SURF, EARN, LEARN IN SUMMER

Summer Undergraduate Research Fellows Program

The Undergraduate Research Fellowship program, established in the spring of 2005, is dedicated to enhancing the academic lives of UAH engineering students by providing rising juniors and seniors with opportunities for participating in the research of scholars of UAH College of Engineering during the summer session.

SURF welcomes all students who have the potential and motivation to benefit from working with faculty and research staff as research assistants. The program has been designed to include partnerships between students and mentors, seminars on research-relevant issues, and practice in research presentations. The many benefits of the program are found in the fluid interaction between these activities.

The Research Fellow

The SURF program is intended to be a summer experience. Rising juniors and seniors in the College of Engineering are eligible to be SURF Fellows. The factors considered for admission include, UAH grade point average and enthusiasm about research. Admission is based on the student’s overall motivation and potential to benefit from the program.

The Research Mentor

The essence of the SURF Program is the Fellow/Research Mentor relationship and the opportunity it gives the student to engage in inquiry-based learning or creative work. The student scholar will gain experience in probing the unexplained, exploring the possible, and creating new knowledge. The impact can be profound and life changing. For researchers, the benefits of working with a SURF Fellow include sharing the excitement of research with a bright and eager future scholar, acquiring valuable research assistance, supporting an undergraduate’s exploration of academic and career interests, and connecting directly with the experiences of undergraduates on campus. The Research Mentor, or a graduate student or post doc under his/her supervision, will take an active role in the scholar’s Fellow experience.

Master of Science in Engineering Concentrating in Information Assurance Engineering

Information Assurance Engineering (IAE) is about developing computer networks, wired and wireless communication systems to remain dependable in the face of malice, error, and mischance.

As a discipline, IAE focuses on tools, processes, and methods needed to design, implement, and test systems and to adapt existing systems to survive in a hostile environment.

Students graduating with concentration in Information Assurance Engineering are expected to:

- Gain hands-on experience within the computer/network protection.
- Learn how to design and develop future trusted systems.
- Be well educated in the Cyber Trust area.
- Have ethical responsibilities to those who will manage, configure, and operate such systems, and to provide fundamental cyber security education for all citizens to secure systems of the future.

Students will learn about Information Assurance Engineering through hands-on courses in the Cyber Chargers Laboratory at UAH. The laboratory is a replica of the real world wired and wireless computer networks infrastructure.

This laboratory is considered to be among the top facilities in the nation giving UAH students opportunities to learn through hands-on education and research in information assurance engineering.
Summer Undergraduate Research Fellows Program

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The SURF student will be a rising junior or senior student, who most likely has had very little or no prior research experience. The Research Mentor will establish clear guidelines as to what the scholar is expected to accomplish/learn on his or her research project. To avoid later confusion, the Mentor and scholar will schedule periodic conversations about the scholar’s progress during the course of the semester.

The Interview Process

Finding a research position through the Summer Undergraduate Research Fellows program entails the student discussing the list of available opportunities with the Department Chair. Each Department has compiled a list of SURF Research Opportunities based on the submissions by Research Mentors. Students search through this list and select a research project that is interested to them. It will then be up to the student to contact the Research Mentor and set up an appointment to meet for an interview.

Students are usually surprised that they have to interview with a faculty or staff person – a prospective Research Mentor -- about the research or creative opportunity. Both students and Research Mentors have a choice about working together. It should be a mutual decision. Through the interview process, students and mentors will learn about each other, and students will learn more about what the mentor’s project entails, and the mentor’s expectations.

Mentors – if you are looking for a student that has specific skills or background, this is your opportunity to see if the student has the qualifications you desire. It is also an opportunity for students to have a chance to decide if your project fits their skills and interests.

The Application Process

Once the student and the Research Mentor have agreed on a Research Project, the student fills out an application and turns it in to the Departmental Office.

The Research Contract

After completing interviews with prospective Research Mentors and setting up research positions, all SURF students must work out the details of their new research project with their Research Mentors. Together, mentors and scholars must write these details on the SURF research contract. The contract should clearly outline specific tasks that will be the student’s responsibility and the number of hours per week the student is expected to work. Both, Research Mentor and SURF scholar must sign and date the contract.

Research Journal

Each SURF scholar is required to keep a journal. The purpose of this journal is to reflect upon their research experience – from the interview, the objective of the project, the highs and lows of the work, and how the student is feeling about the entire experience. We expect each student to write at least 1-2 pages per week. We want this to be both creative and analytical – but what’s key is the writing process. We want this to be an exercise that helps students in the meaningful interpretation and analysis of the research.

Research Abstract

Each scholar is required to write an abstract at the end of the semester that includes a clear succinct statement about what the research is about, any relevant background information about the project, a brief description of the methodology, preliminary results, anticipated relevance and applications and plans for future research. The Research Mentors will review their student’s abstract, to see that they have a clear understanding of the project.

Research Presentations

At the end of the summer, scholars give short oral presentations about their research work. The presentations offer the students an opportunity to share findings with their fellow scholars, get feedback on ideas, and share enthusiasm for the hard work they’ve completed. The presentations are a step toward developing personal presentation styles and empowering a self-image of being knowledgeable about the research work.
**UAH BalloonSat Program**

At UAH, students in Dr. John Piccirillo’s senior design class in the Electrical and Computer Engineering (ECE) Department have been designing, building, launching and recovering high altitude balloon payloads. These payload experiments typically reach altitudes around 100,000 feet, considered the edge of space, and travel downwind from 50 to 150 miles. These flights are made possible by a generous grant from the Alabama Space Grant Consortium to Dr. Charles Corsetti, which allows students to design, build, fly and operate a broad range of payloads.

Each balloon carries multiple packages and adheres to both FAA and FCC regulations. In addition to a payload, which carries the scientific experiments, a second package carries a GPS receiver and amateur radio communication gear. The communication package transmits position information and telemetry data from the payload instruments to mobile ground stations and also posts the information to the Internet in real-time. This allows students and interested observers to follow the location and the altitude of the payload throughout its entire flight of two to three hours.

After a launch the students, aided by the instructors, members of the Huntsville Amateur Radio Club, and individual volunteers then chase the balloon across the countryside, frequently into eastern Alabama and western Georgia, in an attempt to recover the payload. So far all 14 launch-payloads have been recovered successfully. The entire process of payload design, construction, launch, recovery and data analysis is accomplished in one semester by a team of four to five students.

The balloon scientific payloads have used a wide variety of sensors to measure and record the flight, including the earth’s magnetic field, high altitude cosmic rays, ozone levels, temperature and pressure, payload tilt and rotation, solar panel efficiency, ultraviolet light intensity, and speed of sound. In addition aerial imagery has been made with film cameras, digital still cameras, digital video cameras, and live coverage with transmission of television pictures.

As time goes on the payloads become more complex in design. “The BalloonSat program continues to be an exciting adventure,” according to Dr. Piccirillo, the class instructor. “The quality and complexity of the student designs is high and the cross-country recovery chase is a lot of fun”

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**Larry Levitt Receives 2004 SBIR Award**

Larry Levitt, Government civilian with the U.S. Army Aviation & Missile Research, Development, & Engineering Center (AMRDEC), recently won one of the 2004 Small Business Innovation Research (SBIR) Awards for his role in initiating and managing an ultra wideband (UWB) communications project.

The award was presented at the Pentagon in August 2004 by Dr. John Parmentola, Director for Research and Laboratory Management, Office of Deputy Assistant Secretary of the Army for Research and Technology.

The following description appears in the Army’s 2004 Quality Awards brochure:

“A reliable communications link to transmit data and video that is covert and immune to multipath interference is essential to realizing the full operational potential of military and commercial Unmanned Aerial Vehicles (UAVs). Time Domain Corporation (TDC) successfully demonstrated the transmission of live video from a UAV nose-mounted camera to a ground station at ranges up to 800 meters using ultra wideband (UWB) radios as the link. TDC also demonstrated a communications relay link using three UWB radios to transmit over a distance of 1.5 kilometers. This radio relay capability allows for rapidly deployable, covert, robust non-line-of-sight communication networks for military and commercial applications.”

Larry Levitt received a B.S. in E.E. from UAH in 2001, and is currently a graduate student in E.E. at UAH.
Dr. Charles Corsetti  
Lecturer & Assistant Chair

Dr. Corsetti serves as Lecturer and Assistant Chair of the Department. He teaches courses in electrical circuits, signals and systems, and supervises the EE Senior design projects. His major responsibilities are to serve as an advisor to the department's undergraduate students and to conduct activities for undergraduate student recruitment and retention.

Jo Ferrando  
Staff Assistant

As Staff Assistant, Jo's duties include preparing draft and final copies of professional conference manuscripts and proposals submitted electronically to NSF and NASA, formatting camera-ready technical papers for professional journals, and scanning documents, graphics, and photos for the ECE Dept.

Linda Grubbs  
Sr. Staff Assistant

As Senior Staff Assistant, Linda's duties include: Scheduling classes; ordering textbooks for the department; distributing and preparing student evaluation forms for processing at testing services; maintaining undergraduate student files and assisting in the preparation of paperwork for graduation; maintaining staff time sheets and absence record files; assisting the chairman with appointments and various tasks. Linda is also the ECE Webmaster and the Editor of Real Time, the ECE Department newsletter.

Dennis Hite  
Sr. Lab Manager

As Senior Lab manager, Dennis's main duties are acquiring and maintaining the test and measurement equipment and computer systems in the department's instructional laboratories. He also maintains the Faculty and Staff office computers. Other duties include assigning duties to and over seeing daily activities of the department’s Graduate Teaching Assistants. As time permits he also assists Faculty and students with their laboratory course material and projects.

Angelia Heulett  
Staff Assistant

As Staff Assistant, Angelia is ECE's ABET coordinator and is also responsible for all PAF's, Timesheets, Retro's and PAR's for the ECE Department which includes full-time and part-time faculty, staff, undergraduate students, GTA's and GRA's.

Laurie Schmitz  
Staff Assistant

As Staff Assistant, Laurie's responsibilities include: Budget Coordinator, Purchasing, Expeditor, Shipping and Receiving, Inventory Control, Travel, and Trouble Shooter for ECE Department.

Jackie Siniard  
Sr. Staff Assistant

As Senior Staff Assistant, Jackie is responsible for the department’s graduate students and ADTRAN TDP students; offer letters for GTA's/GRA's; assisting the chair with recruiting faculty and graduate students; appointments for the chairman; email inquiries re grad studies; general office duties, and assisting the chair with faculty nominations.

Jason Winningham  
Computer Systems Engineer

As Computer Systems Engineer, Jason's primary responsibilities are the administration and maintenance of the College of Engineering's Unix web, email, file servers, and the Sun labs. In addition, he manages the NT domain for the ECE Department and assists in providing PC support as needed.
Research Abstracts

Research abstracts are stand-alone statements that briefly, but specifically, describe research projects. Research abstracts are most commonly encountered in scholarly journal publishing where abstracts are included at the beginning of an article.

In this instance, the abstract is a summary of the research being reported in the article and includes the research question, the research methodology and the general research findings. The article then describes all of these topics in detail. Abstracts of researchers who have presented their research findings at national and international conferences are also published as part of the proceedings of the conference.

Because research abstracts are an integral part of the way research faculty share their research activities, SURF students are assigned the end of term project of writing an abstract about their own research project.

Prepare for this Assignment

Students will need to have a good understanding of their own research project in order to write a good abstract. This may entail doing some background reading about the nature of the research question being investigated or related research studies done prior to the current research project. Usually students find it both helpful and necessary to initiate a conversation with the faculty sponsor to help explain the project's hypothesis and research methods.

Once the necessary information is gathered, the next step is drafting the abstract. The abstract writing style is usually dictated by the research discipline and/or the guidelines provided by a journal publisher. It may be helpful to read sample abstracts to understand the writing style. The essential parts of an abstract should include statements about the following:

- The research question, hypothesis or purpose of the research
- The research methodology
- The preliminary findings and/or results of the investigation
- The conclusions or possible application of the research

The abstract should be written in third person voice and should not include personal references or names. The writing style should be concise and to the point. Very little explanation or further description is required. The total number of words should not exceed 250. Students are encouraged to read a variety of abstracts to understand the writing style. Abstracts can be found by browsing current research journals available in any of the University libraries.

Writing a Research Abstract

Research abstracts are used throughout the research community to provide a concise description about a research project. As part of your experience, you will be asked to write a research abstract describing the research project in which you participate.

Once you have written this abstract, you will find many ways to use it. For example, you may wish to give it to a potential employer to help illustrate your resume. Some students present their research findings at local and national conferences. Research abstracts are usually requested as part of the application process for conference presenters.

Here are a few resources to help you understand what a research abstract is, how it is used by researchers as well as guidelines for how to write a good abstract:

- Abstracts, Summaries and Creative Statements by Hilton Obenzinger, Stanford University
- How to Write an Abstract... URC, University of California, Davis
- ASA Writing an Informative Abstract The American Sociological Association
- Abstracts, by John December and Susan Katz. The Writing Center at Rensselaer Polytechnic Institute

CoE SURF: Sample Research Abstract


An ergonomic study was conducted to improve the workstations for electrical tests in a printed circuit assembly (PCA) factory in an industrially developing country (IDC). Subjective assessment and direct observation methods were used on the operators to discover the problems in their workstations. The problems found were: (i) poor workstation design, (ii) mix-up of tested and untested boards, (iii) missing or incorrect test steps, and (iv) unclear pass/fail color inspection criteria. Ergonomic interventions implemented were:

(i) an improved workstation with space for resting arms and the oscilloscope and computer keyboards within easy reach of the operators; (ii) clear segregation of tested and untested boards to prevent mix-up; (iii) retraining of operators by more qualified trainers; and (iv) reference color samples for more effective recognition of different colors in the projection screen. The results were average savings in yearly rejection cost (of US$574,560), reduction in rejection rate, increase in monthly revenue, improvements in productivity, quality, operators’ working conditions and occupational health and safety (OHS) and enhancement in customers’ satisfaction. The cost of the interventions was less than US$1100. The interventions implemented were simple and inexpensive but resulted in many benefits.
Laboratory News...

Dennis Hite,
ECE Lab Manager

As some of you may be aware, the Cyber Chargers Lab is up and running. The lab supports the Information Assurance Engineering courses and will also support the new network labs starting in Fall 2005. We have invested close to $200,000 outfitting the laboratory to replicate a "real world" wired and wireless information network infrastructure.

The lab includes 20 Pentium 4 workstations capable of running multiple operation systems including Windows and Linux. In addition there are 5 Windows, 5 Linux, and 5 Unix servers. The lab contains both Cisco and ADTRAN switches, routers, firewalls, and VPNs. The equipment can be configured to create a exclusive Cisco, exclusive ADTRAN, or mixed WAN environment. I would like to extend a special thanks to Dynetics, Inc., ADTRAN and the ECE faculty and staff for their support in this project.

Computer Password Security

Some password security notes: Passwords should never be written down, emailed, saved on your computer, or given to anyone else. Your system administrator does not need your password for any system maintenance reasons; please don’t email it when reporting a problem.

Passwords that are saved by applications (such as an email tool or web browser) may be stolen by adware, spyware, a worm, a virus, or some other attack. Allowing an application to “remember” a password is poor computer security practice.

The Laboratory for Microcomputers has acquired a dozen development/prototyping boards MSP430-easyWeb2 from Olimex (http://www.olimex.com).

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To report computer problems and get answers to frequently asked questions, visit the Engineering computer support web site at http://support.eng.uah.edu
New ECE Lab Computer Access Policy

A new policy is in effect beginning with the Spring 2005 term for ECE labs. All computer access will require a personal username and password.

We have relied on physical security in the past - access to the computer was restricted by controlling access to the lab in which the computer is located. The new policy adds another level of security, allows better access control and accountability, and allows a uniform policy for all ECE labs.

Lab instructors are given a list of usernames on the first day of class. Students should obtain their username from the lab instructor. The standard username is the first 6 characters of your last name, followed by your first initial, possibly followed by your middle initial or a digit as required to make a username unique. For example Jane User would have the username userj, while Joe D. User would be userjd.

The default password will be your first initial, last initial and the last 6 digits of your student ID. For example Joe D. User with ID 123-45-6789 will have the password ju456789. Note that the letters are lower case and passwords are case sensitive. Users are encouraged to change this default password.

Students who register late or change sections after classes have begun may have problems. If you have problems getting access to your account, especially if you have registered late or changed sections, talk to your lab instructor.

If you have an account but have forgotten your password you must bring your UAH Student ID (Charger Card) to EB237. No other forms of identification will be accepted. If you do not have a Charger Card contact Charger Central to obtain one.

-Jason Winningham
ECE Computer Systems Engineer

How to Change Your Engineering Email Password

Need to change your Engineering email password? There are a couple of ways to accomplish this.

One way is to use the Engineering webmail server. Use a web browser to connect to the Engineering webmail server at https://webmail.eng.uah.edu (note the "s" in https; this denotes a secure connection).

- At the login screen, enter your username and password. Your username is the part of your email address before the @
- At the top of the main pane, click on the "Options" link
- On the Options page, click on "change password" (you may need to scroll down)
- Fill in the blanks and click "submit"
- Click "Sign out" when you are finished

Another way is to log in to one of the Engineering Suns. Either go to one of the Sun labs (EB216 or EB246) or log in to eng.uah.edu using ssh. If you log in directly to a Sun in the lab, open a terminal window and get to a command prompt.

After you log in, type the command passwd and follow the prompts. Here's an example:

    ray $ passwd
    Enter login(NIS) password:
    New password: [enter]
    Re-enter new password: [enter]
    NIS passwd/attributes changed on ray
    ray $

Choosing Good Computer Passwords

Your computer password is important because it is the first line of defense for the system. If your password is stolen or "cracked" an intruder can get access to the system as you, read your email, send email as you, use this access to attempt to gain more access (to the email and data files of other users, for example), or to simply launch another computer attack as you.

What is a good password? For a password to be secure, it should be hard to guess, easy to remember, and changed regularly.

In order for a password to be hard to guess (a "strong" password), it should:
- Be at least 6 characters long
- Contain both upper and lower case letters
- Contain digits and punctuation marks
- Not be based on any personal information
- Not be based on any dictionary word, in any language

One method for creating a password that has these characteristics and is something easy to remember is to make up a sentence and use the first letter of each word, as well as the punctuation. For example, the sentence "My dog has 4 fleas." would generate the password Mdh4f. (note the period on the end of the password). This password has all of the features we want for a hard to guess password, and it's pretty easy to remember the passphrase that we used to generate it.

Passwords should be changed at least every 30 to 90 days, and should be changed immediately if you think your password has been compromised.
42nd ACM Southeast Conference

The 42nd ACM Southeast Conference 2004 (ACMSE '04) was held on April 2nd and 3rd, 2004 in Bevill Conference Center of UAH with 140 attendees. This conference was co-hosted by Electrical and Computer Engineering Department and Computer Science Department of UAH (organized by Drs. Seong-Moo Yoo/ECE and Letha Hughes Etzkorn/CS). Nine papers from ECE Department were accepted. Many CPE faculty members contributed their time as program committee members and paper reviewers. Many ECE students volunteered to take care of conference registration and computer projectors/lap tops.

ACMSE '04 received 134 short and full paper submissions covering all areas of computer engineering and computer science. After a thorough review process by 71 reviewers, 99 papers (26 short papers and 73 full papers) were accepted. This year's conference included a Special Session on Mobile Computing, and a Special Session on Software Systems. There was also an Animation Festival after dinner on the first day of the conference. During the lunch of the first day, a tutorial was provided by Dr. Jose Garrido, Kennesaw State University on “Constructing Object-Oriented Models of Discrete Event Simulation Using Java”. In addition, the first, second, and third student papers were recognized.

The ACMSE is hosted, on a rotating basis, by various universities in the Southeastern US. However, participants in the ACMSE come from throughout the US and from many countries abroad. The proceedings of the conference, containing all the papers accepted, were published in a 483-page bound volume. All papers in the proceedings will appear in the ACM Digital Library.

The first conference of ACMSE was held in 1962 at Ft. Walton Beach, Florida, and UAH hosted the 8th conference in 1969 (organized by Drs. Leland Williams and Charles Bradshaw). The 2005 conference shall be held in Kennesaw State University, Kennesaw, Georgia.

ECE Papers Presented at ACMSE '04

8. “Motion Estimation with Integrated Motion Models” by Mahesh Nalasani, W. David Pan, and Seong-Moo Yoo.

Dr. Sam Yoo
Associate Professor

Journal Articles


Other 2004 Student Publications


Dr. Laurie Joiner  
Assistant Professor

Dr. Emil Jovanov  
Associate Professor


Dr. Alex Milenkovic  
Assistant Professor


Dejan Raskovic (Principal Investigator), A. Milenkovic (Co-Principal Investigator), E. Jovanov (co-Principal Investigator), D. Thorsen (co - Principal Investigator), “Energy-Efficiency In Distributed Sensor Networks,” 10/01/04 – 30/09/05, NSF Award no. IIS: 0434156.

Dr. David Pollock  
Assoc. Research Professor


Dr. David Pan  
Assistant Professor


Conference Papers


Congratulations, Dr. Shtessel, on your promotion to Associate Fellow in the AIAA.

The American Institute of Aeronautics and Astronautics (AIAA) has been technical society devoted to continuing contributions and global leadership in the aerospace community for 75 years.

Journal Articles


Conference Papers


Conference Papers


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Conference Papers


Hand-on courses in Information Assurance Engineering are being taught in the

**Cyber Chargers Lab**

a Dynetics Supported Information Assurance Engineering Laboratory

Students graduating with concentration in Information Assurance Engineering are expected to:

- Gain hands-on experience within the computer/network protection.
- Learn how to design and develop future trusted systems.
- Be well educated in the Cyber Trust area.
- Have ethical responsibilities to those who will manage, configure, and operate such systems, and to provide fundamental cyber security education for all citizens to secure systems of the future.

For more information on Information Assurance Engineering courses, visit

[http://www.ece.uah.edu/programs/IAE.htm](http://www.ece.uah.edu/programs/IAE.htm)

**Here are some options:**

**Undergraduate students** can become familiar with information assurance engineering by taking introduction to computer networks and introduction to information assurance engineering.

**Graduate students** have the opportunity to take advanced courses from the following list:

- Introduction to Computer Networks
- Advanced Computer Networks
- Introduction to Information Assurance Engineering
- Wireless Computer Network Security
- Advance Information Assurance Engineering
- Real Time Operating Systems
- Introduction to Data Communication Networks
- Engineering mathematics courses
- Management courses
- Engineering Management
- Engineering Project Management
- Financial Methods for Engineering
- Electrical Engineering Capstone courses

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**We want to hear from you!**

The ECE Department looks forward to hearing your views and your success stories. Contact us to share your news and comments about your career and interests. Your story should be sent to realtime@ece.uah.edu

UAH

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