Student Profile: Salma Habib, COM

by Julie Kent

Gun-control, global warming, and the war in Iraq all have one thing in common: they are all hot-topics around the nation, especially in politics. Another controversial issue revolves around the health care industry and how the United State's policies differ from those of other countries, notably the United Kingdom. One Georgia Tech student, Salma Habib, spent her time studying abroad in Oxford researching this topic, specifically focusing on emergency healthcare and policy.

Currently attending medical school, Salma always had an interest in both business and medicine. While an undergraduate Management major at Georgia Tech, Salma worked with Dr. Matt Higgins to develop a research project she could complete while studying abroad. Dr. Higgins and Salma also submitted an application for the President's Undergraduate Research Award. “Before I knew it, I had received the PURA award, and I was studying data of local hospital's emergency rooms before I left in mid-May,” Salma recalls.

Completing her research abroad, Salma did not have the typical classroom experience: “It was up to me to seek out journal articles that related, to find people to interview, and to just figure out the UK's health system that I didn't know anything about. The project taught me how to take initiative and go after information that wasn't readily available. In class, students can just e-mail the professor or look something up in a textbook, but this experience taught me to figure out everything for myself. I could take the project in any direction I wanted.”

Salma’s final paper included information from financial counselors, doctors, and staff regarding the quality and costs of a typical emergency room visit in the United States. She also consulted with national journals to come up with general cost data. During her time in the United Kingdom, Salma was able to interview medical students and other direct sources to compare their National Healthcare System to the private/federal insurance system in the United States.

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Student Interview: Eva Petrova, ISYE

U/G Research: How did you become involved in research as an undergraduate student at Georgia Tech?
EP: I first learned about undergraduate research opportunities through a good friend of mine who was an undergraduate student in Electrical Engineering and was working on a research project for a professor in his department. My friend’s research experience was very rewarding and he had a chance to present his research findings at several professional conferences; his research background helped him a lot when he decided to apply to graduate school. At that point I also decided that I have an interest in doing research. I emailed several professors at the School of Industrial Engineering and asked them if they needed a research assistant; unfortunately none of them had a research opportunity for an undergraduate student at that time. The following semester, I came across an email sent by an ISYE professor who was looking for a research assistant. I read the description of the research project and was immediately interested by the topic – “Preventing Hepatitis C by finding its predictors”. I hurried up and scheduled a personal interview with the professor to discuss my interest and the project details. Later, I was also awarded a PURA scholarship to fund my research work.

U/G Research: Briefly describe your research experience.
EP: I worked with Dr. Julie Swann and Dr. Paul Griffin on a research project which aimed to evaluate different predictors for Hepatitis C. Specifically, the project focused on evaluating one predictor - bad oral health, and aimed to show that people with bad oral health are more likely to carry the virus of Hepatitis C. The first stage of the project was to gather substantial statistical evidence to support the hypothesis that there is a high correlation between Hepatitis C and bad oral health. The next phase of the project was to conduct a cost-benefit analysis to test which areas and healthcare facilities in the country should be targeted in order to discover the largest number of Hepatitis C cases. This research project’s findings had a significant importance for the Center for Disease Control which seeks to identify part of the population that is most likely to carry the Hepatitis C virus. The CDC has a mission to carry out prevention efforts for detecting Hepatitis C at its early stages before it has gone untreated for longer periods of time.
I received a PURA award which helped me fund my research work and spent around 15 hours each week working on the project. I had regular meetings with my advisors, at least 2 times a week to discuss my findings and my progress. I also communicated with them through email on a regular basis.
I was interested in this research project because I believe that engineers and scientists should not stop trying to find new and innovative ways to control diseases, decrease their outbreaks and save people’s lives.

U/G Research: What have you learned during your experience that goes beyond the classroom?
EP: I learned how to apply the knowledge I acquired at school to solving real world problems.

U/G Research: What’s the number one piece of advice you would give to fellow undergraduates who might be interested in research?
EP: Be really passionate about the research proj-
Grad Student Zen Mehra talks about Undergrad Research at GT

As an undergraduate, I worked under the mentorship of Dr. Shyh-Chiang Shen in the school of Electrical and Computer Engineering (ECE). While his research focused on the development of wide bandgap devices for optoelectronic applications, my project was narrowed down to the fabrication of optimum ohmic contacts for these devices. Optoelectronic devices are the whole gamut of structures like lasers, Light Emitting Diodes (LED), photodiodes, and solar cells that deal with the interaction of light with particles inside a semiconductor. The interaction of photons (packets of energy that enable light transmission) and the fundamental carriers (electrons/holes) in a semiconductor provides for immensely challenging and interesting physical phenomena. Optoelectronic devices also form the bedrock of the lighting industry, and have tremendous commercial importance. The market demand for LED’s is slated to reach $10.6 billion by 2011, and they have dominated the automotive and commercial lighting sectors.

Ohmic contacts help different optoelectronic devices connect to each other, or to other components in a circuit. Since the average integrated circuit has millions of transistors hooked up, the contact has a vital impact on power dissipation and switching speed (on-off or off-on). Experimentally, they are often very sensitive to changes in humidity or cleanliness of the cleanroom environment. In simple terms, I was looking for an ideal time-temperature combination to treat a metal-semiconductor contact such that it gave us low resistance and optimum linearity. This was a very interesting and important area of work, and is often treated more as an art than a science.

In order to conduct this study, I was required to follow a systematic research procedure outlined in the lab. Fortunately, I had a senior PhD student in addition to my advisor mentoring me through the process, who was an invaluable treasure trove of information. A background survey of important journal publications gives one an idea of what work has been done in a particular field, and the results obtained. A detailed experiment plan has to be outlined after this, with specific targets and expected results in mind. Advisors and PhD students, who have years of experience, often help making these schedules more ‘realistic’, and accounting for real world considerations. Finally, experiments are run and results carefully recorded. The schedule may at times change, as a spectacular or poor result often alters the future course of action. The most important

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Mentoring Undergraduate Researchers: Roundtable Discussion

Join us for a roundtable discussion on how to develop appropriate yet challenging & meaningful projects for undergraduate researchers. Several seasoned veteran mentors of in research will be in attendance to join in the informal discussion. This workshop is geared toward faculty, graduate students, post-docs, research scientists, and others who mentor undergraduates in research. Drinks will be provided, but feel free to bring your lunch.

November 28, 2007
12noon-1pm
Library - Wilby Room

Questions? Contact UROP at urop@gatech.edu.

Sponsored by the Undergraduate Research Opportunities Program (UROP) and the Center for the Enhancement of Teaching and Learning (CETL).
GT Approves “The Tower”  
*by Mark Youngblood*

The Board of Student Publications and Student Activities Committee recently voted to approve a charter for a new undergraduate research journal on campus. The purpose of ‘The Tower’ will be to distribute a publication comprised of undergraduate student submissions. Submissions would include articles on individual and team research projects, reviews of recent research literature, and possibly opinion pieces related to research, among others. Specific content solicited would be at the discretion of the journal’s editorial board and its faculty advisory board. The journal would provide opportunities for Georgia Tech undergraduate students to publish articles emphasizing research on campus.

Organizers of the journal believe it will benefit campus in several ways:

- To showcase the variety of interesting and significant research that is completed by undergraduates each year.
- To provide an opportunity for undergraduates to publish their original work and gain interdisciplinary visibility.
- To increase publicity for the Undergraduate Research program at Georgia Tech - will benefit students, faculty, and the Institute as a whole.
- To experience what it takes to review research and publish a journal will help students to build skills that will impress employers and graduate schools after graduation and
- To join and compete with some of the most prestigious schools in the nation who publish undergraduate journals.

All editorial board positions have been filled and applications will soon be available for assistant positions and manuscript reviewers. The journal will begin accepting submissions November 8th, and expects to publish by the end of the spring semester.

“The Tower” Editorial Board  
http://www.gttower.org

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Salma Habib ...cont’d from page 1

Americans spend about twice as much on health-care (~16% Gross Domestic Product while British are closer to 8%), and there are still about 1 in 6 Americans without health insurance (receiving little to no treatment). The British, however, don’t have the same quality of healthcare as Americans, due to waiting lists for procedures and later critical care attention. It’s a cost for quality balancing act, and this is one reason why the United States is in its current healthcare crisis.

During her time at Georgia Tech, Salma was also President of Georgia Tech’s American Student Association and the Society of Women in Business. She is now attending medical school and working towards her dream of becoming a doctor.
Mentor Profile: Marlit Hayslett, OPAR

It was the fall of 2006 when Marlit Hayslett began actively working with undergraduate students. Now she says she can’t operate without them. Hayslett is the Program Manager for the Office of Policy Analysis and Research (OPAR) within the Georgia Tech Research Institute. OPAR complements GTRI’s technical research with public policy analysis. In addition, OPAR serves as a resource to the Georgia General Assembly on science and technology (S&T) issues.

Currently, OPAR interns serve for one semester. They have two primary activities, both of which are intensively research-oriented. The first is to participate in OPAR’s research project, Technology to Policy, affectionately known as T2P. This work is developing a methodology for forecasting the public policy implications of emerging technologies. This is a challenging project because the team is embarking on uncharted territory. The team has energetic and provocative brainstorming sessions that push T2P to the next level. This important research would not be happening without undergraduate students.

The interns’ second responsibility is to author two or three policy bulletins over the course of the semester. These are brief documents of two to four pages in length. They address S&T topics such as quantum computing, health information technology and alternative energy. The bulletins succinctly describe the policy landscape of the area. Bulletins provide rigorous training in effective, clear writing.

Hayslett believes that undergraduate research is critical to students’ academic experience and should be a required part of completing their degree. It offers an opportunity to apply and test the theories they are studying in class. So often students take what the professors say as the final answer. Undergraduate research empowers them to question those assumptions and discover for themselves.

If students are interested in serving as an OPAR intern, please contact Marlit Hayslett at marlit.hayslett@gtri.gatech.edu.

Mark Your Calendars!

Undergraduate Research Presentation Series.
Topic: Robotics
November 26, 6:00 PM
GT Library, East Commons
Speakers: Lionel London (Phys), Andy Bardagjy (EE), and David Friedman (EE)
Students from all disciplines are welcome to attend. Pizza will be provided.

If you’re interested in giving a presentation in later events, please contact Jiuguang Wang at j.w@gatech.edu or Julie Kent at jkent2910@gmail.com.

Sponsored by the Student Advisory Board for Undergraduate Research (SABUR).

“The Tower” Undergraduate Research Journal Info Session for Submitters and Reviewers
Thursday Nov 29th
11am - 12:30pm
Student Center Ballroom

For more information contact Mark Youngblood, Editor in Chief, at mark.youngblood@gatech.edu.

2008 Spring Symposium
April 3, 2008
Student Center Ballroom
Atlantic Coast Conference (ACC) Undergraduate Research Conference
April 18 & 19, 2008
Florida State University
Tallahassee, Florida
aspect of research is interpreting these final results, and drawing conclusions for future work. This can be a grueling but immensely rewarding process.

**Looking at Graduate School**

I was only looking at Georgia-Tech as a graduate school option, so I do not know about the application process at other universities. However, alumni and peers have often told me that having research experience often makes it easier to get an application noticed, not just at graduate school but even in industry. Within a graduate program, faculty often appreciate the value of undergraduate research and know that a student is well equipped to add value to their team. This makes finding an M.S. or even a PhD advisor much easier. The opportunities to present your research at poster competitions and symposiums, part of the research option, are a great way to network with other students and showcase your work.

**To Students Pursuing the Research Option**

Having to write your thesis helps a student crystallize research objectives, and organize results better. The research option provides one with a great framework to write a thesis, and the course is a step-by-step approach to complete the writing on time. Not only do you learn to organize your work in a proper format, the mechanics of technical research writing are often very different, and rarely taught as well.

The most rewarding experience, however, is the opportunity to learn about research being conducted in various schools across the university, in areas as varied as statistical debugging to reproductive patterns in tropical fish.

As a research option student, I would strongly suggest the following:

1) **Take initiative** — You can learn a tremendous amount by taking initiative in a laboratory environment and going above and beyond what is expected of you. At Tech, we are blessed to have some of the finest and most knowledgeable faculty in the world, each of them an authority in their respective field. The post-doctoral fellows and PhD students present are very experienced in their field, and more than willing to help. With world class facilities in each lab, this can be one of the most enriching experiences of your undergraduate career.

2) **Be patient** — Research is a long drawn process, and good results can often take years to come by. In other words, there is a reason why a PhD takes four to five years! In spite of your best efforts, experiments may at times not yield the results you expect. Keep in mind that the average journal publication is the result of work over at least a few months, by researchers who have spent years investigating a particular field.

As a whole, my undergraduate research experience was one of the most rewarding of my undergraduate career. I was fortunate to be in a lab that was at the cutting edge of research and mentored by highly regarded academics. The research option in particular provided a great way to document my effort, and the structured environment was vital in putting a thesis together. The end semester presentation and poster competitions are a great way to showcase your effort, and help you learn how to ‘sell’ your work, an attribute very important in the research arena today.
U/G Research: Describe your role within your professor’s research and research group.

EP: My professors had several graduate students working on different research projects for them; I was mentored by my professors in the same way as their graduate students.

U/G Research: How key was your professional relationship with your mentor?

EP: Having a constant interaction with my research professors helped a lot in defining the direction of my research. Building a good professional relationship with my mentors was also helpful because I knew I can rely on them to provide me with references if I decided to apply to graduate school.

U/G Research: What are some of your other interests that may or may not have to do with your research?

EP: I am very enthusiastic about learning Spanish. I studied abroad in Buenos Aires, Argentina and would like to visit again. In the future I would also like to do volunteer work in South America.

U/G Research: Share an interesting fact about yourself.

EP: Math tutor for middle-school students in Atlanta’s public schools. I enjoyed mentoring students and seeing them work hard towards accomplishing their goals.

Faculty Corner

UROP Library

In our last issue we began highlighting several books and resources which are available for check-out from UROP. Three resources are available related to developing successful presentations of research, both oral and visual which may be helpful to your students.

Envisioning Information and The Visual Display of Quantitative Information by Edward R. Tufte. Tufte is considered by many to be a leading expert in the analysis of graphical information and visual display. Two volumes in our library provide tips and best practices on envisioning information. A wide range of examples are used in each volume to provide insight into his principles of visual display. Information on the integrity of graphical information, the design of graphics, and the best use of data and labeling are examples of items covered in the volumes.

The Craft of Scientific Presentations by Michael Alley. Alley’s work looks at the critical aspects of creating excellent presentations of scientific material including a speech’s actual content, the structure of a presentation, appropriate use of visual aids, and the choice of a delivery style. Examples in the book are organized around a set of critical errors in presentations and tips are available to avoid such mistakes. A checklist for presenters and information on how to create effective posters are also included in the appendices. The author uses real life examples of how presentations have affected major decision making, including the example of how a presentation which did not target its proper audience had major implications in the events leading up to the Challenger disaster. Additional titles are available.
News from the Director

The morning air has turned crisp, the time has changed, and the leaves are falling—all signs that the Fall semester is well underway. I invite you to enjoy the articles on several students and mentors in this November issue, including a profile on a student completing research while at Oxford University, an interview with a graduating senior in ISYE, information on GTRI’s Office of Policy Analysis and Research (OPAR), and personal reflections from a recent ECE Research Option graduate.

I also invite you to consider contributing to our new Undergraduate Research Journal, The Tower, either by submitting an article for publication, serving as a reviewer, assisting with production of the journal, or helping with publicity and marketing. The journal is a great opportunity for undergraduate students to obtain first hand experience in all the aspects of producing a peer-reviewed publication. The journal is also looking for additional faculty and senior-level graduate students to serve on its Review Advisory Board. For additional information, check out our article on Page 4 and visit the organization’s website at: http://gttower.org.

Also, watch for a new opportunity for undergraduates to present their research work—the new Undergraduate Research Presentation Series in the library. Presentation forums will be hosted several times per semester on various interdisciplinary topics including research from all disciplines on campus. Our first presentation this year will be on November 26th (see page 5). I invite you to drop by and learn more about the exciting research being performed by our undergraduates!

Best,
Karen Harwell

Let Your Voice Be Heard!!

Student Advisory Board for Undergraduate Research (SABUR)

The newly formed Student Advisory Board for Undergraduate Research (SABUR) works toward implementing new ideas for programs and resources for students interested in research. If you’re interested in serving on this board, please contact Dr. Karen Harwell, Director, Undergraduate Research at Karen.harwell@carnegie.gatech.edu. Freshman, sophomores, and juniors are particularly encouraged to become involved!

We want to hear from you!!

We are always looking for subject matter for our newsletter, including suggestions of students and faculty to profile and good news to share about student achievements, publications, and presentations. If you are interested in writing for the newsletter or have suggestions for future profiles, please contact us at urop@gatech.edu.

Listserv

To receive information and announcements from Georgia Tech’s Undergraduate Research Opportunities Program (UROP), join the urop-news listserv. To join, send an e-mail to sympa@lists.gatech.edu with a subject of "subscribe urop-news"