In support of this improved program, we have streamlined and consolidated many of our operations and procedures and updated our system of tools to allow us to deliver a higher quality program to more students while containing costs.

Our interactive website—still in development—is a key example. Developed with help from several MIT computer science majors, the student pages of the site already feature innovative functions such as online event registration, electronic journaling, and assessment mechanisms. Soon, the rest of the website will include dedicated portals with resources tailored for students, employers, volunteers, and partner organizations across the Institute. We expect exciting new developments over the next six months, and you’ll be the first to know when we launch!

Sincerely,

Susann Luperfoy

---

From the Executive Director 1
Internships by the numbers 1
UPOP covers the world 2
Advanced Electron Beams 2
Angie Kelic, mentor 3
UPOP at work 4

INTERNSHIPS BY THE NUMBERS

- More than 80 percent of students pursued internships in industry
- 12 percent engaged in research
- The remainder took summer courses or conducted other projects
- To ensure that internships were progressing well, UPOP staff visited 97 students in 51 cities
- 32 students worked in 15 foreign countries including Germany, Vietnam, and Romania

---

At home and abroad
Summer 2008: UPOP students interned in 15 foreign countries in addition to the United States
UPOP covers the world
The summer of 2008 was a banner time for UPOP internships. Students were engaged in ground-breaking research, humanitarian projects, and industry-related challenges in the USA and 16 countries.

Sunny with 100% chance of learning
Thanks to the work of NASA’s Goddard Space Flight Center and its Geostationary Operational Environmental Satellites (GOES), you can rest assured that your daily weather forecast is in safe hands.

These meteorological satellites provide a continuous data stream for the national weather service, enabling real-time monitoring of the atmosphere.

Jennifer Allen, an Aeronautics and Astronautics major, spent the summer “developing a better algorithm for correcting for co-registration error from the imager. In layman’s terms: working to help the satellite take more accurate series of pictures of the earth.”

Pumping up the volume
Electrical Engineering and Computer Science major Harley Zhang pumped up the volume at Maxim Integrated Products, Inc.

Maxim manufactures analog and mixed-signal semiconductors, which are used in a variety of industries. Harley worked with the audio applications group in the multimedia division, where he worked on increasing the efficiency of a headphone amplifier circuit.

It’s not a flying car, it’s a roadable aircraft
The MIT graduates behind Terrafugia, Inc.’s Transition® aim to bridge the divide between car and plane. Their prototype has folding wings, and is designed to be stored in a garage, driven in traffic, and will fly up to 400 nautical miles.

Mechanical Engineering major Rastislav Racz participated in the physical production of the prototype: sanding, bonding, and sawing components. He was hugely impressed with his tight-knit group of co-workers, all dedicated to the effort of literally getting the project off the ground.

“I had a unique ‘hands-on’ internship which many people only dream about,” says Racz.

Putting some backbone into your work
Ariadne Smith, a Mechanical Engineering major, spent the summer at Boston Scientific, developing tests for the company’s Precision Plus™ Spinal Cord Stimulator System. The system incorporates an implantable neuro-stimulator device that delivers electrical signals to the spinal cord, masking pain signals as they travel to the brain, and helping survivors of spinal cord injuries manage pain that hasn’t been alleviated by physical therapy, pain medications or other methods.

Smith designed tests that entailed bending, twisting, and stretching the end of the leads to ensure that the electrodes emitting the signal remain functional and intact. She also used feedback from anesthesiologists and surgeons as the basis for four invention disclosures.

We’ve worked with UPOP for three years. I love it! The interns have made real, concrete contributions. They are a great addition to the company.

Anne Testoni
Director of Marketing and Applications Development
[Advanced Electron Beams]
Katie Rowe, interning at Advanced Electron Beams: “They are convinced that electron beams are the future and their technology will change the way the world works.”

AEB says it delivers electron beams in a form factor that is “up to 10 times less expensive and 100 times more compact in size.” Testoni likens the value of the new technology to that of being able to wash a car yourself, rather than having to haul it to a car wash facility into which your car may or may not fit.

Increasing environmental concerns have expanded the market for the AEB Emitter.

“Pursuing our type of technology makes sense economically and ecologically,” says Testoni. “We enable companies to go green by producing highly efficient, modular electron beam technology. We have a passion to bring this to industry.”

This passion stood out to chemical engineering major Katie Rowe, who interned with AEB this summer.

“The leaders in AEB are all convinced that electron beams are the future and their technology will change the way the world works,” Rowe wrote in her summer journal.

Founded in 1999 by Avnery and now venture-capital funded, AEB retains a “tech-y, start-uppy” feel, says Testoni, with the corresponding spirit of innovation, creativity, and free communication.

The philosophy is simple, says Testoni. “We bring them in and assume they can be treated like a regular employee. We give them real projects, under the mentorship of at least one experienced engineer. We say: here’s your project. We let them think about how to approach it, and encourage them to talk about the project, be part of the work team, to present their work, to write reports.”

Mechanical Engineering major Zihao Zhang, who conducted a product development internship this summer, found that his AEB experience was both a challenge and a boost to his interpersonal skills: “I handled projects independently and in that effect, I developed more confidence. I required less help from my superiors over time.”

Katie Rowe had the opportunity to work on-site with one of AEB’s Fortune 500 clients: “I spent a week in Oklahoma working on-site in a factory with my supervisors. I was very impressed with the way they got right into the dirty work alongside me as an intern. It was also nice the way they trusted me with many projects beyond what interns are entrusted with at many other companies. This made my summer a much more valuable experience.”

AEB’s experience was equally positive. “We’ve worked with UPOP for three years,” says Testoni. “I love it! The interns have made real, concrete contributions to [the] client companies. They have invigorating perspectives, are a great addition to the company, and we enjoy having them. Each summer, our average age drops a few years and that keeps us energized!”

UPOP MENTOR

Angie Kelic, PhD ’05

Averting the worst-case scenario at the Department of Homeland Security

For as long as she can remember, UPOP mentor Angie Kelic, PhD ’05, has been interested in how things work.

“I was one of those kids who took their toys apart and couldn’t always put them back together,” she remembers. “My parents had to keep me away from the toolbox.”

They did not keep her far from the sandbox, however. Kelic’s father was active in city politics, and she helped out with campaigns from a very young age.

As it turned out, her exploration of moving parts—of both her toys and the democratic process—laid important groundwork for her current career with the Department of Homeland Security.

Kelic pursued advanced math, science, and computer coursework throughout high school, and developed an interest in airplanes and satellites. At the University of Michigan, she earned bachelor’s degrees in both in aerospace engineering and political science.

“The combination gave me a unique perspective. You can make technology do whatever you want,” she says, “but without an understanding of policy and regulatory issues, you can’t accomplish much.”

“Policy affects so much in the realm of technology, and I’ve always wanted to be a part of that,” says Kelic, whose continued interest in both topics brought her to pursue graduate
Security, charged with evaluating national preparedness and security issues.

Kelic explains: “We work for the Department of Homeland Security and look at infrastructure, like water and telecommunications, and what would happen in case of a natural or man-made disaster.

“For example, in the case of a hurricane, we start analyzing the situation 96 hours before landfall and producing daily reports and updates. We have the day to look at weather information, and figure out which parts of infrastructure are likely to be affected. People can use our data to decide where to send supplies, whether to evacuate an area, and how whatever is happening is going to affect infrastructure like the electrical grid, telecommunications, natural gas, or petroleum.”

The analyses of Kelic and her team are shared with decision-makers at FEMA and the Department of Homeland Security. Recent projects have included both real and potential disasters: impact analyses of hurricanes Dean and Flossie and the California wildfires, attack scenarios in major cities, analysis and policy recommendations for pandemic influenza, and post-event evaluations of hurricanes Rita and Katrina.

“I enjoy making a difference,” Kelic says. She takes enormous satisfaction in translating technical data into a language that policy-makers, many of whom lack scientific training, can understand.

“I present the most important information in a way that will help them make good decisions.” These decisions can often ameliorate a disaster’s impact, save lives, and prevent a problem from recurring.

UPOP’s mission resonates with Kelic’s goals. “The program gives students the perspective that problems are not always just technical, which is something you don’t always get in school. UPOP shows them that issues can be about communication, and that knowing technical lingo is not always enough to make a case. Students need to understand that and be exposed to it.” By teaching about different communication styles, “UPOP is playing a very useful role,” she says.

Kelic advises aspiring engineers, “If you’re at MIT, you’re getting a solid technical background. Just be sure to learn how different people view the world and seek out that diversity. Get as many perspectives as you can. Based on what I’ve seen, UPOP students have the potential to go pretty far, if they just chase it.”

UPOP AT WORK

From fashion crises to career concerns, UPOP to the rescue!

“NOT THE BOOTS!” types Sharona Jacobs, UPOP’s program manager for student and alumni relations, looking over a series of photographs emailed mere hours before a student’s job interview.

“FASHION EMERGENCY,” said the email, with photos of many, many shoes.

“Boots—too casual; try the pumps,” advises Jacobs. When the fall recruiting season is in full swing, the UPOP office is crowded with students. UPOP’s open door/phone/email policy, and its commitment to serving students with challenges big and small, entails continuous coaching. Wondering about what to wear, how to choose between multiple job offers, networking strategies? UPOP to the rescue!

Of course, UPOP’s coaches cover larger questions about career planning, and help students connect their academic and professional interests.

“We work with students one-on-one in order to find each student’s best vocational fit,” says Jacobs. “This program is unique in that we provide a warm, encouraging environment, and develop long-term relationships with our students.

“Many of them stay in touch for months and years after their UPOP time. It is such a joy to watch the students change with each new employment experience, and to watch them develop into polished professionals.”

The UPOP team:
Dori Devine, program manager—employer relations; Sharona Jacobs, program manager—student and alumni relations; Dori Peleg, program manager—faculty and mentor relations; Susan Luperfoy, executive director; Jessica Jones, administrative assistant.