customer service organizations, including those that outpatient their phone banks to call center companies, prefer not to have callers wait very long for service. Assuring that long waits will not be a problem requires careful analysis of the system, typically using software that predicts necessary staffing or other resource allocation to improve responsiveness.

Call Center Grant

In 2008 the National Science Foundation awarded a grant to Mark Lewis to study the impact of events in three possible alterations in the routing of calls. One would upgrade lower priority customers (in a system that divides customers into priority classes) if they have already spent too much time in the system. Another would improve the treatment of the “largely ignored phenomenon of customer reneging (also called abandonment).” And a third would encourage some customers to try again later rather than wait, in order to temporarily reduce demand. These variations challenge the scope of existing theory, so Lewis expects the research to break new ground.

Markov Decision Processes Grant

In a second grant awarded by the National Science Foundation in 2009, Lewis and E.A. Feiberg of Stony Brook University propose to expand theoretical results about a broad class of problems that encompass call center control, inventory management, and revenue management. They point out that “the methods to be developed in this project stand to fill important gaps left in the literature,” gaps “that are becoming increasingly more crucial to applications.”

Mitre Award

“I like to work on a mix of theoretical and applied problems,” Lewis says. “One challenges me technically, while the other keeps me grounded.”

With respect to the latter category, he recently was awarded funding by the Mitre Corporation to study a problem that would arise in the event of a large scale catastrophic event. In the case of an event that impacts multiple municipalities, each controlling an emergency response resource, Mitre has asked how the resources should be reallocated under a central control over time.

“From a modeling perspective this is interesting since one has to analyze how many resources are available for reallocation, where they should be allocated and what they will achieve,” Lewis says. “Moreover, this has to be done several times over the planning horizon, and with regard to both previous and future decisions.” Lewis first came into contact with Mitre as an advisor to a series of Master of Engineering projects for the not-for-profit organization chartered to work in the public interest.

This award and the grants are being used to support Ph.D. students, summer research, travel, and dissemination of research results.

National Science Foundation Awards Grants to Professor Mark E. Lewis

For the past 13 years, an annual “Bits On Our Minds” exhibition has showcased student digital technology research projects. On March 3, 2010, students from a variety of disciplines displayed 40 projects on a wide range of topics, ranging from “Emotion Classification and Decision Making on Networking Sites” to “Spinal Compression Fracture Detection” to “Spoken Language Detection.” ORIE senior Thomas Byuen and M. Eng. student Germán Gutiérrez Gallardo presented a poster describing the work of the “Monopoly Strategy Research Group (MonStR).”

Faculty from the Computer Science Department awarded one of the top prizes in the exhibition, “Where’s the BOOM (Brains On Our Machines),” to the work of Gutiérrez and Byuen, which included contributions from other students who have graduated and was advised by Professors Eric Friedman and Shane Henderson. Criteria for the award include “novelty, elegance, simplicity, and appropriateness of algorithms, and overall software engineering.” Byuen said “we were pleasantly surprised when we heard that we had won the award.”

MonStR’s poster presentation dealt with estimating the probability that a game of Monopoly never ends. Earlier work by the group estimated that the probability of this happening is 12 percent, assuming there are two players, each using a particular simple strategy. Since then, Byuen and Gutiérrez have explored other strategies, including ones that replace the probability of the game going on forever to 2 percent.

This current best strategy, called “SureFire,” entails maintaining and updating a subjective value for each property on the board. Now the team is working on improving this strategy by tinkering with parameters that dictate how players value properties, when they buy, sell or mortgage, etc., optimizing them to increase and eventually maximize the probability of winning with strong confidence.

As a related project, the group is exploring whether the game of Monopoly can be “tweaked” to illustrate how financial crises might arise, under some simple and transparent mechanisms. “From an economic situation that has changed since the game was invented. The revised game assigns some of the players the role of bank- ers, with the ability to make loans to other players and introduces some financial measures for these players, such as the ‘leverage ratio’ (equity divided by average total consolidated assets). The group will study the impact of the leverage ratio on banks, the likelihood of them going broke and, lastly, the benefit to players in bailing out the banks.”

As Byuen and Gutiérrez observed in a published paper about their work in general, “the reason this is important is not just that we are enthusiasts and see it that way, but also because Monopoly is a microcosm of many important systems in real life, where sequential decisions under uncertainty are made in the face of competition from other entities.”

Gutiérrez, who is from Guadalajara, Mexico, will graduate with a Master of Engineering degree from ORIE in May 2010 and join Oliver Wyman, the management consulting firm in September. Byuen, from Woodside NY, will intern at Ernst and Young in the summer of 2010 after which he will undertake a Master of Engineer- ing program in ORIE, concentrating in Financial Engineering.

ORIE’s Monopoly Team Takes the “Where’s the BOOM” Award

ORIE’s Amy Chen ‘10 Is a Young Inaugural Year Kessler Fellow

he Kessler Fellows program was established in Cornell Engineering in 2008 to give a select group of students the chance to learn how to make their technologi- cal innovations into working businesses. Amy Chen ’10 was one of 10 students selected to participate in 2009, the first full year of the program. She and 9 other Kessler Fellows held a symposium in April at Entrepreneurship@Cornell’s Celebration 2010, an annual event that brought together more than 700 students, alumni, faculty and staff involved with entrepreneurship.

Students in the program, established by Andy Kessler EE ’80, get an opportunity to learn the business side of entrepreneurship as undergraduates. In their junior year they take a course, featuring alumni entrepreneurs, in the essentials of entrepreneurship. They then spend the sum- mer interning with a start-up, and in the fall they present a summary of their experience to the Kessler Fellows. They are selected from the engineering community. Students seek out companies for their internship, which Cornell helps arrange, and facilitate the salary of the students. Kessler Fellows pay the salary of students, thanks to Kessler’s generosity.

Chen’s Internship

Through a Cornell website, Chen located a company, Thevi Cosmetics, owned by her UCLA Thambirajah AMD ‘97, and spent her internship with the company. She did market research and planned and executed a social media marketing plan. In fact she helped change the direction of the company from being a brand targeted to Indian women to an “Indian lifestyle-inspired” brand that “had a wider appeal”, according to Thambirajah.

“I love Kessler,” Chen told the symposium audience. “A huge part of the value [of the program] is the mentorship - personal and professional advice - it provid- ed.” She was advised to “follow my dreams, despite what others say,” she said.

Chen, who in a previous internship at Kodak had done work with social media, found the culture of her start-up employer quite different. “I worked out of the CEO’s apartment”, she said, noting that it “got hectic” at times when she shared her work space with Thambirajah’s “adorable twins.”

“Amy has a strong drive toward tackling tasks which have uncertainty in intang- ible outcome, and she has the flexibility to adapt a project to meet our end objec- tives,” said Thambirajah. “These two qualities are essential for a startup com- pany.” Following graduation at the end of May, Chen will go to work for another startup company, one that is based on the idea of the semantic web.

The list of Kessler Fellows for 2010 includes two ORIE juniors, Joshua Moskovitz and Jonathan Liu. Working with Cornell alumni Hill Trenchard, Joshua created an open source website for a startup founded by Trenchard. According to Tech Crunch.com, Readyforay is developing “applications that will create a virtual marketplace for on-demand labor.” Jonathan “wanted to pursue a summer experience within finance and I originally thought that finding such an opportunity within a startup environment” would be possible, he said. However “such a combination in the industry was extremely difficult to find” so he opted to accept an offer from Citigroup.

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