



Mechanical Engineering

Department Newsletter

University of New Hampshire, Durham, NH

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Volume III, Issue I

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Nuts and Bolts Fundraising:

Please consider giving a tax
deductible donation to the
ME General Fund.

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homepage at <https://giving.unh.edu/cepsme> and select
the Donate tab located on
the far right menu bar to
select an ME fund.

THANK YOU!

A Word From the Chair

The academic year is going by quickly as always. Our senior design teams are busy finalizing their projects for competitions, presenting results to industrial partners, and collecting research data. We are proud of their accomplishments and look forward to the UNH Undergraduate Research Conference Interdisciplinary Science and Engineering event at the Whittemore Center on Wednesday, April 20th, 2 – 5 pm, where they and others will be presenting their projects. If you can attend, please do. This is a wonderful celebration of their hard work!

A few issues ago, I asked, "Who was the first female student to graduate from the ME program?" What we came up with for an answer is: **Sharon Smith, BSME, 1967**. If you can verify, amend, or provide contact information for Ms. Smith, please send us a message. We would greatly appreciate this. Again, the goal is to honor this pioneer in some way. If you have any suggestions for how to honor her, please let us know.

Several of you provided alumni updates for this issue which we in the department and your former classmates really enjoy reading! Please keep submitting these and thank you for staying engaged with our department! Happy Spring!

Brad Kinsey
Professor and Chair, Mechanical Engineering Department

Awards & News

- Paige Balcom (ME Senior) is one of the 10 students university wide, who will be featured in the UNH Create Your Own Story competition. Her story will be unveiled on Friday, April 15th.
- Milan Ardeljan and Milovan Zecevic (Grad Students, advisor Prof. Marko Knezevic) have been selected to receive a Dissertation Fellowships for the 2016-2017 academic year.
- Prof. Yaning Li received a National Science Foundation CAREER Award, entitled "Mechanics of Bio-Inspired CNT-Modified Hierarchical/Fractal Interfaces".
- Christopher Hashem, Thomas Fuller, and Michael Johnson (Grad Students, advisor Prof. May-Win Thein pictured right) presented their papers at the Space Flight Mechanics Symposium in Napa, California.
- The Aerocats team left for their competition in Fort Worth, Texas on March 9th.



- Prof. Korkolis (left) was invited at the end of January by the Iron and Steel Institute of Japan and by the Japan Society for the Technology of Plasticity to participate in the International Seminar on Advanced Material Processing and Material Modeling for Steel, hosted by the Tokyo University of Agriculture and Technology.

FACULTY & GRADUATE SPOTLIGHT

Controlling Robots in the Ocean and in Space

Associate Professor May-Win Thein's research is in the area of System Dynamics and Control, specifically to use control methods for robotic space and marine vehicles.

Professor Thein's work enables robotic space exploration through her research in autonomous extraterrestrial surface navigation via Celestial Navigation and in the optimal search/exploration/mining of these extraterrestrial surfaces using Particle Swarm Optimization. She also develops control methods for satellites/spacecraft and autonomous aerial vehicles.

Professor Thein also works on unmanned marine vehicles, such as Autonomous Surface Vehicles (ASVs) and underwater Remotely Operated Vehicles (ROVs). Such vessels enable autonomous sea floor mapping; search and rescue missions; and operations involving mobile ocean structures.



Professor Thein

Background Images:

Lunabots

QuadSat

ET NavSwarm

Autonomous Surface Vehicle (ASV)

Remotely Operated Vehicle (ROV)

She is specifically controlling multiple vehicles to collaboratively perform tasks more safely and efficiently than any single ASV or ROV. She is also developing optical-based sensors for cost-effective and precise distance and heading detection of Unmanned Underwater Vehicles.

In support of her research, Professor Thein is the faculty advisor for the Lunabot, QuadSat, ET NavSwarm, ASV, ROV, and the DIY Engineering Teams. In addition, she has served as a guest lecturer/researcher at the NASA Goddard Space Flight Center, the Naval Underwater Warfare Center at Keyport NAVSEA, the University of Sheffield (UK), the University of Leicester (UK), and the Polytechnic University of Catalonia (Barcelona, Spain). She was also named a United Kingdom Royal Society Fellow in 2007 for her international collaborative work on spacecraft control.

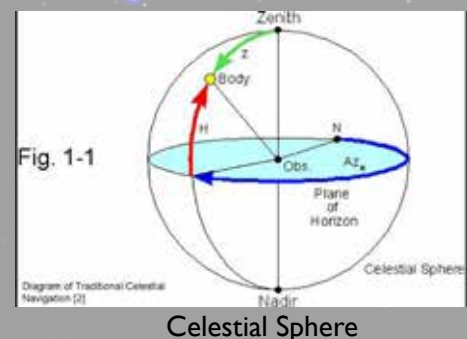
Navigation on Extraterrestrial Surfaces with Thomas Fuller



Background Image:
"Image 60" actual photo
used for navigation
Photograph by
Thomas Fuller

I work with Prof. Thein in the Advanced Controls Lab. My Master's Thesis focuses on celestial navigation on extraterrestrial surfaces. In our lab, we are using images of the stars and a computer vision based method to determine the position on the surface of other planets. My method combines the Nautical Sight Reduction method used by sailors to determine latitude and longitude since the pre-GPS era, combined with an image processing suite called "Blind Astrometric Calibration of Arbitrary Astronomical Images." It can be accurate up to approximately 5 nautical miles in its current form. I was fortunate enough to present this project at NASA Goddard

Spaceflight Center last summer. My short term career goal is to earn my PhD studying a problem related to space science or space systems. My long term goal is to become a professor in engineering, doing research that will help make every day spaceflight a reality. For now, most students know me as their TA in various courses. In my spare time I try to prepare healthy meals, sleep eight hours a night, go to the gym, and play video games. My name is Thomas Fuller and I'm proud to be a wildcat.



UNDERGRADUATE SPOTLIGHT

Always on the Move



Alexander Larson is a junior in the Mechanical Engineering Program. He is also pursuing an applied mathematics minor and plans to focus on his studies in topics that can be applied to the aerospace field. After graduation, Alex says he will most likely pursue a MS in engineering although he is unsure of what specialization.

Last summer, Alex had an internship with ComEd Energy, an Exelon Company, in their relay and protection department. Alex was tasked with laying the foundations to re-engineer ComEd's distribution lines that were operating on leased-line or audio-tone teleprotection circuits. This summer, Alex has an internship with Pratt & Whitney in Berwick, ME.

At school, Alex is quite active in the Mechanical Engineering Department

helping with tours for potential students, admitted students' day, and tutoring. Alex is the vice-president of the UNH chapter of the American Society of Mechanical Engineers. He is also a member of Tau Beta Pi and Pi Mu Epsilon. In 2016 he hopes to start a UNH chapter of Pi Tau Sigma, the international mechanical engineering honor society. Last semester, Alex worked with Professor Yaning Li investigating structures that have a negative Poisson's ratio, specifically those that operate through unit-cell rotation. When he has time, he also helps with a senior project examining turbine and wingtip analysis and design. Outside of school, Alex loves cross country and downhill skiing, hiking, biking, and rock climbing. Even with all of these activities, Alex has maintained a high GPA.

SENIOR PROJECT SPOTLIGHT

Mining the Celestial Plains (LUNACATS)

The 2016 LunaCats is an interdisciplinary group of 10 Mechanical Engineering, Electrical Engineering, and Computer Engineering majors. The team of graduate and undergraduate students are devoted to the design and construction of a robotic excavator. They are very involved in the local community by hosting groups of local students for engineering activities, participating in technology events on and off campus, and volunteering for FIRST robotics events.

As a 6th year veteran team, the LunaCats have a rich history with the NASA Robotics Mining Competition. LunaCat's history includes:

- 3rd place in mining in 2013-14 year while being the smallest team and school in the top 10.
- Two Efficient Use of Communications Power Awards.

- Social Media Award.
- 5th place overall in 2014-15.
- Finished in the top 10 out of 50 schools for the past 5 years.
- Consistently being the first teams to pass inspection and communication tests.
- Known for building small, efficient, and effective robots.

Looking to build on past success, this year's team is aiming for a fully autonomous entry.



UNH LunaCats demonstrating the Mining Robot at the First Lego League Competition hosted at UNH in November 2015.

ALUMNI/COMPANY SPOTLIGHT



Richard Oedel
B.S.M.E. 1976, M.S.M.E. (Control Systems) 1977

After completing his Masters degree under Charlie Taft, (Professor Emeritus of ME,) in the fall of 1977, Richard Oedel moved to the Midwest working for Warner Electric in their R&D and automotive groups, specializing in brakes, clutches, stepping motors and controls. In the early 80's, moving back to New England, Richard joined the family business creating customized plastics products for the foodservice and hospitality industries. For the next 18 years, he expanded the business to several hundred employees. When he sold in 1999, Richard went back to the North Bennet Street School (NBSS) in Boston, learning to make one-of-a-kind handmade furniture. Richard said about his career change, "You know those little drink stirrers you see at McDonald's? We made billions of those," he adds, "Injection-molded plastics. Countless things with low intrinsic value. Now I'm at the other end of it. I make one piece at a time." While this may sound like a disconnect from the engineering field, there have always been threads that tie it together. Hands-on

experience in machine shops as a college student, a deep passion for historic preservation, and a knowledge of how to use technology as a tool all helped to create skillsets that were ahead of the curve. At a time when the average manufacturer was designing customized molds with models made of wood, his company purchased CNC equipment and merged it with video equipment to scan clients' artwork and cut new molds directly from the digital images. Richard uses similar techniques in the process of creating and executing his furniture designs. Richard has been a member of the ME Industrial Advisory Board for over 10 years and has lectured at Harvard Business School, MIT Sloan School, UNH, NBSS and Winterthur, as well as serving as a mentor and teacher for aspiring furniture makers. As past chairman of the New Hampshire Furniture Masters and co-chair of the national Furniture Society conference at MIT in 2010, he is active in designing, teaching, and promoting furniture making. He lives in Boston with Marie Clough Oedel, '76, a nationally recognized book conservator. Their son, Bill Oedel ('13 Chem E) is a jet pilot in the Marine Corps. Richard makes furniture in his shop, Fort Point Cabinetmakers, in South Boston. His pieces are found in private collections and museums around the country, including the Metropolitan Museum in NY and the Museum of Fine Arts in Boston.

Background Image:
Inlay design from the table
pictured to the right.



WILDCAT TALES

Drew Garvey, B.S.M.E. 2013

Drew was promoted from Project Engineer to Senior Product Development Engineer in the Innovation Services Group of J-pac Medical, located nearby in Somersworth, NH.

Alex Washakowski, B.S.M.E. 2012

Alex lives in Stonington, CT and has been working at General Dynamics Electric Boat since July of 2012. Until early February 2016, she worked in ventilation for the OHIO Replacement program in the New London, CT engineering office. She is now working as an operations supervisor for the outside machine shop in the Groton, CT shipyard; working on the VIRGINIA Class program. She will be graduating with a Master's degree in mechanical engineering from RPI in May 2016. Alex and her boyfriend, Chris, (pictured right, outside of London) recently took a two week trip to Europe and the UK.



Chris Suprock, Ph.D. 2011

Chris's company, Suprock Technologies, LLC, released a new telemetry product for large turbine generators. [Check out the article link in Power.](#)



Mike Poreba and Adam Fitzpatrick, B.S.M.E. 2008

Mike and Adam hiked up and stayed overnight in the Mt. Washington Observatory last month. They asked the scientists a thousand questions and woke up to crystal-clear views.

Michael Conti, B.S.M.E. 2004

Michael and Eric Ely (Computer Science alum '06) founded GoGlove. [Check out the full length article on the ME website.](#)



Chris Chadbourne, B.S.M.E. 1991

Chris was promoted to Vice President, Operations for BURNDY LLC in Manchester NH. Chris' responsibilities include leading the Manufacturing, Supply Chain, and Quality functions for BURNDY inclusive of three New England manufacturing locations as well as support of operations in Mexico and Brazil. Headquartered in Manchester, BURNDY is the premier manufacturer of electrical connectors and application tooling serving the electric power industry. Prior to this role, Chris served as Vice President of the Engineering, Product Management, and Business Development functions for the Utility sector of BURNDY's portfolio.

Marti Nyman, B.S.M.E. 1983

Since graduating in December 1983, Marti has held a variety of roles working at firms such as – GE, ADC, Ericsson, Best Buy and now at UnitedHealth Group, where he is the Vice President of Business Development and Commercialization. He said, "While I don't get to do any "real" engineering in my role, working with the complexities and challenges of the healthcare industry is a great opportunity to apply all that I've learned, both at UNH as well as in my career." Marti currently resides in Chanhassen, MN and is blessed with three (grown) children and a wonderful wife, Carolyn. Pictured right is Marti and Carolyn on their Harley Davidson touring bike that they enjoy ("at least during the months when it's not snowing or -23 degrees").



WILDCAT TALES

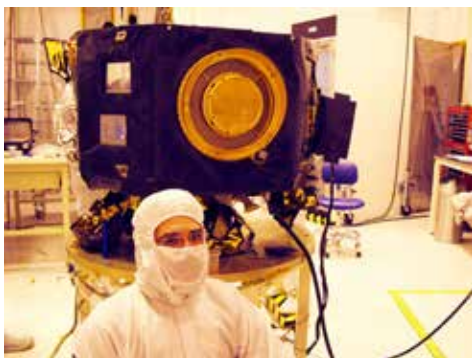
Michael Hunter, B.S.M.E. 1983

Michael designed, tested, and produced machinery for many years. He now owns H6 Systems Inc. where he designs high power transmitters for the US Army and Navy. He has a patent on an automated O-ring inserter and has published his first novel, *Earth Unraveled*, under the name Rath Dalton. He and his wife, Karen, met at UNH and live with their two sons in Bedford, New Hampshire.

Mark Granoff, B.S.M.E. 1982

After a very successful 25 year career at the UNH Space Science Center as a Senior Research Project Engineer, Mark has left UNH to accept the position of Engineering Manager at Ferrotec in Bedford, NH.

This exciting new leadership role will be a fresh start, but Mark will always be proud of the 7 NASA and ESA (European Space Agency) missions he participated in, and the 42 flight instruments he helped build that are flying high above EARTH. Most recently was the highly successful NASA MMS mission with the challenging SDP instrument set of 16 identical wire boom deployers which achieved a 100% deployment success rate! These instruments will allow mission scientists to fully study magnetic reconnection in the Earth's magnetosphere, hopefully unlocking the keys to nuclear fusion. The unique deployment mechanism in SDP earned Mark an invitation to the 42nd Aerospace Mechanism Symposium as a Proceedings Author and Presenter. During his long "tenure" at UNH, Mark had the privilege to



work with not only an unparalleled team of engineers, technicians & scientists, but also mentored many UNH ME students that have gone on to wonderful careers at companies such as BAE, Orbital Sciences, Raytheon, Teledyne, Ametek, NASA Goddard, and the US Air Force! Mark is proud to have played a role in the development of so many bright young engineers from UNH!

These include Caleigh MacPherson (under MMS earned both BSME and MSME), Garrett Roy (under MMS earned both BSME and MSME), David Jonas Rob Lamontagne (Major US Air Force and B2 bomber pilot), Brenden Monhan, Jeff Beaudoin, Rick Miller (BAE Engineering supervisor), Jon Villeneuve, and Matt Camillieri (my first student assistant, Owner and Operator of Stone Machine in Derry, NH which supported all our programs). Although moving on, Mark

will keep in touch with his many colleagues at UNH and several of the students he worked closely with over the years. To see some of Mark's handiwork first hand, you can go to the McAuliffe-Shepard Discovery Center in Concord, NH and view the UNH CATSAT Satellite exhibit hanging from the atrium ceiling. Mark mentored ME students during the development of CATSAT and he designed the aluminum honeycomb satellite bus structure and the Payload Adapter Fitting (PAF), i.e the large aluminum cone mounted at the base of CATSAT adapting it to the Boeing Delta rocket. A second copy of the PAF is the only part of CATSAT that ever flew when NASA called it in for use on the CHipSAT mission. Go to the McAuliffe-Shepard Discovery Center to learn more about the story of [CATSAT](#) and see how this program helped develop so many engineering careers!

Martha Nevin Cyr, B.S.M.E. 1982

Martha was elected a fellow of the American Society of Engineering Education. Check out the link from [Worcester Polytechnic Institute](#).

Roger Saunders, B.S.M.E. 1954

Roger installed a PV array at their home that is large enough to produce all of the electric power their home requires, on an annual basis. They connect to the grid through a Net Meter that allows them to "store" surplus energy on bright sunny days and draw on that stored energy when the sun isn't meeting their needs. They turned the system on in June 2014, and it has been working perfectly since.

Nuts & Bolts Fundraising

Please consider giving a tax deductible donation to the M.E. General Fund, which will support all senior design projects, or to one of two identified funds, UNH Precision Racing and Lunabotics Teams. This will provide the teams the resources necessary to be successful without having to focus extensively on fundraising.

To donate, visit the CEPS homepage, and select the Donate tab located on the far right menu bar. From there you can select one of the three Mechanical Engineering funds (or others of interest, e.g., Engineers Without Borders, Society of Women Engineers, etc.).

Please help support our students and the Mechanical Engineering program for the future and beyond. Please contact [Mike McCarthy](#) for more information.



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CONNECTED

We would like to stay connected with our alumni and friends and would welcome your newsletter contributions and suggestions.

Please send your news items, e.g. awards, promotions, personal updates, memories of UNH, and suggestions to Lauren Foxall at lauren.foxall@unh.edu

Newsletter Coordinators: Lauren Foxall (designer/creator/editor), Tracey Harvey (editor/public relations), and Barbaros Celikkol (Chief)

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