

National Aeronautics and Space Administration



NASA ROBOTICS ACADEMY AT MARSHALL SPACE FLIGHT CENTER



PROFILE BOOK 2008



Michael Griffin, NASA Administrator

NASA's Strategic Goals

- Fly the Space Shuttle as safely as possible until its retirement, not later than 2010
- Complete the International Space Station, accommodating international partner commitments and human exploration
- Develop a balanced overall program of science, exploration, and aeronautics consistent with the new focus on human exploration
- Bring a new Crew Exploration Vehicle into service after Shuttle retirement
- Encourage partnerships with the emerging commercial space sector
- Return to the moon and make it a base for later missions to Mars and beyond

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Program Description

The NASA Robotics Academy is an intensive resident summer program of higher learning for college undergraduate and graduate students interested in pursuing professional and leadership careers in robotics-related fields.

The NASA Robotics Academy program is designed to present a comprehensive package of information and experiences about the organization of the NASA Agency, some of its most important current and planned science, engineering, education, and technology enterprises, as well as a number of non-technical areas of critical significance. Besides attending lectures and workshops with experts in their field, the Robotics Academy students are involved in supervised research in a MSFC laboratory, and will participate in visits to other NASA Centers and a number of robotics-related academic laboratories and industries.



Eligibility, Selection Criteria, and Placement

The participants in the Marshall NASA Robotics Academy have been selected based on the following criteria:

- US citizenship or permanent residency
- Research Associates: Rising college freshman
- and sophomores
- Team Leads: Junior/senior undergraduates or
- graduate students
- High academic standing (GPA 3.0 or higher)
- Demonstrated prior involvement in robotics
- Propensity for teamwork

Both the selection process and placement of the Academy participants in Marshall's research groups were assisted by recommendations from faculty, administrators, academic supervisors, and co-workers, and the applicants' self-profiling essays.



Surface Mobility Systems

This Robotics Team of the MSFC Robotics Academy is working with the Surface Mobility group on teleoperated and autonomous ground robots. Several projects are being worked on in the Surface Mobility lab, including autonomous rendezvous and docking of a large mobile platform, called the R-Gator, and improving a small mobility platform called the MARCbot.

A good portion of the summer will be spent modeling and simulating the surface rendezvous and docking of the R-Gator to a utility trailer. The R-Gator is a joint project between John Deer and iRobot. It is a diesel gator modified with LIDAR sensor, ranging sensors, cameras, and a computer to be able to navigate autonomously. The docking sensor is a NASA design. It uses a camera with a laser attached as the active part of the sensor. This is capable of tracking a reflective target mounted on the trailer and giving orientation information to the computers controlling the R-Gator. This information will be supplemented by pictures from a UAV that has flown over the target site. Several MARCbots will then take a closer look at the trailer.

The modeling of the R-Gator, trailer, UAV, and MARCbots will be done in a software package called RoboSim. This software uses the LISP programming language to create 3-D models, actuators, and simulate the movements. Positions returned from a kinematic model of the robots will be fed into RoboSim. Putting all these elements together will give a full visualization of the scenario and will allow the control systems and software to be debugged. Depending on the amount of time we have, we will also be working with the robot hardware.

Principal Investigator: *Ken Fernandez*

Team Lead: *Paul Drews*

Research Associates: *Maegan Grady
Robert Rucker
Jessica Tham*



Paul Drews

Missouri University of Science and Technology

Rolla, MO

Computer Engineering,

Electrical Engineering

Bachelor of Science 2008

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Research and Experience

- **OURE Fellows Research Grant:** 2007 – 2007 School year
 - Created a small autonomous helicopter with a team of four
 - Worked to create a control system and electronics payload
- **Garmin Intern – Software Engineer:** Summer 2007
 - Made improvements and fixed bugs in Garmin System tester
 - Creatively added functionality to existing products
 - Worked in a team environment and set priorities
- **Boeing Intern – Software Engineer:** Summer 2006
 - Created a server to interface with a MIL-STD 1553 bus over TCP/IP
 - Wrote hardware interface to PCI card using existing driver library
 - Created real-time software using interrupt driven processing

Membership and Activities

- **UMR Robotics Team:** 2005- 2008
 - *Lead Electrical Engineer:* 2007 – 2008
 - *Chief Engineer:* 2006 – 2007
 - *Vice President:* 2005 – 2006
- HKN Electrical and Computer Engineering Honor Society
- Missouri Scholars Academy: 2002

Honors and Awards

- OURE Fellows research grant recipient



Special Skills

- Computer Languages
 - Visual Basic
 - C/C++/VC++
 - 8051 assembly
 - Python
- Software Tools
 - Embedded Software
 - MS Windows and Linux
 - MS Office
 - Linux Software Development
- Electronics
 - 8051 based microcontroller systems
 - Atmel AVR system design
 - PIC and 68HC11 systems
 - PCB design and layout

Hobbies

Mountain and road biking, camping, remote control cars and planes, model trains, video games, frisbee, paintball, dirt bike/four wheeler riding

Personal Statement

I have always had a passion for robotics. In high school, I did a lot of experimenting and hobby robotics on my own. During my time at Missouri University of Science and Technology I spend a great deal of time outside my classes working on robotics. I spent three and a half years working on the robotics team building several different robots for the Intelligent Ground Vehicle Competition and helping lead the team. I also worked for two years on a research project to create a small electric helicopter control system. These experiences taught me a great deal about robotics and project management in general. It also convinced me that I would like to continue my education in robotics and electronics. I would like to go on and get my masters and possibly a Ph.D. Ultimately, I would like to work on autonomous robotics and create new applications on and off this planet for intelligent systems.

While I am not working or playing with robots, I have many hobbies and pastimes. Recently, I have taken an interest in bicycle racing. I race both road and mountain bikes, and have done well in several collegiate road races over the past semester. When I am not biking, I like to be outside camping, hiking, or just running around in a park. I also enjoy remote control airplanes and cars, and have several. When I have the time, I enjoy a good science fiction or fantasy book, and play my fair share of video games.



Maegan Grady

Saint Mary's College, University of Notre Dame

Notre Dame, IN
Mathematics,
Electrical Engineering
Bachelor of Science 2010
Bachelor of Science 2011
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Research and Experience

- **Programming Project:** Nov. 2007 – Dec. 2007
 - Designed a game where a user would dock a spaceship into the space station following physical rules and constraints to win
 - Worked to create a control system and electronics payload
- **A.C.C. Mentoring Program – Member:** August 2005 – May 2006
 - Group of students designed condominiums in Florida to withstand hurricanes, earth quakes, and other various environmental elements
 - Designed for students to receive training in the fields of architecture, construction and engineering
 - Won scholarship for outstanding performance and contribution to group
- **Helpdesk Consultant:** Jan. 2007 – present
 - Assist professors with computer problems
 - Communicate issues and solutions over phone
- **Resnet Consultant:** Aug. 2007 – present
 - Assists students with computer issues and problems with as viruses, internet, email, wireless, and printer.

Membership and Activities

- Society of Women Engineers
 - President: April 2008 – present
- People to People
 - Student Ambassador
- Math Club
- YMCA Nashville, TN
 - Lifeguard: July 2003- present
 - Swimming Instructor: May 2006 - present



Honors and Awards

- A.C.E. Scholarship for outstanding performance
- College Honor-roll, fall 2006

Special Skills

- Software Tools
 - MatLab
 - Maple
 - SAP 2000
 - MS Windows and Mac
 - MS Office

Hobbies

Swimming, dancing, teaching, climbing, running, watching movies, bowling, using the internet, boating, and skating

Personal Statement

I am originally from New Hampshire, but have since moved to Tennessee. I am one who loves to lead as well as work side by side with others. I was involved in my high school's marching band for four years as a colorguard member. The fourth year I was selected captain. During my freshman year of high school I participated in the schools nationally known winter drumline. Senior year I was president of SADD and a member of A.C.E mentoring program, in which I was awarded a scholarship for dedication. In college I have been involved with several different clubs. I am part of the college dance team, as well as the captain. Further, I am involved with the Society of Women Engineers and was nominated as President for the 2008-2009 academic year.

I have always been interested in NASA and have always dreamt of working with them. Having this summer to work on robotic systems will help guide me to where I want to be. I became interested in electrical systems when I was assigned a project based off of the work being done on the IBM millipede. I have always been curious as to how computers, ipods, phones, calculators, and others were created.



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Electrical Engineering
Bachelor of Engineering 2010
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Robert Rucker



Research and Experience

- **Advanced Engineering**: – *Intern*: Summer 2007
 - Fabricated controls for various clients, including Bridgestone, Mars Pet Care and PermaPipe
 - Fabricated panels and mounted PLCs on panels
 - Programmed PLCs in RSLogix using Ladder Logic programming
 - Helped draft panel tags using AutoCAD
- **Vanderbilt Career Center** – *Peer Career Advocate*: Aug. 2007 – Dec. 2007
 - Acted as photographer for Industry Career Fairs
 - Maintained VCC website using SiteMason CMS
 - Gave presentations to students on how to attain a good job and start a career in a field the students will enjoy

Membership and Activities

- **Vanderbilt Student Volunteers for Science**: 2006 - present
 - *Team Lead*
- **Habitat for Humanity**
 - *President*

Honors and Awards

- Deans List: 2006 – present
- Phi Eta Sigma National Honor Society
- Dillard Jacobs Scholarship

Special Skills

- Computer Languages
 - HTML
 - Java/JavaScript
 - Ladder Logic
 - Assembly



- Software Tools
 - AutoCAD
 - MATLAB
 - MS Office Professional
- Electronics
 - Circuit design
 - Digital logic
 - Programmable Logic Controllers (PLCs)

Hobbies

Reading, ultimate frisbee, bowling, movies, hiking, video games, biking

Personal Statement

Space travel and space research have always been big interests of mine. I graduated from Brentwood High School in 2006 and headed to Vanderbilt University for my undergraduate. In high school, I was a member of Key Club and National Honor Society, as well as president of Habitat for Humanity. When I am at college, I am a member of Vanderbilt Students Volunteering for Science, a group that goes to middle schools in Nashville and teaches science labs, giving the teachers a break and getting students interested in sciences. I am also a member of the Wesley/Canterbury Fellowship.

My highest aspiration, career or otherwise, is to go into space. My more immediate plans include finishing my Bachelor of Engineering in Electrical Engineering with a minor in Astronomy, and having a good bit of fun while learning along the way.



Jessica Tham

Louisiana Tech University

Ruston, LA

Mechanical Engineering

Bachelor of Science 2010

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Research and Experience

- **M. L. Smith, Jr., Inc. - Mechanical Engineering Intern:** Summer 2007
 - Estimated for steel and refractory, limited estimate for heat transfer through materials, attended minor job walks, submitted proposals, gained general knowledge of contract law, limited AutoCad 2002 use
- **Area Health Education Center(A-HEC) – Volunteer:** Summer 2004
 - Shadowed nurses in several departments at Lincoln General Hospital and Healthsouth Rehabilitation Center
 - Received health credit while taking a class that was a part of the program
 - Also received Outstanding Student Volunteer Award elected by other volunteers and staff

Membership and Activities

- Engineering and Science Association: LA Tech – ESA
- American Society of Mechanical Engineers
- Society of Women Engineers
- Louisiana Tech Amateur Radio Club
- Louisiana Tech Band of Pride
 - Marching Band – Clarinet Section Leader
 - Hoop Troop, Concert Band, Symphonic Band, and Wind Ensemble
 - Orchestra - Volunteer



Honors and Awards

- Outstanding Student Volunteer Award, A-HEC

Special Skills

- Computer Languages
 - PSPICE
- Software Tools
 - AutoCAD
 - MathCad
 - MS Office
 - Solid Edge

Hobbies

Marching band, video games, reading, amateur photography ,hanging out with friends, swimming, walking.

Personal Statement

I was born in Mississauga, Ontario, Canada and have lived in Michigan, New York, and Louisiana. I graduated from Ruston High School with honors and decided to attend the local university Louisiana Tech. I am a junior Mechanical Honors Engineering major who loves being a part of the marching Band of Pride. What engineering and band have in common is teamwork and leadership. I love being a part of a group working together to achieve a goal. Being drum major, section leader, and library manager in high school and section leader in college has shown me what it takes to be a leader of a team. It is very satisfying to work with the group you are leading and watch them pull together through hardships and try to overcome Murphy's Law.

My interest in space exploration actually started when I was younger watching Star Trek and Star Wars. I love the concept of discovering what or who else is out there and being able to make first contact. My ultimate life goal is to still be alive and kickin' when we as a human race develop force field, transportation, and warp technology. After all, Space is the "final frontier", so let's explore it together.



Automatic Rendezvous and Docking

The Automatic Rendezvous and Docking (ARD) team will be performing research on a project supervised by the Automated Rendezvous and Capture group at the Marshall Space Flight Center. Specifically, the group will be working on modifying the existing architecture for a Large Mobile Platform (LMP) and updating the control system and sensors to modern technology. Control software will be updated to record usage statistics such as maximum speed, maximum float duration and payload weight during simulations. Functionality to read and run scripts as well as help users redistribute and balance payload weight on the air sled will also be added.

Currently the vehicle operates on an 84' by 44' epoxy "Flat Floor" housed in the Flight Robotics Laboratory at MSFC. Using compressed air, the LMP floats on a small cushion of air and uses its eighteen thrusters to translate and rotate. The LMP is equipped with gyros, accelerometers, and a space tested VGS in addition to laser range finders to obtain position, acceleration and velocity measurements on the floor relative to its environment. Using the Advanced Visual Guidance System and corner-cubes, the LMP can determine its position relative to a docking station on the edge of the floor. This information is recorded and analyzed using one on-board laptop computer. A second computer, also on-board, is then sent this data and then using a second program automatically docks with the docking station in real-time.

Principal Investigator: *Linda Brewster*

Team Lead: *Nathan Brooks*

Research Associates: *Josh Calnan*
Elhanon Hall
Crystal Slavens



Nathan Brooks

University of Tulsa
Tulsa, OK
Computer Science
Electrical Engineering
Bachelor of Science 2009
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Research and Experience

- **Autonomous Robotics research:** Nov. 2007 – present
 - Research panoramic stitching algorithms for an aerial surveillance robot
 - Research feature matching algorithms to identify damaged buildings from aerial images
- **NanoJapan– NSF research participant:** Summer 2007
 - Performed research in fabrication of InAs ballistic rectifiers in a Japanese laboratory
- **Challenge X – Programmer:** Nov. 2006 – May 2007
 - Program Controller Area Network to monitor fuel cell data and provide fuel cell diagnostic information
- **Tulsa Undergraduate Research Challenge – Optics Lab**
Researcher: Summer 2006
 - Conduct experiments with lasers to optimize mobile free space ad-hoc optical networks
 - Use mathematical theory to complement experimental data

Membership and Activities

- **Engineering and Natural Sciences**
 - *Council Treasurer:* 2007 - 2008
- **Habitat for Humanity**
 - *Treasurer:* 2007 – 2008
- **Institute of Electrical and Electronics Engineers**
 - *Council Treasurer:* 2007 - 2008
- **LanBrew:** 2005 – present
 - *President*



Honors and Awards

- Eta Kappa Nu
 - President: 2007 - 2008
- Goldwater Honorable Mention: 2008
- Phi Eta Sigma, Lantern and Mortar Board
- Commended Nation Merit Scholar
- Tau Beta Pi

Special Skills

- Computer Languages
 - BASIC
 - C/C++
 - Java
 - LISP
- Strong knowledge of computer hardware, assembly and debugging

Hobbies

Conversations, piano, video games, reading outside (any genre), building stuff, swimming, soccer and bad puns.

Personal Statement

I grew up in Euless, Texas as the middle of three children, fascinated by LEGOs and computers. As an IB diploma recipient, I enrolled at the University of Tulsa and quickly found enjoyment working with both hardware and software. Turning to robotics as a union of the two (and other) fields, I served as a mentor for FIRST Robotics teams #31 and #1209, and gained first hand experience of working in a multidisciplinary environment. In the summer of 2007, I participated in Rice University's NanoJapan program and discovered my passion for working in a research environment and Japanese society. One of the things I enjoyed most about working in a graduate research lab was being surrounded by people always thinking of new ways to improve things, even for subjects outside of their field. After earning my bachelor's degrees in electrical engineering and computer science, I plan on enrolling in a robotics PhD program and focusing my studies in autonomous robots operating in hazardous or foreign environments. I hope to return to Japan one summer and continue robotics research through the NSF EAPSI program.

Outside of academia, one of my favorite activities is talking with people. As an officer in campus organizations like Habitat for Humanity, LanBrew, Eta Kappa Nu, IEEE and ACM, I enjoy creating and participating in events that bring together like-minded people to have fun and accomplish great things.



Joshua Calnan

University of Kentucky

Lexington, KY

Mechanical Engineering

Civil Engineering

Bachelor of Science 2010

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Research and Experience

- **Mitchell Community College Projectile Society:** 2005 - 2006
 - First place trebuchet team 2005, 2006
 - Team Leader, Large High Power Rocket Team
- **Calnan Lawn & Landscape:** 2005-current
 - *Owner/proprietor*

Membership and Activities

- **Mitchell Community College Projectile Society:** 2007- present
 - *Co-Captain*, Trebuchet team: 2005
 - *Team member:* 2006
- **National Technical Honor Society:** 2005 – 2006

Honors and Awards

- FFA Greenhand Degree
- FFA Star Chapter Agribusinessman
- United States Achievement Academy: 2004 – 2006

Special Skills

- Computer Languages
 - Visual Basic
- Software Tools
 - Adobe Photoshop
 - AutoCAD
 - Microsoft Office
 - Rhino
- Welding
- Metal Fabrication



Hobbies

Four-wheeling, landscaping, amateur rocketry, R/C vehicles, using the Internet, building and designing stuff, hanging out with friends, watching movies

Personal Statement

I grew up in a small farming community east of Syracuse, New York, before moving to another small town in North Carolina seven years ago. Fixing, building, and designing things has always been something I have loved. Whenever I wasn't in school I was either helping my dad outside or riding around to farms and construction sites with my grandfather to fix broken equipment. After moving to NC I began working with a few landscaping companies. Eventually I started my own company which I have now been running for three years. In high school my drafting teacher convinced me to pursue mechanical engineering and I joined the Junior Engineering Technical Society (JETS club) which he advised. After graduating from North Iredell High School in 2006, I went to Mitchell Community College where I was a member of the Projectile Society. During my time in these two clubs I helped build, and was the project leader of, two pumpkin chunkin' trebuchets and a high power amateur rocket. I received my Associates of Science in Pre-Engineering from MCC in spring 2007. This fall I will be transferring to the University of Kentucky to dual-major in Civil and Mechanical Engineering. I plan to continue my education afterwards and work towards my Masters and a Ph.D.

I have always been a person to go after what I want and I don't give up until I succeed. I enjoy working towards a goal, even when I am told it can't be done. I've been told my persistence is one of my best qualities, but I think it also gets me into trouble. I am definitely stubborn and sometimes don't step down when I should. But because of this, if I say I will find a solution to a problem, you can count on it being done.



Elhanon Hall

Georgia Institute of Technology
Atlanta, GA
Mechanical Engineering
Bachelor of Science 2012
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Research and Experience

- **FIRST Robotics Team 233:** 2005 – 2008 School year
 - Alliance Captain at World Championships: 2007, 2006
 - Information Technology Group Animator: 2006, 2007
- **FIRST Lego League:** 2003 – 2005 School year
 - Four person team won first place for research and presentation: 2004
- **Burnett Honors College – Intern:** Summer 2006
 - Studied Java and cryptography

Membership and Activities

- **Cocoa Beach High School Academic Team:** 2008
- **Cocoa Beach High School Christ on Campus**
 - *Assistant Leader:* 2008
- **Chess Club:** 2005 – 2008
- **Club Zion Community Church Youth Group:** 2005 – 2008
 - *Teacher, Youth Leader:* 2008
- **Cocoa Beach High School Fellowship of Christian Athletes (FCA):** 2005 – 2008

Honors and Awards

- **Mu Alpha Theta:** 2006 – 2008
 - *Co-Treasurer:* 2006
- **National Honor Society:** 2005 - present

Special Skills

- **Computer Languages**
 - Java

Hobbies

Reading, writing, learning, robotics, hanging out with friends, going to the movies, traveling, listening to music, teaching, designing things.



Personal Statement

I just graduated with honors from Cocoa Beach Jr./Sr. High School in my home town of Cocoa Beach, Florida as an International Baccalaureate candidate. I grew up in a house surrounded by science and technology, not only because I lived 20 minutes away from NASA's Kennedy Space Center, but also because my parents have both worked in aerospace in conjunction with NASA. I will also be attending the alma mater of both of my parents, the Georgia Institute of Technology, and studying mechanical engineering. In high school, my defining extracurricular was my work on my FIRST Robotics Competition Team 233, the Pink Team, where I worked on numerous different projects, the most notable being my contributions to the competition strategy and robot design. I don't know how yet, but I hope to guide my education in the direction that I can best contribute to the world.

I guess you could say that I am a multi-faceted individual. I don't seem to fit any stereotypes, at least never more than once. I may seem at times like my mind is only occupied with math and facts and numbers, but I can also relate to people. Every day, I try to learn how I can best understand others and their interests so that I can relate to them and gear my talents and efforts towards helping them, rather than pursuing my own gain. I am willing and able to take any seat in order to bring that about, whether it is as a humble supporter or as a pioneer and leader.



Crystal Slavens

University of South Carolina
Columbia, SC
Mechanical Engineering
Bachelor of Science 2010
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Research and Experience

- **USC College of Engineering and Computing - Teaching Assistant:** Jan 2008 - present
 - Assist in teaching two classes of thirty students ProEngineer software
 - Provide knowledge of ProEngineer to answer question and help students learn
 - Grade papers and projects in a timely fashion
- **Clover FIRST Robotics Team – Team mentor:** Aug 2006 – May 2007
 - Provide practical knowledge of electronics, pneumatics, and mechanical design
 - Chaperone trips to competitions
 - Encourage students to be leaders in the pit, on the field, and in the classroom

Membership and Activities

- **Tau Beta Pi:** 2008 – present
- **Society of Women Engineers:** 2007 – present
- **American Society of Mechanical Engineers:** 2006 – present
- **Pi Mu Epsilon:** 2008 – present
 - Integration Bee Coordinator
- **Clover FIRST Robotics Team**
 - Pit Crew Captain:
 - Safety Captain:
- **Clover Vex Robotics Team**
 - Team Mentor:

Honors and Awards

- USC Presidents List: Fall 2006, Spring 2007
- Palmetto Fellows Scholarship: 2006 – present
- USC Engineering Scholarship: 2006 – present
- USC University Scholarship: 2006- present



- Pi Mu Epsilon
- Alpha Lambda Delta

Special Skills

- Computer Languages
 - Maple
 - MathCad
- Software Tools
 - Maple
 - MathCad
 - Microsoft Office
 - ProEngineer

Hobbies

Reading sci-fi or fantasy novels, bowling, badminton, drawing, crafts, card games, listening and playing music, star gazing, collecting robotic things.

Personal Statement

I always knew that I wanted to work with science and technology. My high school started a FIRST robotics team my junior year. It was difficult getting started, but I enjoyed every minute of it. I was a member of the build team where I learned so much about pneumatics, wiring, and design. I was the pit crew captain so when something needed to be fixed I was right there fixing it. I had never worked so hard or had so much fun doing anything. After being a part of a FIRST robotics team, I knew that I wanted to be an engineer and work with robotics.

Now I am a junior mechanical engineering student at the University of South Carolina. I am going to receive my bachelors at USC and I plan to get my masters degree in either mechanical or biomedical engineering at a different university. I also help lead the freshmen engineering living and learning community. The university has upper level opportunities for me to get involved with robotics so I am excited about the next few years of my education. I would like to go to a graduate school where I can become more involved with robotics. I am also starting to look at research in robotic prosthetics. I believe that robotics can change the world and make it a better place to live. The advancements in robotics prosthetics over the last few years have been amazing. It is my dream to be able to help people with my robotic designs.

I am a strong leader but I will admit when I do not know something and I will strive to learn it. I enjoy learning and am learning new things every day. I enjoy working with other people and learning from each other. I believe that my desire to learn and my drive to get things done will lead to success in anything I put my mind to.



Return to the Moon

To support NASA's goal of returning to the moon, the team was commissioned to develop and demonstrate a beacon-based, lunar navigation system as an interim transition to autonomous lunar rover-based navigation. Creating planetary rovers is restricted by the necessity of frequent navigation command uploads. So as the number of rovers increase, this approach becomes impractical to perform. One of the fundamental requirements of autonomous navigation is to localize the rover platform. The rover will be able to compute its position relative to some coordinate system or reference landmarks. This research project also includes some physical construction, sensor development, computer programming, and actuator development. An autonomously navigated robot will be tested on a lunar terrain playing field that is equipped with navigation beacons.

Principal Investigator: *Yuri Shtessell*

Team Lead: *Josh Eliser*

Research Associates: *Luis Bill*
Jason Frisk
Amitha Mathew



Joshua Eliser

University of Alabama in Huntsville
Huntsville, AL
Computer Engineering,
Magna Cum Laude
Bachelor of Science 2008
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Research and Experience

- **UAH Research Assistant:** Aug. 2006 – present
 - Member of the Army Blackhawk Systems Integration Lab (SIL) development team
 - Developed an Embedded GPS/INS (EGI) software model to replicate the position data and the flight dynamics data supplied to the aircrafts navigation systems
 - Developed software interfaces to generate 1553, A429 and UDP data messages
 - Converted legacy software to execute on the updated SIL architecture and new helicopter configurations
 - Implemented a Linux GUI console control application to initiate and monitor the UH-60 test SIL
- **Joint Analyst Display Environment (JADE) – UAH Co-op student:** January 2005 – Aug 2006
 - Obtained a SECRET security clearance (still active)
 - Helped implement a C++ program to read in requirements, documents and automatically generate message functions and unit testing code for the message library
 - Designed and implemented an Installshield 11 script that compiled, installed and configured the JADE application
 - Assisted software users in the field by troubleshooting software installation problems
 - Worked with the FQT team to perform software quality assurance testing and verification

Membership and Activities

- **IEEE:** UAH Student branch
 - Secretary: 2007
 - Chair: 2006
 - VP of External Affairs: 2004 – 2005
- **Southeast Conference IEEE Competition** 2005- 2008



Honors and Awards

- UAH Presidential Scholarship: 2003 – 2007
- National Industrial Defense Association Scholarship: 2006, 2007
- IEEE Student Branch Student of the Year: 2006
- Alpha Lambda Delta
- Eta Kappa Nu
- Phi Kappa Phi
- Tau Beta Pi

Special Skills

- Computer Languages
 - C/C++
- Software Tools
 - MS Windows and Linux
 - MS Office

Hobbies

Fishing, triathlons, camping, canoeing, running, swimming, biking, HALO, soccer, racquetball, climbing, balloon chasing, computer modding

Personal Statement

I was born in Baton Rouge, Louisiana and attended Saint Amant for high school. My interests in robotics and electronics began at a very early age when we got our first computer. I would always play around with the system and tinker with its operation. During high school, I competed in robotic competitions and my love for computers and robotics was born.

I am attending the University of Alabama in Huntsville (UAH) and I am pursuing a Computer Engineering degree. I am a senior and have one semester left of school and will graduate in the Fall. I have been active in our IEEE student club serving as President, Vice President, and Secretary. Our club focuses on building autonomous robots to compete against other colleges in a yearly robotics competition. I have been both a team member and team leader during the years and have worked on all aspects of the projects from design, to implementation, to testing. I plan to pursue a career in robotics and will eventually get my master and PhD in either computer engineering or controls.

Apart from school and work, I love to play sports and I am an extremely competitive person. Currently I train and compete in triathlons and have recently completed the Florida 70.3 Half Ironman with plans to compete in the New Zealand Ironman. I also enjoy doing outdoor activities like fishing, camping, canoeing, and climbing. Being a computer geek, I have also lost many, many hours in front of the TV playing video games.



Luis Bill

Skyline College
San Bruno, CA
Mechanical Engineering
Bachelor of Science 2010
Email: elpot_15@hotmail.com



Research and Experience

- **MESA Tutor:** July 2007 – present
 - Provide one on one assistance to students with homework in the areas of math and physics
- **Wall Hugging Robot:** 2007 – 2008 school year
 - Robot was capable of object avoidance using photocells and IR sensors
 - Presented at Honors Research Symposium, Stanford University in April 2008.

Membership and Activities

- Society of Hispanic Professional Engineers
 - President: 2007 – 2008
- Mathematics, Engineering and Science Achievement
- Young Adults Church Choir

Honors and Awards

- MESA 2007 CSTEM Scholars

Special Skills

- Computer Languages
 - C++
- Software Tools
 - MATLAB
 - MS Windows
 - MS Office
- Bilingual
 - English/Spanish

Hobbies

Play video games, go for a walk, read, play trombone sometimes, play soccer or basketball, travel



Personal Statement

My family is originally from the Republic of Panama. We are West Indian-Afro-Latino descendants. My Father is a citizen and a veteran of the US army and I am also a citizen of the US. I am very proud of my heritage. In December 2005, I received my High School Science Diploma at the Instituto Comercial Panama. Subsequently, my first semester of college was at the Panama Technological University. In July 2006, as I began to realize my dream of being an engineer, I moved to California to live with my father and pursue a Bachelor of Science degree in Mechanical Engineering.

Being an immigrant student has not been an easy task. There are several difficulties that I have had to confront, especially the language barrier. Nevertheless, the support from my family and friends helps me to continue working hard and not lose sight of my goals.

I have had great passion for technology since I was a kid. My interest for robotics began when I was in high school. It is surely my passion. Following this dream, I started a robotics project with two of my classmates during the fall of 2007 and we presented our project at Stanford University. It has always been my dream to work building robots that could help humanity in many ways, for example, robots that can work in areas that are relatively dangerous for human beings (including planetary exploration as the main goal), and ironically, I got my first internship with NASA to work on a lunar rover project.

My internship with NASA will increase my knowledge in the field and will offer me an opportunity to develop my academic attitudes. This unique experience will give an opportunity to work with real experts from such an organization. Moreover, working on an internship will allow to learn how to use what I have learned at college and how to apply it on the field and in different real life situations. The opportunity will bring me a chance to know to develop myself as a mechanical engineer.

Among the experience and the development a person can achieve in an internship, the cultural interaction with students from different colleges is going to be an important and unforgettable part of my life. This experience will help to build relationships and networks with the future scientists of the US and of the entire world. I am very thankful with NASA for giving my fellow interns and me this opportunity to open many doors for our future.



Jason Frisk

Pennsylvania State University
Erie, PA
Computer Engineering
Bachelor of Science 2009
Email: jrf5034@psu.edu



Research and Experience

- Design and construction of a line following robot.
- Worked on a PID control system for a multi-processor autonomous robot.

Membership and Activities

- **Penn State Behrend Robotics Club:** 2007 - present
 - *President: 2007 – present*
 - Restarted club after a period of inactivity
- IEEE: 2007 – present

Honors and Awards

- Deans List: 2005, 2006
- Scholarship for most Creative Thinker

Special Skills

- Computer Languages
 - C/C++
 - Java
 - Magic, IRSIM
 - MATLAB
 - MIPS Assembly
 - PSPICE, PCSPIM
 - VHDL, Xilinx, ModelSim
- Software Tools
 - MS Windows and Linux
 - MS Office
- Electronics
 - Oscilloscopes



Hobbies

Karate, piano, and SCUBA diving

Personal Statement

I was born in Ellwood City Pennsylvania in 1986, and have lived there my entire life. After graduating from Lincoln High School in 2005, I attended Penn State Behrend. I am currently a senior at Penn State Behrend majoring in Computer Engineering and Electrical Engineering. To further my knowledge of robotics, I became a member of the Penn State Behrend Robotics Club in 2005. In 2007, I became the President of the Penn State Behrend Robotics Club, and we are currently designing and building a fire-fighting robot. After graduation, I hope to go to graduate school for robotics.

Besides robotics, I enjoy practicing karate, and playing the piano. I have been doing both since the age of seven and I find them to be very rewarded activities. Also, I recently got into SCUBA diving after receiving my certification in 2007. My desire to learn new things lead me to robotics since this field encompasses many disciplines. I ultimately want to work on autonomous robots, and I hope one day my work will make the world a better place.



Amitha Mathew

University of Texas
Dallas, TX
Electrical Engineering
Bachelor of Science 2009
Email: ami_mathew@yahoo.com



Research and Experience

- **University of Texas at Dallas** – Math/EE Tutor: Oct. 2005 – present
 - Tutor all freshmen and sophomores who need help with math problems
 - Collect previous question papers of all undergraduate EE courses to provide a thorough idea about the up-coming tests
 - Explain each section of text by illustrating examples and sketching graphs

Membership and Activities

- IEEE
- SWE
- IPP
- Malayalee Engineers Association of North Texas
- Indian Student Association

Honors and Awards

- Deans List
- Academic Bridge Program
- TWD-TETC

Special Skills

- Computer Languages
 - Visual Basic
 - C/C++
 - Java
 - MATLAB



- Software Tools
 - JCreator LE 4.50
 - JDeveloper 10
 - LabVIEW
 - MATLAB
 - MS Office
 - OrCAD 10.0
 - Xilinx ISE 8.2i
- Electronics
 - Function generators
 - Oscilloscopes
 - Power supplies
 - Source meters

Hobbies

Reading, watching TV, listening to music, talking on the phone, and cycling.

Personal Statement

My name is Amitha Mathew and I am an Electrical Engineering major at University of Texas at Dallas. Since I am considered senior, I was interested in improving my technical knowledge by doing a summer internship in my field. It has always been my dream to participate in the NASA Robotics Academy program, and today I have accomplished that dream.

I have achieved success through hard work and commitment towards my studies; however, I would like to share some of the achievements and extracurricular activities of my life. Even though I came to United States after completing my ninth grade from India, I was able to graduate in top eight percent from Mesquite High School, Texas in 2005. Being a part of Academic Bridge Program (ABP), I was able to start my college life in summer 2005 by taking core level courses prior to freshmen year. The Engineering Department was very pleased by my superior performance during the fall 2007 semester. In recognition of this achievement, my name has been placed on the Dean's list among the top ten percent of all students in the School of Engineering and Computer Science (ECS). Now being a fast track student at UTD, I am also planning to take two graduate level courses in my undergraduate degree plan.

I am very thankful to this summer program for giving me such a wonderful opportunity to work on the NASA project. I believe that this will be an extraordinary summer and I will treasure all the knowledge I gain from this program.



Staff

NASA Robotics Academy Program Director

Dr. Alan S. Chow

Dr. Chow was an aerospace technologist at NASA's Marshall Space Flight Center in Huntsville, Ala. He is a 2001 recipient of a NASA Administrator's Fellowship, an annual award intended to enhance academic partnerships with NASA by sending top researchers to study and teach at minority-serving institutions. He is an Associate Fellow of AIAA. Dr. Chow earned his BS (1967), MS (1971), and PhD (1991) in Aerospace Engineering at the University of Alabama at Tuscaloosa.

Program Manager

Dr. Gerald R. Karr

Dr. Karr is a Professor of Mechanical and Aerospace Engineering at UAH. Since 1992, Dr. Karr has also served as the UAH Campus Director of the ASGC. Dr. Karr also served as the Chair of the Mechanical and Aerospace Engineering Department at UAH from 1986 through 1999. Dr. Karr has, since 1978, been the University Director of the highly successful NASA Summer Faculty Research Opportunity (NSFRO) program. Dr. Karr has also been an active researcher in the areas of satellite drag, high-energy lasers, cryogenics, spacecraft thermal design and computational fluid mechanics. Dr. Karr earned his BS (1964), MS (1966), and PhD (1969) in Aeronautical and Astronautical Engineering at the University of Illinois at Champaign-Urbana. For recreation, Dr. Karr enjoys golf, running, sailing and visiting with his children and grandsons.

Operations Manager

Kyle Unfus

Kyle is an alumnus of the 2007 NASA Robotics Academy at MSFC. He graduated in September 2006 from Worcester Polytechnic Institute with a Bachelor of Science in Aerospace Engineering. He is currently working to finish his thesis to complete his MS in Mechanical Engineering also from WPI. Kyle's focus is currently on numerical modeling of fluid-thermal systems particularly catalytic thrusters and nozzles. He plans to find full time employment in the fall at a location where he can pursue his goals of further education in this area. Eventually Kyle plans to earn a PhD, become an astronaut, found his own propulsion company and teach at the collegiate level.



Outside of education, Kyle enjoys being outside and actively enjoys swimming, biking, rock climbing, camping, sailing, sky-diving and other extreme sports. In addition to being outside, Kyle takes pleasure in cooking, home-brewing watching movies and spending time with friends and family.



Links

- ***NASA Robotics Academy:***
<http://university.gsfc.nasa.gov/programs/robotics.jsp>
- ***NASA Robotics Alliance Project***
<http://robotics.nasa.gov/>
- ***NASA Robotics Academy Alumni Association***
<http://www.roboticsalumni.org/>
- ***NASA Academy Alumni Association:***
<http://www.nasa-academy.org/>
- ***NASA Agency:***
<http://www.nasa.gov>
- ***NASA Marshall Space Flight Center:***
<http://www.msfc.nasa.gov/>
- ***Botball Robot Competition:***
<http://www.botball.org/>
- ***For Inspiration and Recognition in Science and Technology:***
<http://www.usfirst.org/>
- ***International Space University:***
<http://www.isunet.edu>
- ***The Soffen Memorial Fund:***
<http://www.nasa-academy.org/soffen/donors.html>