College of Engineering Fall/Winter 2009 – 2010

UNIVERSITY OF MICHIGAN

Naval Architecture and Marine Engineering

NAUTILUS

Fall/Winter 2009—2010

Volume 32

The Newsletter of The Department of Naval Architecture and Marine Engineering

Inside this issue:

NA&ME Dedicates American Bureau of Shipping Design-Build-Test Marine Systems Laboratory

Through the generous sponsorship of the American Bureau of Shipping, the Office of Naval Research, John Couch, and Bruce Rosenblatt, the College of Engineering (CoE) and NA&ME were able to outfit and staff a laboratory whose primary purpose is to support the College's first year marine design-build-test sections of ENG100 – Introduction to Engineering . The official laboratory dedication of the "ABS Laboratory for Naval Architecture and Marine Engineering" took place on November 6, 2009 where presentations were made by ENG100 students and instructors, College administrators, and special guest, Todd Grove, American Bureau of Shipping President and COO, Europe Division. The dedication was attended by students, faculty, staff, the NA&ME Advisory Board, and invited guests.

Todd Grove, ABS President and COO, Europe Division, dedicates ABS Design-Build-Test Laboratory

This version of ENG100 is a hands-on systems approach to marine engineering developed in 2007 by Research Scientist Deano Smith (NA&ME) and Professor Pete Washabaugh (AERO). It is modeled after Pete's very successful Blimp Design-Build-Test course. The current NA&ME instructors are Lecturer Dr. Laura Alford and Dr. Julie Young.

The course introduces students from all disciplines to practical marine-system engineering processes through the design, building, testing and operation of simple underwater exploration vehicles. It is of interest to those considering careers in ship and yacht design, as well as all who are fascinated by explorations of the undersea world through both manned and unmanned submersibles. The instructors analyze recent footage of the Titanic, discuss science operations by Jason Roy, and consider the use of an Autonomous Underwater Vehicle (AUV) to explore the oceans of Jupiter's ice-covered moon Europa, all in the context of learning engineering design practices for marine systems and vehicles.

Students working on team projects in Eng 100

For hands-on experience, students design and build a near-neutrally buoyant aquatic observing station and a remotely-operated underwater vehicle (ROV). They are exposed to multiple disciplines in both engineering and the sciences including Marine, Aerospace, Electrical, Mechanical, and Materials Engineering, Physical Oceanography, and Physics of Fluids. The class involves experiences covering nearly all aspects of a real mission including concept proposal, design fabrication, test, operations, analysis, documentation, and presentation of results. There is individual training on fundamental diagnostic instruments, sensors, and computer tools. Specific experiments

(Continued on page 3)

A Word from the Chair

Armin Troesch

This edition of the *Nautilus* brings to you news of new faculty, summer intern experiences, student-faculty research, and special interest stories.

The department has been fortunate to add two outstanding young professors to its faculty. Assistant Professor Matthew Collette, a graduate of the University of Newcastle and previous senior naval architect at SAIC, will be responsible for teaching the senior final design and graduate design-optimization courses. Associate Professor Yin Lu (Julie) Young, who comes to us from Princeton University, has a varied background in multiphase flow, hydroelasticity, and propeller design. Both Julie and Matt have already started their research groups and we look forward to hearing about their exciting new efforts.

The *Nautilus'* feature article describes the dedication of the American Bureau of Shipping's Design-Build-Test Marine Systems Laboratory. Through the generous support of ABS, the Office of Naval Research, John Couch, and Bruce Rosenblatt, the Department and College of Engineering were able to renovate and outfit a state-of-the-art classroom for first year engineering students. Here students are able to use laboratory equipment not usually available to undergraduates to design, build, and test complex marine systems. In four years, these young engineers will become part of a graduating UM cohort containing future leaders of academic research and professional practice.

The NA&ME faculty and students continue to conduct leading-edge research for engineering in the marine environment. Four examples are reported here on areas as diverse as autonomous underwater hull inspection, deep water breaking waves, impact loading on plates, and planing hull dynamics. Many more examples may be found on the department's web page at http://name.engin.umich.edu/research_proj. You are encouraged to visit the site and look over the many and varied interdisciplinary projects.

While the country and world still face serious economic challenges, our students continue to benefit from your generosity and mentoring. We currently have over 110 undergraduates and 70 graduate students enrolled in the NA&ME program. Your loyal support has allowed our students to attend the SNAME annual meeting, national and international conferences, and summer internships. This past year NA&ME interns traveled to Korea, Denmark, and China. Even though students have to work harder than in previous years in securing job interviews, our graduates are still able to find exciting and meaningful post-graduation employment opportunities.

Degress received Winter/Spring/ Summer 2009

Graduates—BSE

Jonathan Abel-Millman
Christopher Adams
Karl Anacker
Mark Ausborn
Erin Bachynski
Peter Bartlett
James Bradford
Livia Cohen
Adam Cove
Daniel Dabrowski
Charles Dorger III
Amanda Dye
Jacob Faust
Grzegorz Filip
Stephen Glynn
Jason Goldis
Evan Kaplan
Lauren Kemink
Matthew Kramer
Nathan Leightner
Bruce Martin
Jeffrey Matson
Thomas McKenney
Catherine O'Brien
Alexander Ogdon
Morgan Parker
Adriana Partida-Rodriguez
Dominic Piro
Michael Policastro
Christopher Rose
Kazuya Sasahara
Edward Schehr
Conor Shannon
Helena Van Gilder

Graduates—MSE

Todd DeVries
Deborah Edmund
Christopher Hart
Stephen Minnich
Mark Neeland
Nathan Neise
Matthew Weber

Graduates—MS

Jesse Parkhurst

Graduates—PhD

Sina Aragh
Piotr Bandyk
James Bretl
Athanasis Denisis
Zhen Li
WeiWei Yu

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Kathy Brotchner, Compositor
Suzanne Taylor, Editor
Armin W. Troesch, Editor

(Continued from page 1)

include multi-meters, power supplies, temperature and pressure sensors, thermal-vacuum testing, endurance and survivability testing, data acquisition, and remotely controlled components.

Prof. Roger Compton, Dean of Webb Institute, and former Secretary of the Navy, Dr. Donald Winter, share stories at the ABS Laboratory Dedication

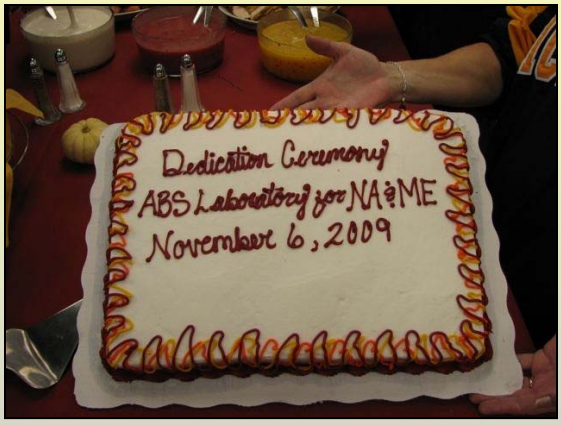
This Design-Build-Test section of ENG100 emphasizes development of individual practical skills, oral and written communication and working effectively in a team environment. The students have been warned that this is an intensive class involving a laboratory with a minimum of 6 contact hours per week. Yet the course is over subscribed and has one of the highest student satisfaction ratings of all the ENG100 sections.

There are typically events or "competitions" where students display their marine vehicles. This year the competition was held in the University of Michigan Natatorium.

Dedication plaque

The class took advantage of the generous offer by UM Swim Coach, Mike Bottom, to drive their ROVs in the simulated Europa ocean (the Natatorium's large diving well) trying to identify Jovian sea creatures.

The impressive video capabilities of the facility coupled with several of the department's Marine Hydrodynamics Laboratory commercial ROV's allowed students and professors to follow along by watching the several televisions on deck or by glancing at the video board on the wall. It was a fitting course ending to a great first-year laboratory experience.



Celebratory cake

Dr. Laura Alford (center) , Dr. Julie Young (far right) and students

New Faculty

Yin Lu (Julie) Young, Assoc. Professor

Prof. Yin Lu (Julie) Young joined the Department of Naval Architecture and Marine Engineering at the University of Michigan as an Associate Professor in Sept of 2009. Prior to joining Michigan, she was an Assistant Professor in the Department of Civil and Environmental Engineering at Princeton University. Prof. Young received her Ph.D. from the University of Texas at Austin in 2002. She is the recipient of the ONR Young Investigator Award and the Princeton University Rheinstein SEAS Junior Faculty Award in 2005. She also received the UPS Visiting Professorship from Stanford University in 2008, and was appointed as a Senior ONR-ASEE Faculty Fellow at Naval Surface Warfare Center, Carderock Division in 2009. Prof. Young's research interests and expertise are in the area of numerical and physical modeling of multiphase flow and composite structures including: energy-efficient propulsors and turbines, blast-resistant composite marine structures, smart wind and ocean energy conservation technologies, wave soil-structure interactions, and smart biomedical devices. Prof. Young has written over 90 journal and conference papers in the area of fluid-structure interaction related to ocean and coastal engineering systems.

Matthew D. Collette, Assistant Professor

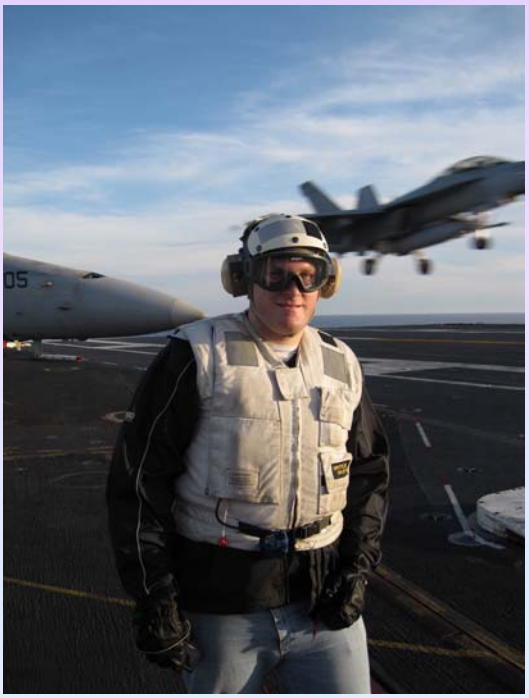
Dr. Collette joined the University of Michigan in the fall of 2009 as an assistant professor in the Naval Architecture and Marine Engineering Department. His research focuses on the application of numerical methods to design and operational support, with a focus on structural response and stochastic methods. Before joining the University of Michigan, Dr. Collette worked as a senior naval architect at SAIC, supporting a wide variety of structural and hydrodynamic research programs. These programs included acting as the principal investigator of a three-year project researching ultimate limit state and fatigue design of aluminum structure. Dr. Collette has also been the principal investigator on the one-year Ship Structure Committee project SR-1457 investigating optimization of aluminum extrusions. Other work included design optimization and working with an industry team on the development of a multi-stage hydrodynamic optimization procedure for high-speed sealift vessels and using high-performance computing resources for vessel voyage planning considering local forecast weather conditions. Dr. Collette received his PhD from the University of Newcastle in the United Kingdom in July of 2005, where his research focused on aluminum structures and risk based design. Before that, he worked as a naval architect at John W. Gilbert Associates, Inc. in Boston. Dr. Collette is a registered Professional Engineer in the state of Maryland. He is teaching NA 475 and NA 570 in the winter term.

USS Stennis Aircraft Carrier

by Doug Rigterink

Dr. Singer and I spent 24 hours on the USS John C. Stennis about 100 miles off the Coast of Mexico. We spent the time touring the ship, watching flight operations, meeting the crew, and learning about how a floating city operates. Hands down the best experience was getting to be catapulted off the ship for our flight back.

Assistant Research Scientist David Singer



4th year student Doug Rigterink

The background pictures on pages 10, 12, 14, 17 and 22 were taken on the USS Stennis Aircraft Carrier

Research

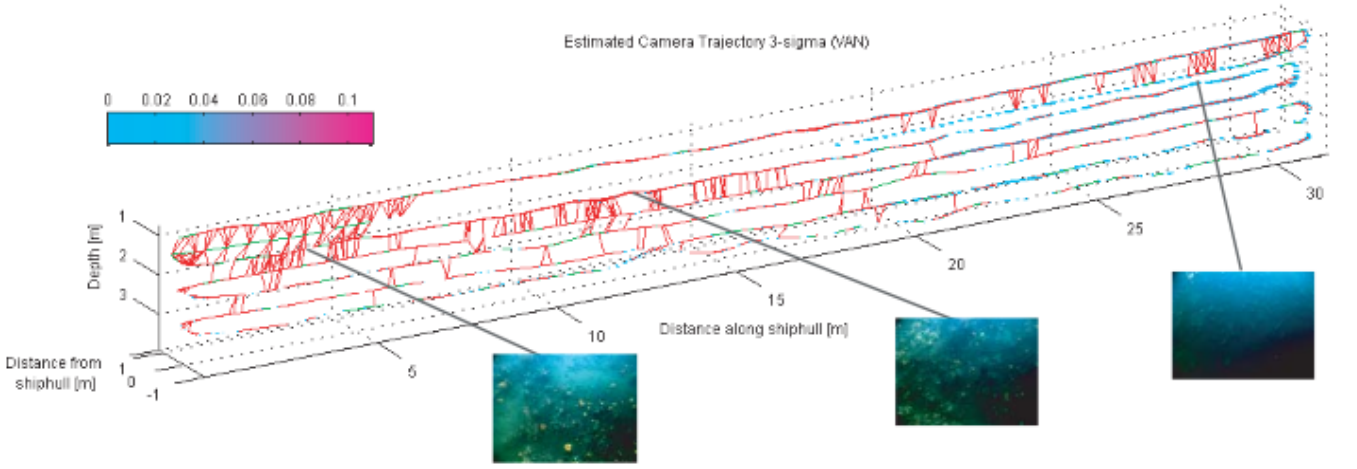
The following abstract describes a refereed paper presented by Prof Ryan Eustice and doctoral student Ayoung Kim at IROS 2009: The 2009 IEEE/RSJ International Conference on Intelligent Robots & Systems. The paper will be published in the conference proceedings.

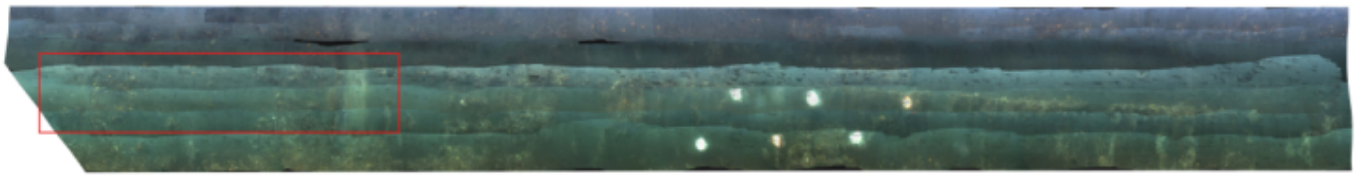
Pose-graph visual SLAM with geometric model selection for autonomous underwater ship hull inspection

Ayoung Kim and Ryan Eustice

Ayoung Kim

This paper reports the application of vision based simultaneous localization and mapping (SLAM) to the problem of autonomous ship hull inspection by an underwater vehicle. The goal of this work is to automatically map and navigate the underwater surface area of a ship hull for foreign object detection and maintenance inspection tasks. For this purpose we employ a pose-graph SLAM algorithm using an extended information filter for inference. For perception, we use a calibrated monocular camera system mounted on a tilt actuator so that the camera approximately maintains a nadir view to the hull. A combination of SIFT and Harris features detectors are used within a pairwise image registration framework to provide camera-derived relative-pose constraints (modulo scale). Because the ship hull surface can vary from being locally planar to highly three-dimensional (e.g., screws, rudder), we employ a geometric model selection framework to appropriately choose either an essential matrix or homography registration model during image registration. This allows the image registration engine to exploit geometry information at the early stages of estimation, which results in better navigation and structure reconstruction via more accurate and robust camera-constraints. Preliminary results are reported for mapping a 1,300 image data set covering a 30m by 5m section of the hull of a USS aircraft carrier. The post-processed result validates the algorithm's potential to provide in-situ navigation in the underwater environment for trajectory control, while generating a texture-mapped 3D model of the ship hull as a byproduct for inspection.





Prof Armin Troesch and doctoral students Nabanita Datta and Oscar Tascon presented papers at the FAST Conference. Started in Trondheim, Norway, in 1991, FAST conferences take place every two years and are the world's leading conferences addressing fast sea transportation issues. FAST 2009, the 10th International Conference on Fast Sea Transportation, was held in Athens, Greece, from October 5 to 8, 2009. Following are the Abstracts from their papers.

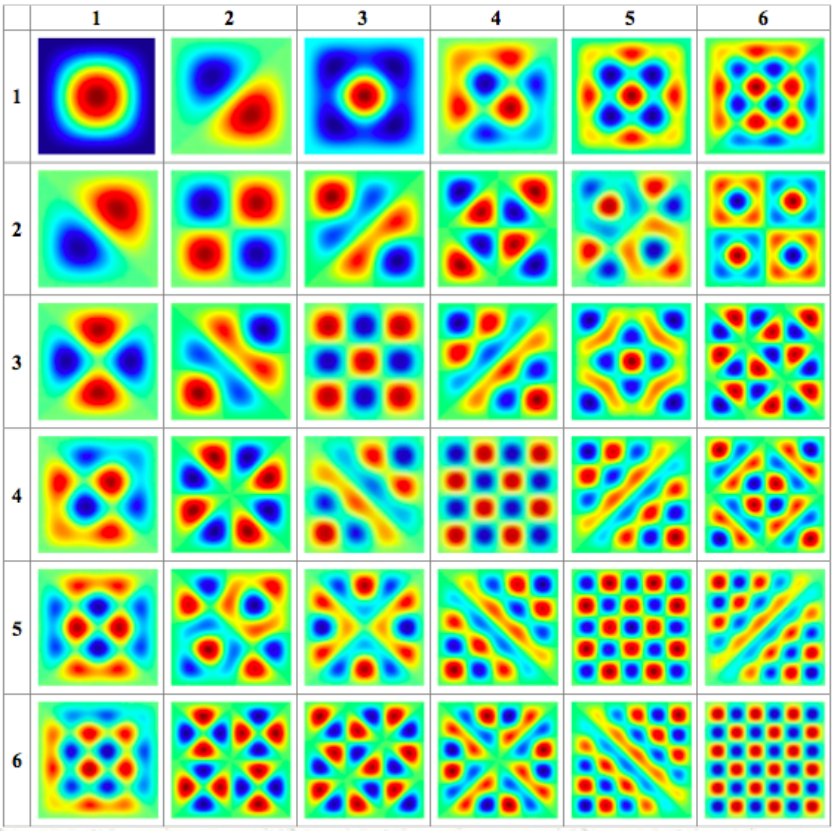
Slam-induced vibration characteristics of a Kirchhoff's plate.

Nabanita Datta and Armin W. Troesch

Doctoral students Oscar Tascon and Nabanita Datta at Cape Sounion (70 km from Athens) and the ancient Greek temple of Poseidon, God of the Sea.

A numerical dynamic analysis of impact-induced plate vibration is presented. The objective of the paper is to provide the dynamic response spectra for transient water-structure dynamics subject to typical impact loads and time scales, using one-way coupling between the fluid and the structure. The changing wetted surface is the prime complexity of the problem. The hydrodynamic pressure is assumed to be applied on the rigid plate, and then the plate is modeled to respond elastically. The structural vibrations are assumed not to influence the hydrodynamic pressure field.

Assuming small deflections of the Kirchhoff's plate, normal mode summation is used to calculate dynamic deflections in space and time. The total deflection is assumed to be a series summation of the modal deflections. The edges of the square plate are built in or clamped. Admissible 2-D functions have been estimated by Galerkin's method to generate plate modeshapes, and natural frequencies. These functions satisfy the boundary conditions at the four edges, e.g. the deflection and the slope of the deflection are zero at the ends.



The first 36 plate modeshapes of a Clamped-Clamped Kirchhoff's plate

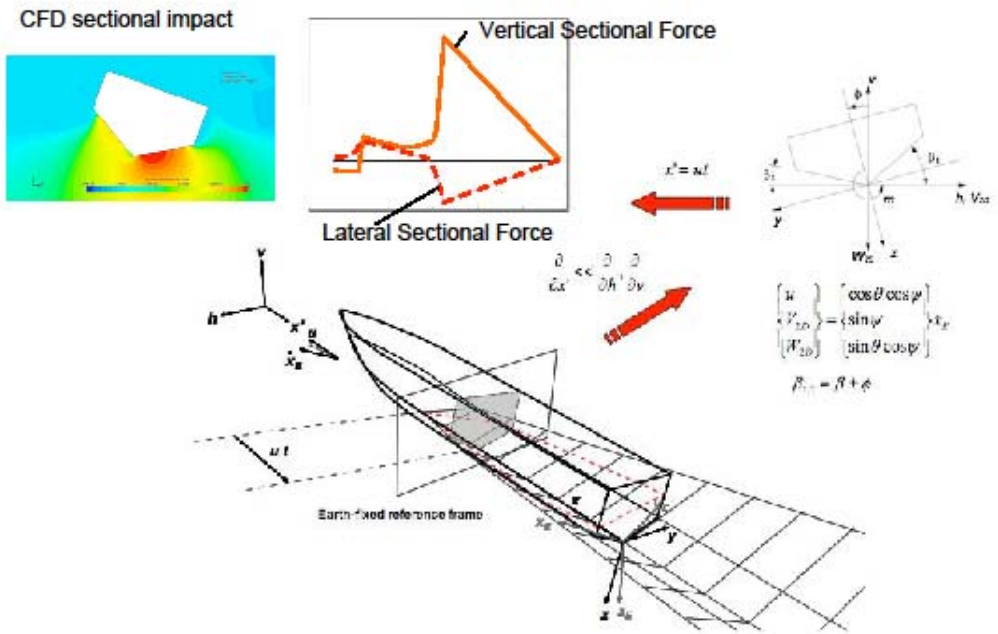
Numerical Computation of the Hydrodynamic forces acting on a Maneuvering Planing Hull via Slender Body Theory - SBT and 2-D Impact Theory

Oscar D. Tascon , Armin W. Troesch , Kevin J. Maki

Planing hulls due to their characteristics have been built for varied applications including recreation, racing, defense, police, search and rescue, among others. The small craft community requires tools to design power efficient, structurally durable, stable, and maneuverable vessels. If care is not taken, planing hulls will exhibit dynamic instabilities. The instabilities have been reported in the literature in both the vertical and the horizontal planes, e.g. Blount and Codega (1992). They include: rapid loss of running trim, progressive heeling, porpoising, chine walking, broaching, and sudden combined roll-yaw motion.

Most of the maneuvering problems are suspected to have their origin from coupling between the different degrees of freedom, suggesting the need for considering simultaneously the dynamics associated with six degrees-of-freedom (6-DOF). This need has given birth to 6-DOF planing hull simulators which rely on towing tank experimental results for the description of the external forces acting on the hull. Unfortunately, given the form of the expansion adopted to describe the external forces and moments acting on the hull, it is difficult to use them to investigate, in a form other than extensive simulation, the dynamics of the vessel. Even if an unstable case is discovered, it is not easy to trace back the causes of the instability to the model.

This work presented in the FAST 2009 paper investigates the application of Slender Body Theory (SBT) to steady asymmetric planing as a first step towards the computation of the hydrodynamic forces acting on a planing-hull maneuvering in calm water. The cross-sectional behavior of the planing hull is approximated by 2-D impact solutions. See the figure below. The commercial CFD program Star-CCM+® is used to obtain the force distribution on a heeled wedge impacting the water with vertical and horizontal velocities. The dynamic components of the generalized forces and moments acting on the vessel are found by integration along the hull of the 2-D forces and moments, using the SBT mapping. The approach is validated with the experimental results reported by Brown and Klosinski (1994a, b) and compared with the empirical formulae presented by Lewandowski (1997). The computational results show fair to good agreement with the experimental results, suggesting that the approach is promising.



Planing surface passing through earth-fixed plane

This is the abstract from a manuscript by Prof. Marc Perlin and doctoral student Zhigang (Kevin) Tian that has been accepted for publication in the Journal of Fluid Mechanics; the research was supported by the US Office of Naval Research through Grant No. N00014-05-1-0537. Research and understanding of deep water breaking waves is important for many reasons, both as regards naval architecture and natural & man-made environmental processes. Due to its significant role in air-sea interaction, its important effects on upper ocean dynamics and possibly climate change, and its impact on vessel/platform performance in extreme seas, wave breaking has received more and more attention recently. NA&ME researchers have been active in this area as illustrated by the following study, an outgrowth of the Multidisciplinary University Research Initiative (MURI) entitled "Optimum Vessel Performance in Evolving Nonlinear Wave Fields" sponsored by the Office of Naval Research. This large, multi-university program sought to determine a best path through a seaway by including remote sensing to determine the present sea, a predictive model to forecast the future sea surface elevations (wherein breaking plays an important, but to-date unknown role), the seakeeping and maneuvering associated with the vessel as it moves through the seaway, and a control system that seeks to optimize the ship's course.

(Zhigang is also the 2010 recipient of the College of Engineering's Ivor K. McIvor Award, presented to a graduate student in recognition of outstanding scholastic and research performance in Applied Mechanics.)

Energy Dissipation in Two-Dimensional Unsteady Plunging Breakers and an Eddy

Kevin Tian

An experimental study of energy dissipation in two-dimensional unsteady plunging breakers and an eddy viscosity model to simulate the dissipation due to wave breaking are reported. Measured wave surface elevations are used to examine the characteristic time and length scales associated with wave groups and local breaking waves, and to estimate and parameterize the energy dissipation and dissipation rate due to wave breaking. Numerical tests using the eddy viscosity model are performed and we find that the numerical results capture well the measured energy loss.

In our experiments, three sets of characteristic time and length scales are defined and obtained: global scales associated with the wave groups, local scales immediately prior to breaking onset, and post-breaking scales. Correlations among these time and length scales are demonstrated, which to the best of our knowledge, have not been reported before. Measured surface elevations are used to estimate the total energy and the energy loss due to wave breaking. The total energy and the energy loss are non-dimensionalized with the characteristic scales and we find that they scale well with the global and local wave steepnesses. In addition, for our wave groups, wave breaking onset predictions using the global and local wave steepnesses are found based on experimental results. The universality of these predictions for wave breaking requires further study.

Breaking time and breaking horizontal-length scales are defined, and they are determined with high-speed imaging. The time and length scales depend approximately linearly on the local wave steepness. The two scales are then used to determine the horizontal breaking-wave crest speed and the energy dissipation rate, which is the ratio of the energy loss to the breaking time scale. The dissipation rate is parameterized with the wave characteristics of local breaking waves; the resulting normalized dissipation rate is on the order of 10^{-3}. In general this is consistent with previous results, subject to proper data interpretation, but is one to two orders of magnitude greater than field measurements. Our experimental results show that the local wave steepness is correlated highly with the measured dissipation rate, indicating that the local wave steepness may serve as a good wave-breaking-strength indicator.

To simulate the energy dissipation due to wave breaking, a simple eddy viscosity model is proposed and validated with our experimental measurements. Under the small viscosity assumption, the leading-order viscous effect is incorporated into the free surface boundary conditions. Then, the kinematic viscosity is replaced with an eddy viscosity to account for energy loss. The breaking time and length scales, which depend weakly on wave breaking strength, are applied to evaluate the magnitude of the eddy viscosity using dimensional analysis. In addition, the value of eddy viscosity is assessed through a turbulence energy dissipation rate analysis, which provides estimations very close to those of the first method. The estimated eddy viscosity is on the order of 10^{-3} (m^2s^{-1}) and demonstrates a strong dependence on wave breaking strength. Numerical simulations with the eddy viscosity estimation are performed to compare to the experimental results. Both the magnitude and the trend of the total energy measured in the experiments as a function of space are approximated reasonably well by the numerical results. Good agreement as regards energy dissipation due to wave breaking and surface profiles after wave breaking is achieved, which illustrates that the simple eddy viscosity model functions effectively.

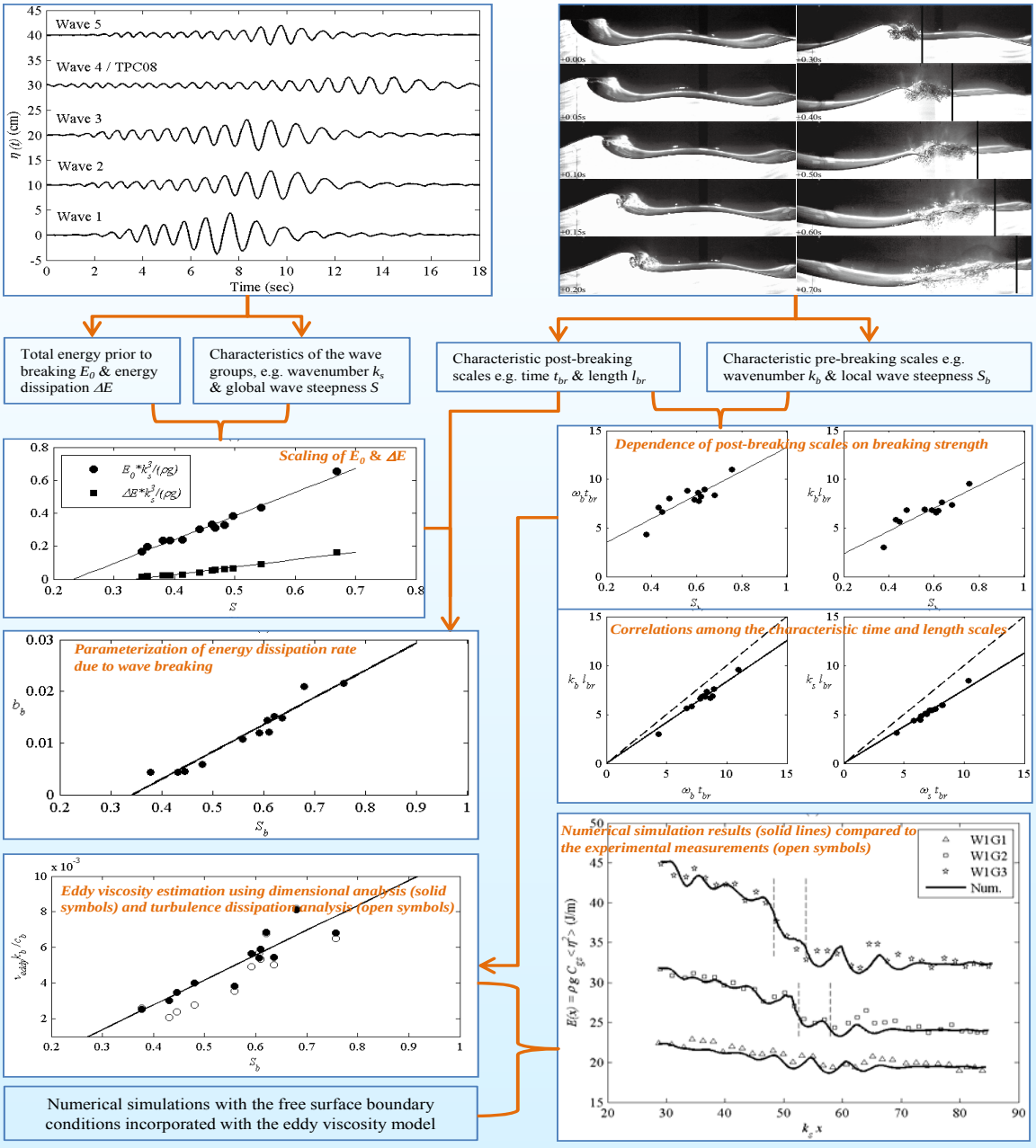


Figure 1 Flow chart of the research and primary findings

Peachman Lectures

Prof Thor Fossen delivered the 2009 Winter Term Peachman Lecture on March 5, 2009. The abstract of his talk follows.

Nonlinear Weather Optimal Positioning Control of Ships

Professor Thor I. Fossen, PhD

Department of Engineering Cybernetics

Centre for Ships and Ocean Structures (CeSOS)

Conventional DP systems for ships and free-floating rigs are usually designed for station-keeping by specifying a desired constant position (x, y) and a desired constant yaw angle, using Cartesian coordinates. In order to minimize the ship fuel consumption, the ship should be oriented such that the mean environmental force due to wind, waves and currents attack through the center line of the vessel to obtain a zero sway force and yaw moment.

Unfortunately, it is impossible to measure or compute the direction of the mean environmental force with sufficient accuracy. Hence, the desired yaw angle is usually taken to be the measurement of the mean wind direction which can be easily measured. In rough weather, however, this can result in large off-sets from the true mean direction of the total environmental force. The main reason for this is the unmeasured current force component and the waves do not coincide with the mean wind direction. Hence, the DP system can be operated under highly non-optimal conditions if fuel saving is the issue. A small off-set in the optimal heading angle will result in a large use of thrust.

One attractive method for computing the weather optimal heading is to monitor the resulting thruster forces in the x- and y-directions. Hence, the bow of the ship can be turned in one direction until the thruster force in the y-direction approaches zero. This usually requires that the power consumptions of the thrusters are monitored together with the azimuth and RPM/pitch angles. Pinkster and Nienhuis propose to control the x- and y-positions using a PID feedback controller where only derivative action is used for the yaw angle. This principle requires that the rotation point of the vessel is located in a certain distance fore of the centre of gravity, or even fore of the bow, and it also puts restrictions on the thruster configuration and the number of thrusters installed.

Prof. Fossen's presentation showed that a DP vessel exposed to unknown wind, wave and current loads had an analogy to a pendulum in the gravity field. The idea is to use polar coordinates and nonlinear backstepping. The main result is a weathervaning controller that does not require measurements of the environmental loads. The concept is referred to as weather optimal positioning control (WOPC). The concept can be used to stabilize a DP vessel in surge, sway and yaw using only two controls (surge force and yaw moment).

Prof Dick K. P. Yue delivered the 2009 Fall Term Peachman Lecture on October 29, 2009. The abstract of his talk follows.

Large-Scale Ocean Wave Simulations for Ship Operations and Motions Analysis

Professor Dick Yue, PhD

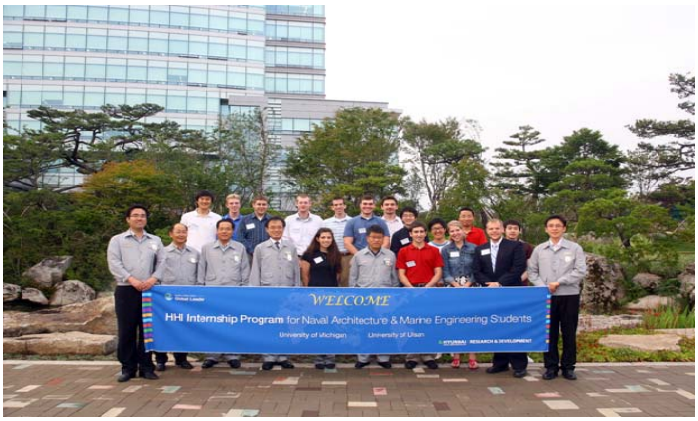
Department of Mechanical & Ocean Engineering at MIT

Recent advances in the understanding and modeling of nonlinear wave evolution, in computational algorithms, in capabilities of modern high-performance computing platforms, and in sensing technology providing high-resolution whole-field measurements, have opened new possibilities for the use of large-scale direct ocean wavefield simulations to inform and support ship operations and motions analysis. Unlike traditional description based on linear statistics and spectral information, these simulations provide phased-resolved description and forecast of nonlinear ocean wavefields, obtaining detailed information for the surface elevation, velocity and pressure fields. Large-scale simulations based on specification of the design sea state or on direct wave (and wind) measurements have now been performed for domains of O (103~4) km2. These simulations have been used to provide guidance and optimization for ship operations and path selection. Ensembles of such wavefield datasets have also been instrumental to understanding the mechanisms and quantifying the probability for the occurrence of rogue waves in the ocean.

Internships

A Korean Compilation

By Morgan Parker



Welcoming ceremony with UoM students, UoU students and sponsoring employees of HHI. This picture was taken near the main gate of the shipyard the day we arrived in Korea

In the spring of this year I was walking into the NA&ME building when Professor Troesch pulled me aside. He asked me if I would be the group liaison for the upcoming trip to Korea. I asked him what the job entailed, which was officially nothing. Unofficially I was to make sure that everyone came home alive and with Michigan's reputation intact. As expected, the wonderful students I traveled with made keeping us out of trouble easy. However, with liasionship had to come some responsibility, and I was appointed official keeper of the group's weblog. I figure that the most accurate impressions of our trip to Korea are the ones recorded at the time, so what follows are selected and abridged entries I kept throughout the trip. The complete version is online at:

http://umnamekorea2009.blogspot.com

What Is This Trip?

In 2008 the University of Michigan (UoM), University of Ulsan (UoU) and Hyundai Heavy Industries (HHI) formed a partnership for the exchange and education of naval architecture and marine engineering students. While the exchange of Koreans to Michigan is in its first year, two UoM groups have made it to Ulsan: One last year, and the one that you are reading about now.

Our trip is four weeks long. For the first three weeks we are touring HHI, and spending our last week taking courses at UoU. Three weeks to tour a shipyard you might ask? Well it is just that huge. HHI is the world's global leader in shipbuilding, producing more gross tonnage than any other yard.

Culture Tour Number One

On Saturday we took a 1.5 hour bus trip into the Korean countryside and visited three unique cultural sites. The first was Bulguska Temple. UNESCO designated this a world cultural heritage site and it is also Korea's official No. 1 Historic Place. It was originally built in the 700's, burned in various wars and rebuilt. Completely restored in the 1970's it is the most complete depository of Silla art and Buddhist culture in Korea. Interestingly all of the wooden structures were built with no fasteners, similar to a Lincoln log house. This method allowed the structure to flex in the event of earthquakes. Getting up to the temple involved a steep trail climb, along which there were numerous corn dog stands. In addition to the corn dogs, you could buy cooked beetle larvae, which tasted about like you would expect. Following Bulguska we visited the Seokguram Grotto, which is considered by Koreans to be the greatest piece of Buddhist art in the world. It is built into the side of a mountain, and contains a large and elaborate statue of Buddha. Pictures were not allowed inside the grotto because it violates Buddhist beliefs. We were able to purchase a roof tile, and paint it with our own design. In the next year or two this tile will be used to restore the roof of the grotto. Apparently, the ancient monks calculated the exact curvature of tile necessary to optimize rainwater drainage. I was interested to see the calculation, but no one seemed to understand my request. The tile to the right of the UM tile was prepared by our University of Ulsan counterparts.

These two tiles were painted by UoM and UoU students, and will be part of the restoration roof of the Seokguram Grotto

Tigers, Elephants and Captain Kirk

Globalism has allowed us to avoid severe cases of culture shock. My friend Tony can testify to that. Additionally, South Korea is not the rustic country that many envision, but a first world industrial superpower.

Hyundai Heavy Industries lives up to this reputation

(Continued on page 12)

(Continued from page 11)

proudly, and the view from our dorm includes two long legged Goliath beauties. These are the world's largest gantry cranes, rated at 1500 and 1600 MT respectively, the equivalent of approximately 320 African elephants or 17,777 healthy American males. The first crane was purchased from Kockums AB shipyard in Sweden, dismantled and shipped to Ulsan. I think HHI built the second larger crane themselves.

In fact, the South Koreans have pushed themselves where no man has gone before. Each dorm room is equipped with a working version of Captain Kirk's command post on the Enterprise. If Greg could read Korean, he would call down to Scotty for warp 10.

Our Typical Work Day

We are given a cordial greeting from Mr. Jeong, and then bussed to whatever department we are scheduled to visit. During the day we experience four major categories of events. Lecturing, which can be quite interesting depending on the topic, language ability of the speaker and time of day. Break time, which can be quite interesting depending on length, quality of coffee provided and whether or not one wins the euchre game. Lunch, which is ALWAYS interesting due to the new foods, familiar foods, and interaction with the average HHI employee. And lastly, the shop tour. Shop tours are the real meat of this experience. It is here that we really understand what is taught in the lectures and also the scale of shipbuilding.

The live weblog along with a very dear friend, Tony, and the stainless steel cereal bowl he prefers to inhabit over his claustrophobic box

Until one has stood on an engine larger than a duplex and costing more than an entire duplex development, the importance of "design decisions" goes underappreciated. At 5 P.M. we are back on the bus enroute to the dorm. At this point we are free to schedule the rest of our evening. Outings thus far have included the grocery store, department store, pool, karaoke (or "chair 2 H" in Korean characters), bar, club, beach and lastly no where. Weekday evenings can be quite lively, but

An exact model of Captain Kirk's command chair was in each of our dorm rooms. Despite engineering curiosity, we were wary of many buttons

usually end by midnight due to the early rise and the full day ahead of us. As for dinner, dorm food is always available, but pizza miraculously seems to appear in our stomachs on a regular basis. Some things are universal.

HHI, A Blast of the Past

Alas, the time has come for us to leave the employ of HHI. After three educational weeks, we are off to the University of Ulsan. Our time at HHI has been quite the experience. Our last week has been spent at the Hyundai Maritime Research Institute (HMRI) and Hyundai Industrial Research Institute (HIRI).

HMRI is about the closest thing we have experienced to our normal academic lives. Similar in focus to the Marine Hydrodynamics Laboratory at Michigan, HMRI has a huge towing tank, model shop, model propeller shop, cavitation tunnel and circulating water channel. In English, that means they test their ship designs in small scale. However a small-scale model of their Very Large Crude Carriers is still 25 feet long. I wanted to turn one into a fishing boat, but Greg convinced me it was not cost effective.

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[Warning: Engineering Language Follows]

HMRI also has a gravity wave tank. We got to predict the natural frequencies of vertical cylinders in heave, and then verify our predictions with a test. Because the cylinders were on the free surface, they told us to use 0.5*ρ*g*V for the added mass. Greg and I remembered that fully submerged this would be more like 0.1*ρ*g*V, so we were slightly skeptical. However, they actually moored the cylinder with four chains, changing the problem completely. In that case, their 0.5*ρ*g*V worked out to be accurate. For some reason I think they knew that was going to happen…

The other really neat thing at HMRI was the propeller cavitation test. The cavitation tunnel is a dark room, and they have a strobe light set up at the same frequency as the propeller RPM. The propeller was rotating at around 200 RPM, but appeared to be standing still. That way they could see the cavitation on each blade.

[End Warning]

The view from our HHI dorm rooms. A local high school is in the foreground, framed by HHI's Goliath cranes

After all the hardcore NA&ME work at HMRI, we were not all that interested in going to learn about steel microstructure and coatings (paint) at HIRI. We were all pleasantly surprised at just how nifty steel microstructure and paint could really be. They had small samples of welded steel joints, which we sanded and polished to a mirror finish, literally. Under 100x magnification no scratches were to be visible. Next, a diluted nitric acid solution was placed on the sample, which ate away at the cell boundaries, highlighting the microstructure. We then viewed the samples under a microscope and were educated about all the microstructures in the base metal, heat affected zone (HAZ) and the weld metal itself. It was pretty much like high school biology, except with steel. After that, we conducted a Vickers hardness test on the sample. Basically you indent the metal with a constant force, and then measure the size of the indent to determine hardness. We also witnessed a Charpy test (Guillotine for an innocent steel sample), and tensile test (drawing and quartering for an innocent steel sample). Our final workday at HHI and HIRI was the crowning glory: Shot blasting.

The barely noticeable barbed wire supports a small yet elegant yellow sign. Translated it reads something to effect of, "Danger! Minefield." The DMZ is not the place for a Sunday stroll in the woods…

It was a rainy day, and our guide took us outside and walked us around the back of the building. Awaiting us was what looked like a shipping container, with only a lock on the outside. My mother warned me about situations like this. Two people wearing red jumpsuits arrived, and they handed us a denim and leather set of pants and jacket. If the clothes from Bonanza were blue, these would be them. After donning the equipment, they wrapped our boots in leather and we put on heavy gloves. They opened the doors of the container and we stepped inside. Next, a hood with independent air supply was placed over our head, with a small glass viewport. Greg went first, and it seriously looked like something out of 2001: A Space Odyssey. An HHI man in the same getup was inside to manage the equipment and to help hold the hose. Without the heavy clothes and hood, the steel shot could easily shred all the flesh from an arm or leg, and eat through the bone if given a few seconds. The safety cartoons showed a man with a giant hole in him, and they were not kidding. The door was closed and locked behind us, and we blasted away. This entire experience was great fun. It was a perfect ending for our time at HHI.

DMZ

Al, He Man, Cory and I went to the DMZ today. The DMZ (Demilitarized Zone) is a 4km band of land that separates North and South Korea. It is more or less centered on the 38th parallel, and is technically a warzone. North and South Korea are still at war, a cease-fire being the only peace document in existence. Armed guards, lots of barbed wire and

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strict regulations abound. During the time immediately after the Korean War, over 700,000 land mines were placed throughout the DMZ. About 30% have been removed, but moving off the beaten path can be extremely dangerous. There are land mine signs everywhere, hanging from barbed wire. Since the war, the North Koreans have been digging infiltration tunnels into South Korea. Four have been discovered so far, the last one in 1990. It is believed that there are at least 17 more that have not been found. We went into tunnel number three, which is 73m deep and has a total length of ~1650m. Of course most of this tunnel is under North Korea. Civilians are able to get within 170m of the border, at which point the tunnel is blocked except for a small steel door. There are two more blocks, the last one being directly under the border. We touched the barbed wire, which represents the closest we were able to get to North Korea. Sorry, but we were not allowed to take pictures of the most interesting things.

Goodbye, Farewell and Amen: A Salute to Korea

So sitting on the youth hostel balcony in Seoul, we are now afforded the opportunity to reflect on our time in Korea. Since the last series of posts, we took several classes about Korea, spent the night in a Buddhist temple, had an Ulsan farewell party, tromped all over Seoul, and a few of us took an expedition into a warzone. It has been the week of weeks for our Korea trip, and our last memories here will likely be our fondest.

It is important to thank all those who made this trip what it was. Hyundai Heavy Industries, The University of Ulsan, and The University of Michigan were of course integral to our successes, so thank you. On a personal level, the real benefactors of this journey have been our Korean UoU student colleagues. They suffered our pain, shared our victories, and put up with us through our cultural ignorance. This not being enough, we can now legitimately call them friends, and that outcome could be the most valuable part of this experience. So Broski, Juneski, He Man, Q Force, Miss Young, Mr. Seo Helpful, our hats are off to you.

Korea is a wonderful country, and we have enjoyed it thoroughly. The national work ethic, culture and pride have been inspiring. The accomplishments of this country are not small, especially if you consider the timeline. We are proud to be associated with such a great nation.

This being said, it is time for the sons and daughters of wolverine nation to return home, and we are ready. Fate be willing, we should see some of you tomorrow.

-UM NA&ME Korea 2009

Bruce Rosenblatt and Associates

by Doug Rigterink

I spent the summer of 2009 working for Bruce Rosenblatt and Associates, LLC in Oakland, California. The bulk of the work that came across my desk was for commercial customers, mainly Chevron Shipping and Cascade Shipyard in Portland, Oregon. My days were occupied by stability and strength calculations for modifications of ships.

My main project for the summer was creating a Trim and Stability booklet for a ship conversion. The ship was being converted from a crane ship to a tracking ship. Massive amounts of weight were being removed and then some were being added to lower the GZ and increase the roll period. I also did Finite Element Analysis work for the Navy analyzing Underway Replenishment tools. At the end of the summer I was editing operation manuals for a Chevron FSO.

Outside of work, I enjoyed the Bay Area. Between free concerts in Berkeley, five dollar Athletics games in Oakland, biking around San Francisco, or taking road trips to Santa Cruz my free time was full. All in all it was an exciting summer filled with great experiences and opportunities.

Austal USA

by Beth Korkuch

This summer I was fortunate enough to spend my internship at Austal USA in Mobile, Alabama. After spending the year in the cold winter of Michigan learning theory from textbooks, I was eager to get out into the real world of shipbuilding and see how all of that glorious theory translated to the physical entity. There is nothing like some solid work experience to make you realize that you are in fact, excited about the field you have been studying with such diligence.

As a naval architecture intern at Austal, I rotated jobs approximately every two weeks. I worked my way through the design spiral in reverse, starting with crawling every inch of the new Littoral Combat Ship with the Testing and Activation field engineers, and finishing with work on the initial design of the proposed Joint High Speed Vessel. The benefit of moving through the design spiral in reverse is that I always entered my new position clearly conscious of how it would affect the downstream process.

While I was working with the Testing and Activation crew, the field engineers would always take time to point out the flaws in the as built ship which probably could have been prevented in the design phase. For example, the locations of the manual and automatic sounding tubes were placed in nearly impossible locations to reach at times. Or they would require an individual to put their head within inches of the spinning shaft in order to read the dial. Later in the summer, I was tasked with creating a sounding table using Hydromax software, and thus had to go find all of those sounding tubes. It is fair to say that I now have a personal understanding of how design decisions can make the life of those operating the vessel quite difficult.

Another early lesson of my internship was the need for clear and respectful communication between the workers on the shop floor and design engineers. Austal's yard is set up so that the design offices are right next to the production facilities and the pier so no problem is far from its source. I was amazed at the major disconnect that could exist across such a short physical space. Consequently, I have been inspired to be an engineer who listens to the words of the laborers, because they know a lot from their hands on experience that can be invaluable to me.

I spent my initial weeks crawling the ship and getting my hands dirty. I also worked on the shop floor, welding and fitting the initial structure of the modules being constructed. This was very hard work, but taught me about design within the realm of human capability. There are simply some spaces and angles in which one should not be expected to successfully weld.

Beyond my ship side experience, I also created the tank tables for the preliminary inclining trial, helped generate a bill of materials for the next in class and began working on initial decking arrangements. These office tasks would not have meant nearly as much to me if I had not had the previous experience of working on the ship. My internship experience has done exactly what it should have: taught me a bit about the industry in the real world, made me more excited about my studies, and it was a lot of fun.

Odense Steel Shipyard

by Aaron McCloud

The experience working in Denmark at the Odense Steel Shipyard was one of the most rewarding experiences in my professional career. The program that was scheduled for me was excellent. It put the pieces together that I was missing in my understanding of the value stream in shipbuilding. The program was very structured and each rotation was very fruitful. I was granted time to meet with key managers located throughout the organization.

The experience provided the exposure I needed before heading back into industry fulltime. I identified many implementable innovations that could be useful here in US shipbuilding, such as the development of robust strategic sourcing programs and the use of robotics. It will be interesting for me to discover in my career where innovation can be utilized and how to align it to firm strategy and increase the bottom line.

This picture illustrates cranes maneuvering a grand block for final erection

Computer Science Corporation

by Zenka Sellinger

Initially for this summer internship I was hoping to assist with projects where I could put my engineering background to use. This internship took a different but equally beneficial path. The projects I focused on were more research related and geared toward the type of things you don't necessarily learn in school.

The first project I was assigned was to research aluminum uses, problems, and new technologies encountered in Navy fleet shipbuilding. Aluminum is an ideal metal to use in shipbuilding due to its excellent strength to weight ratio; unfortunately it has quite a few knowledge gaps which researchers are attempting to fill.

The second major project I assisted with dealt with researching the newest, most innovative electric motors being manufactured. There are four main types of electric motors built by four different companies: advanced induction motor, permanent magnet motor, high temperature superconducting AC synchronous motor, and the superconducting DC homopolar motor. Many of the newer ships in the Navy's fleet (such as the DDG 1000 and CG(X)) are going to employ these motors making a general knowledge of them quite valuable.

I also had a small role in assisting with the acquisition process for a future contract CSC is bidding for. A team of us researched other companies' roles under the contract in order to help CSC beef up their bid. I found it very interesting to learn about the whole contract acquisition process. Again, this was something that you don't learn in school but is necessary in a professional position.

Overall this internship was a great experience. I have learned many valuable things that I probably wouldn't have looked into on my own. For example, I learned a bit about the Navy fleet such as the numerous types of ships, their roles, and classes. In school we learn about the theory behind shipbuilding so it was nice to get a better understanding, just for my own personal knowledge, of the different types of ships the Navy is building/ has built. Also, working in a professional office setting and being able to speak with other professionals in order to complete a task was a beneficial experience. I feel that I have made some great connections in the professional world and now have an overall higher confidence in my ability to work in an office setting.

Northrop Grumman

by Patrick Morris

This past summer I was on an internship with Northrop Grumman Newport News in Newport News, Virginia. I was placed in the Submarine Group of the Naval Architecture Department. At Newport News, the Submarine group is responsible for the planning yard and routine overhaul of Los Angeles class submarines, the construction of new Virginia class submarines, and research and development of new submarine classes.

During my time with the group, I was tasked with a wide variety of projects. I created a drawing in AUTOCAD of temporary alterations that could be added to the submarines. This is going to be used dockside to confirm what alterations have been done to each submarine. I also updated an Excel spreadsheet for the Newport News SNAME High School Boat competition. Before, the program was limited to monohull and catamaran designs. To allow for greater creative range, I modified the booklet to add trimaran and outrigger designs. In addition to the office work, I also had opportunities to go down to the shipyard and view shipbuilding in action. One weekend I was part of a waterfront group that completed an incline test for the SSN 779 the USS New Mexico, a newly built Virginia Class Submarine. Overall, my summer was full of challenges and opportunities to excel.

Summer in Shanghai

by Liliana Rodriguez

Before meeting up with my colleagues in Korea for the Hyundai Heavy Industries Internship, I was given the opportunity to work in Shanghai for Herbert Engineering Shanghai (HES) under the supervision of Robert Tagg. It was one of the most life-changing experiences that I've ever had. Growing up in a small town in Arizona, going to Phoenix was always an exciting adventure. Shanghai brought about the same feeling.

Upon landing, I immediately felt claustrophobic because of all the people bustling around me. Luckily, my boss (Rob) was waiting to pick me up; it was good to hear someone speak English. He informed me that we would be riding Shanghai's Maglev to reach our destination. A high-speed train which can reach speeds up to 311mph.

During my stay, I also visited the Shanghai World Financial Center (the second tallest building in the world), the Chai Tai Square (one of the biggest malls in the world), the Bund (famous historical boardwalk), and the largest shipyard when completed (CSSC's shipyard on Changxing Island). Even though Shanghai has about 20 million people living within its city limits, it seemed that everyone involved in shipbuilding knew each other, thus giving the feel of a small community. This became evident when my boss easily provided me opportunities such as visiting shipyards and touring LNG tankers.

At work, even though I didn't speak Mandarin, I found that I was able to communicate effectively. My coworker, Kevin, was an enormous help in my learning how to model ships with HECSALV (a program developed by HSSI.). Even after work was over, we had great times together by going out for karoke nights and dinner.

In China, I observed many aspects of their culture that differs from ours. For example, when men are hot, it is normal for them to walk around with their shirts above their stomach. Also, it is socially acceptable and fashionable to walk around in pajamas outside of one's house at night. Additionally, I noticed that men hold a woman's purse with delight. By the end of my internship, I wasn't even aware of people doing these things.

Overall my experience with HSSI was extraordinary. I thoroughly enjoyed both the challenges presented at work and the experience of living amongst a different culture. In the end, I am pleased to say that I made a new family in a place that I didn't expect.

Our condolences go to the families and friends of our recently deceased alumni.

Harper H. Hull, BSNAM 1942, passed away 8/22/09

Hugh S. Crim, BSNAM 1945, passed away 11/12/09

Timothy D. Hurd, BSNAM 1971, passed away 10/10/09

Marvin O. Miller, BSNAM 1950, passed away 5/15/09

Clark W. Stephens, BSNAM 1966, passed away 9/17/09

Robert L. DeRoo, BSNAM 1947, passed away 7/29/08

James W. Gray, BSNAM, 1671, passed away 4/30/09

Eric Schlageter, BSNAM 1974, passed away 3/15/09

William C. McKay, BSNAM 1940, passed away 2/26/09

Peter J.F. O'Reilly, BSMAN 1945, passed away 4/10/09

Otto H Klepper, BSNAM 1946, passed away 4/2/09

George A Dankers, BSNAM 1935, passed away 3/8/09

Roger Kline, MA, 1959, passed away 10/30/08

The following article was contributed by alumnus Marvin O. Miller (BSE'50) just before he passed away in May 2009. Marvin was an Underway Replenishment System Engineer at Port Hueneme Division, NAVSEA, at the time of his death.

Becoming a Seamanship Naval Architect

When I was a kid during the Great Depression I inherited a disreputable old 14 foot sloop with homemade sails that others called the "bait box." I sailed it on choppy San Francisco Bay with one hand on the tiller and the other hand bailing with a coffee can. During those sails I day-dreamed that my "bait box" was really a seaworthy 36 foot double ended ketch that I had designed and built and I was heading out the Golden Gate for the South Pacific and beyond. On graduating from high school I had a chance to serve a boatbuilding apprenticeship. For the next few years I was immersed in Port Orford Cedar shavings fitting planks and pulling hot white oak frames out of the steam box and bending into shape. I soon started planning on building my own 36 foot ketch.

At sea evaluation of replenishing a new ammunition package for a future class of ships. The tests were conducted by the Port Hueneme Division of NAVSEA off the Southern California coast.

World War II changed mine and 16 million other young American men's plans. I wound up in an Army unit and was sent to Europe where I operated a medium size landing craft. When the war ended veterans were offered the G.I. Bill that paid our tuition and books plus a few bucks a month. My now more mature mind was set on getting a degree in Naval Architecture. At that time there were just three Naval Architect Schools. MIT was basically limited to graduate courses; Webb was a small school for bachelors and I was married. The University of Michigan fortunately accepted me.

The basic Michigan Naval Architecture courses, in those days, were taught by Professor Henry Adams. The students in each class were a mix of undergrads and grad students. The only difference was the need for a "B" average for the grad students. Professor Adams advised that all of his tests applied equally to both grad and undergrad students. On one final test the average grade for the whole class was a "C." The next day there was a long line of complaining grad students outside Professor Adams's office; but he never changed a grade.

The department was run by Professor L.A. "Cap" Baier. We heard the "Cap" came from his having skippered, while a student, a sports fishing boat used for marlin. One time he gave us a task to design a propeller and we finally decided he had to give us more information. I was elected to plead our case. He finally agreed we needed more data and disappeared into the vault that was in his office (the door was like in a bank). After sometime he reappeared to give me the information. I never got to look inside his vault where apparently all the answers to Naval Architecture problems must have been stored.

Professor Charles Spooner taught Marine Engineering. He arranged for us to visit a shipyard in Toledo that was just completing replacing the original reciprocating steam engine on an ore carrier with a diesel engine; this was a first for The Great Lakes. The small diesel was almost lost in the huge engine room. It turned out later that the diesel had been sold by the manufacturer based on its maximum horsepower versus continuous duty. On the ship's first trip up to Lake Superior it blew pistons (and kept blowing them). Diesels really got a bad name on The Great Lakes after that mistake.

When I graduated in 1950 the shipbuilding business had collapsed. The NAME Department had received only two requests for graduates. I was offered one of the jobs which was at a Shipyard in Mississippi. I had trained near there on the Gulf during the war. The thought of starting a long career and raising a family in that muggy climate with its cockroaches and water moccasins was enough for me to turn down the offer and head home to San Francisco jobless. The next week I was looking for work at the San Francisco Navy Yard and they hired me immediately because one of their young naval architects had just quit to take the job I turned down in Mississippi! (It turned out his family lived nearby.)

My first two years as a naval architect were not exciting. Since I had a NAME degree, they assumed I should be in their Scientific Section. Much of my time was spent doing stability calculations for changes made to ships during their overhauls. I'm sitting there hand cranking a calculator just like I did for several of Professor Adams's classes.

The Korean War was then underway. The Navy was required to keep three aircraft carrier task forces off Korea supporting troops on the ground. Their combat logistics

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problem was that after three days the carriers and their destroyers had to stop their support and sail off to sheltered water to rendezvous with supply ships and replenish fuel and ammunition and sometimes food. The methods of replenishment while underway relied on seamanship and the equipment available on ships. The techniques were created by sailors out of wartime operational necessity. The fleet understood that time spent replenishing was time out of combat and our troops on the ground were endangered when the carriers weren't on their combat station. The Navy needed help to significantly reduce the time to replenish.

Evidently my complaining about my boring office work doing calculations got me assigned to head a small team sent to the aircraft carriers off Korea to optimistically solve the problem of sustaining the fleet at sea. What an eye opener to see this tremendous Maritime logistics system from factory to fighter that had just grown without any application of the systems engineering techniques that are inherent in naval architecture. Some of the functions that are essential only for replenishing ships while underway include:

- Designing supply ships with replenishment stations and cargo handling routes that line up with replenishment stations and handling routes on all surface warships.

- Maneuvering warships alongside a supply ship steaming on a hopefully steady course at 12 knots requires learning about hydrodynamic interactions between two ships the hard way to avoid collision but stay within 100 to 200 feet of the supply ship.

- Connecting up transfer rigs between the two ships by firing a light shot line and then hauling across heavier lines to a wire rope connected to other wire ropes and winches.

- Pulling large hoses across that are supported by wire ropes; connect and pumping 3,000 gallons per minute per hose.

- Transferring cargo (ammunition, stores or sailors) up to three tons using a trolley supported by wire ropes.

- Moving cargo around on deck with fork trucks or hand trucks while the ship is rolling, pitching and heaving with an occasional green sea on deck.

My work, following the Korean War studies, lead to establishing the Navy's only small technical group dedicated to developing safe and efficient Underway Replenishment (or Unrep) systems. One would suppose that now after 50+ years, if we did our job, there would be no more Unrep improvements needed. However, the Navy keeps changing with new ships that must be designed to effectively replenish as well as effectively fight and there are new types of supply ships and there are always new weapons and aircraft (whose heavy engines must be replenished). The American Society of Naval Engineers, ASNE Day 2009 paper "Underway Replenishment System Modernization," sets out a program that will keep "seamanship" naval architects busy for the next 50 years. Our Underway Replenishment Group moved to Southern California many years ago. We have a large, full scale Unrep Test Site next to our office that can do most anything you would need to do at sea except roll; but we have ships that take our experimental gear out to sea for the final testing. It's almost as much fun as designing and building as 36 foot ketch and sailing to the South Pacific.

"Seamanship Naval Architecture" is the art and science of replenishing ships while underway at sea day or night and includes integrating ship designs, ship handling capabilities, line handling techniques and cargo handling systems.

NEWS from the Marine Hydrodynamics Laboratories

Northslope Science Initiative

Launching BathyBoat to take bathymeter readings in one of the many lakes on the Northslope of Alaska.

Hunter Brown at the local Northslope "hotel" complete with bear deterrent protection.

BathyBoat taking measurements in a local lake and demonstrating its autonomous navigation capabilities.

As part of the North Slope Initiative, the MHL teamed up with Michigan Tech Research Institute to develop, test and deploy ALWAS (Automated Lagrangian Water Assessment System) buoys and to continue advanced development of Bathy Boat. The North Slope Initiative is an intergovernmental effort to increase collaboration at the local, state and federal levels to address the research, inventory, and monitoring needs as they relate to development activities on the North Slope of Alaska.

These "state of the art" extreme water body assessment platforms are operated autonomously for rapid, wide range, environmental sensing in the harsh conditions of the Alaskan North Slope. They carry a suite of water quality sensors that were used to create a baseline profile of the North Slope surface lakes for the Bureau of Land Management. This baseline profile will be used to assess any change in water quality of these kettle lakes due to ice roads built by the oil companies during the winter months.

UofM Tech Transfer "Celebrate Invention" Day

Tim Peters, Heidi Purcell and Hunter Brown discussing the Tidas 900 Buoy with a visitor to the Celebrate Invention event.

The Tidas Buoy was featured at the annual Celebrate Invention Event held by the Tech Transfer department at the Michigan League in October. This product is the result of a collaborative effort between S2 Yachts of Holland, Michigan and the MHL.

The design of this compact buoy makes it more cost effective and portable than any other buoy currently available on the market.

It is small enough to be easily towed to its mooring location making for an easy and cost effective deployment, and with its plug and play capability, it can host a variety of meteorological and biological scientific instruments.

2009 ACT (Alliance for Coastal Technologies) pCO2 Demonstrations

Sampling water during CO2 sensor deployment in Konehoe Bay, Hawaii.

Today, with atmospheric CO2 concentrations rising as a direct result of human activities, it is important to determine the capabilities for accurate and continuous monitoring of CO2 in not only the atmosphere but also the world's waters. CO2 readily dissolves in water, making the world's oceans and lakes important entities in the regulation of CO2 as both sources and sinks. In an effort to determine CO2 measurement capabilities in coastal areas, The Alliance for Coastal Technologies (ACT) performed a demonstration of pCO2 sensors in 2009. As Great Lake's Chapter of ACT, the MHL participated in this demonstration.

The Alliance for Coastal Technologies (ACT) is a NOAA-funded partnership of research institutions, resource managers, and private sector companies dedicated to fostering the development and adoption of effective and reliable sensors and platforms.

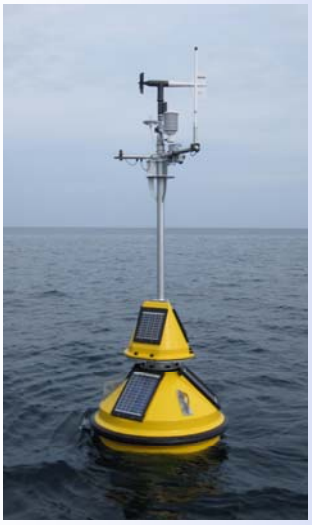
Senator Levin Visits the College of Engineering

Professor Meadows describing the operating capabilities of the Flying Fish and BathyBoat projects.

Over the summer, Senator Levin visited the Michigan Robotics & Autonomous Technologies Conference at the COE.

The purpose of his visit was to learn more about the robotics capabilities of the college for both civilian and military applications. As requested by the college, the MHL also attended, demonstrating the capabilities of the BathyBoat and the Flying Fish in the Lurie Reflecting Pond.

Glos Buoys and a Community Collaboration



Tidas buoy moored in Little Traverse Bay.

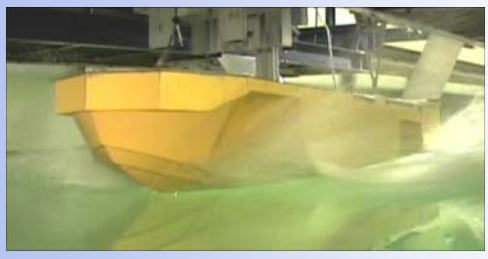
U-GLOS Station 004 was first deployed in Little Traverse Bay on July 30, 2009. This represents the first buoy of a series manufactured by S-2 Yachts in partnership with the Marine Hydrodynamics Laboratories.

This buoy also marks a first with a unique cooperative formed for the buoy's maintenance and care. The communities of Harbor Springs and Petoskey have collaborated to create a support organization that will be responsible for the deployment/retrieval and small maintenance of this buoy. Although the buoy was funded by the Great Lakes Observing System (GLOS), this local cooperative has made it possible to annually deploy the buoy.

The buoy measures wind speed and direction, air and surface water temperature, barometric pressure, solar radiation, and wave height, period and direction. This information is updated every ten minutes on the MHL website as well as the National Data Buoy Center website.

Testing at the Physical Model Basin

Amphibious Vehicle



Amphibious vehicle being tested in the physical model basin using the custom designed planing hull dynamometer.

Offshore Oil Platform

Oil platform awaiting seakeeping testing with infrared camera system passive markers. The camera system tracks a three dimensional model in a defined space.

Thermister Buoy Technology

Thermister Buoy deployed in Northern Grand Traverse Bay.

ALUMNI NEWS

Leigh S. McCue-Weill (PhD '04)

2009 recipient of Presidential Early Career Award

President Obama recently named 100 beginning researchers as recipients of the Presidential Early Career Awards for Scientists and Engineers, the highest honor bestowed by the United States government on young professionals in the early stages of their independent research careers. The recipient scientists and engineers will receive their awards in the Fall at a White House ceremony.

The Presidential Early Career Awards embody the high priority the Administration places on producing outstanding scientists and engineers to advance the nation's goals and contribute to all sectors of the economy. Nine Federal departments and agencies join together annually to nominate the most meritorious young scientists and engineers—researchers whose early accomplishments show the greatest promise for strengthening America's leadership in science and technology and contributing to the awarding agencies' missions.

"These extraordinarily gifted young scientists and engineers represent the best in our country," President Obama said. "With their talent, creativity, and dedication, I am confident that they will lead their fields in new breakthroughs and discoveries and help us use science and technology to lift up our nation and our world."

The awards, established by President Clinton in February 1996, are coordinated by the Office of Science and Technology Policy within the Executive Office of the President. Awardees are selected on the basis of two criteria: Pursuit of innovative research at the frontiers of science and technology and a commitment to community service as demonstrated through scientific leadership, public education, or community outreach. Winning scientists and engineers receive up to a five-year research grant to further their study in support of critical government missions.

Prof McCue-Weill is currently an assistant professor at Virginia Polytechnic Institute and State University, Blacksburg, VA.

Jeffrey Geiger (BS '83, MSE '84)

Jeff took over as President of Bath Iron Works on April 1, 2009.

Ted Garman (BSE '72)

Beyond racing my Snipe, I do not have much connection with the water these days. Professionally, I have been the Client Technology Manager for PACCAR Inc. for several years, providing corporate-wide policy and direction for PACCAR's PC's, Blackberries and other client devices. I also maintain close relationships with strategic IT partners such as Dell and Mircosoft. PACCAR is a major truck manufacturer with several noted global brands—Kenworth, Peterbilt, DAF and Leyland.

Connie Savander (BSE '91, MSE '94)

Alumna Constance (Connie) Savander, President of Maritime Research Associates, L.L.C., writes: "This is me at work in Singapore. The shipyard-supplied boiler suit was the right length but much too big in other areas. You can see that I had to wear an army issued green belt to take up the slack. I am wearing the standard safety gear required on board the SeaRiver. The harness is necessary in case you need to be hauled out of the tank via a winch. This would be the case if you have passed out, hurt a limb or something else to the point that you can't remove yourself from a tank, or you have expired.

My hands were yellow most of the time. After a few days, all you smell is crude oil and steel. It penetrates your body, hair, nostrils, and everything else. The odor didn't disappear until about a week after I returned home.

Of course I have experienced this many, many times before and didn't expect any surprises. However, this trip to Singapore was the longest period of time that I have been that stinky and required that much steam cleaning!! All in all, it was a great experience, I made a lot of new friends, collected a few more stories, and was thankful each day for the opportunity that was afforded by being a U of M naval architect."

NA&ME Alumni and Current Members Recognized at SNAME 2009 Annual Meeting in October 2009

Please join us in congratulating these NA&ME alumni as well as current students and faculty on their awards received and elective offices announced at the October 2009 SNAME Annual Meeting!

- Rosenblatt/Michigan Award Winner for 2009: Howard Fireman (BSE'79; MSE'85)
- Honorary Vice President: Naresh Maniar (BSE'56)
- Vice President
  - Central & Gulf Region: Joe Comer (BSE'80)
  - International Region: John Kokarakis (MSE'83; Ph.D'86,)
  - Atlantic South Region: Paul Cojeen (BSE'67)
- President (President-Elect): Ed Comstock (BSE'70; MSE'74)
- Treasurer: Bruce Rosenblatt (BSE'83)
- The American Bureau of Shipping - Captain Joseph P. Linard prize (best paper 2008 Transactions)
  - Jeff Falzarano (MSE'85; Ph.D'90)
  - Art Reed (BSE'69; MSE'71; Ph.D'75)
- David W. Taylor Medal: Joe Fischer (BSE'59)
- William W. Webb Medal: Bill Vorus (MSE'69; Ph.D'71)
- The Elmer Hann Award (best paper presented at the 2008 Ship Production Symposium)
  - Bob Keane (BSE'70)
  - Jeff Hough (BSE'78; MSE'79)
  - Howard Fireman (BSE'79; MSE'85)
- SNAME Fellow: Richard Rodi (BSE'66)
- Lloyds Register Educational Trust Maritime Technology Student of the Year Award: (2nd place), Jacob Ng (CURRENT STUDENT!) (Prof. Tassos Perakis, faculty advisor)

Michigan College of Engineering Homecoming Weekend 2009

From left to right Paul Bauerschmidt, Chair-CoE Alumni Board, Dean David Munson, NA & ME Alumni Merit Award Winner, Dr. Xin Sun, and NA & ME Dept. Chair Armin Troesch.

Xin Sun, 2009 recipient of the NA&ME Alumni Merit Award, is a Staff Scientist at Pacific Northwest National Laboratory in Richland ,WA.

The award recognizes Dr. Sun for her outstanding professional achievements and her contributions to the society.

Dr. Sun has a broad range of experience in the areas of applied mechanics and computational materials. Her expertise lies in applying the mechanics and materials' basic principles in solving practical engineering problems associated with solid oxide fuel cell design and analyses, advanced laminated armor materials development, joining and forming of advanced lightweight materials for automotive and heavy vehicle applications, advanced high strength steel modeling development, and lightweight automotive glazing design and development.

Dr. Sun received her undergraduate degree in naval architecture and ocean engineering from China's Shanghai Jiao Tong University in 1990. She then went on to earn two master's degrees and her doctorate, all from the University of Michigan at Ann Arbor.

In our continuing efforts to improve communication between you, our dedicated alumni, and the department, the *Nautilus* will now be available on the department's web page: http://name.engin.umich.edu. You will have the choice of continuing to receive paper copies of the newsletter, of being notified of its availability via email, or both. Please contact Kay Drake at kdrake@umich.edu if you would prefer to access the electronic version of the *Nautilus* via the NA&ME website or if you would like to take advantage of both options. Even if you do not want to change your mode of delivery, send us an email letting us know what you are doing. You are part of the Michigan family and we look forward to hearing from you.

Emeriti News—Retired NA&ME Faculty Member Finds Second Career

K. Peter Beier, Research Scientist Emeritus and Adjunct Professor, Department of Naval Architecture and Marine Engineering, retired in 2008. Prior to his retirement, in addition to teaching, he served as Director of the 3D Lab at the Duderstadt Center.

(Interviewed by Suzanne Taylor)

ST: Peter, I understand that you've started a new career since retiring from academia. How did you first get interested in pursuing the life of a movie extra?

PB: Well, I learned about the shooting for the movie, "Betty Anne Waters" on the University of Michigan campus and, specifically, at the Duderstadt Center, and I heard it might be possible to get involved at the lowest level, as an extra. I was curious to see how they make these big Hollywood movies. I researched it a little bit and enrolled myself as an extra. That's how I got in the movie as a so-called "featured extra." There are two kinds of extras, those you see moving around in the background and "featured extras," those on whom the camera focuses from time to time.

ST: Why do you think you were selected as a "featured extra"?

PB: I was entered in the database of a casting agency and they put together pictures of the extras from which the jury in a murder trial would be cast. After the director had picked most of them, he needed one more different kind of a guy, an elderly gentleman who looks a little wiser. They showed him my picture and he said, "That's the one." At least that's what I was told.

ST: So you really didn't have to audition per se.

PB: No. There was a casting call for extras in February of this year. It was published in the newspapers. When I arrived there on a very cold winter day there was a long line of about a thousand people, all hoping to become an extra in the movie, "Betty Anne Waters" with Hilary Swank. And here's where my academic background was helpful. I assumed the authoritative posture of a professor . . .

ST: . . . for which you had plenty of practice.

PB: . . . and walked right to the front of the line in such a way that the first guy in line opened the door for me thinking I was an official of some sort.

Prof. Beier with fellow juror Kate B. during a shooting break

ST: That's what I call acting!

PB: Yes, it's what actors do. But, I had pre-registered for a specific time and I thought I could do that. So, I went right up front and I was out in 20 minutes. Other people waited 6-8 hours after lining up as early as 7:00 a.m.

ST: So tell us a little about "Betty Anne Waters."

PB: "Betty Anne Waters" is a biography, a movie about a real person, Betty Anne Waters, who was on the set at times as an advisor. Hilary Swank plays her in the movie. She's a working single mother who puts herself through law school in an effort to represent her brother who had been wrongfully convicted of murder. After 18 years she managed to get her brother freed.

ST: And you played a juror, right?

PB: Yes, I played a juror. We jurors felt a little bit guilty because we knew the story line and my fellow jurors and I convicted the brother and put him in prison for life.

ST: So your first role as a movie extra was as a bad guy?

PB: Yes, but we couldn't know any better. The testimony was very convincing.

ST: Oh, I don't blame you, really. What else can you tell us about being in that movie?

PB: Well, there are many things; for example, the wardrobe dilemma for "Betty Anne Waters." According to the script, the court proceedings occurred over three days and for each of these days we were supposed to wear a different outfit. But they don't shoot it according to the actual timeline; they shoot it according to the camera positions. For each camera position you do Day 1, Day 2, Day 3. So we had to change our clothes continuously, in and out and in and out, and this needed to be done quickly because the entire crew was waiting for us.

ST: That movie was followed by a second movie, "Stone," with Robert De Niro and Edward Norton in which you played a corpse. What particular skills do you think you brought to that role? You didn't have to look professorial, right?

PB: No, but you had to look dead. And you had to hold your breath for quite a while and you couldn't move and you had to deal with all that bloody make-up. That's pretty much it – staying quiet and looking dead.

ST: Tell us about the make-up.

PB: In this movie, I was murdered in my bedroom with my wife and I'm wearing pajamas. On the set in an abandoned house they put the make-up on me. They created a big gash in my throat and

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put blood all over me. It was really sticky and ugly stuff. The main thing I had to do was lie there and Edward Norton comes and he looks at me with horror . . . [this line of conversation was discontinued since Peter had signed an agreement not to discuss the plot details of the film]. He ultimately empties a can of gasoline over me and sets me on fire. As he practiced how to do that, I shouted, "Wait a minute. What's in that can?" And Norton yelled to someone else on the set: "Peter wants to know what's in that can." And the answer was "It's just water." Norton said he'd try to avoid my face when he dumped it on me, which was nice of him. So when the camera was rolling he splashed this water, which happened to be icy cold, on me and some of it got on my face and my whole body jerked in response.

ST: Uh-oh. And you were supposed to be dead. And then you were burned.

PB: Yes, I was burned too but at that point, I'm no longer on the set, fortunately. You just see the house go up in flames. They use these flame devices and fire was shooting up everywhere. I was also dismembered. If you see a severed arm in the movie, it's not really mine; make-up can simulate that very well. Finally, you see the house burning from the outside. The shooting of the interior scenes was actually done at a different location from the exterior burning scenes. The interior scenes were done in an abandoned house in Jackson and the exterior burning house was somewhere in Dexter.

ST: Earlier this year, shortly after your second movie experience, you and I were talking in the hallway and you talked about walking down the street in Jackson in full make-up and startling the locals.

PB: Oh yes, that was funny. There's a rule that cast and crew must be fed every 5-6 hours. They adhere to that very strictly and even in the middle of shooting they stop everything and go to lunch. Now, in order to go to lunch, we had to leave the abandoned house and walk to a van, which would drive us to the lunch site. While walking on the street, the citizens of Jackson were staring at me and at the gash in my throat and the blood dripping all over; they were whispering, "he's in the movies." Some of them asked me to take pictures with their children. They used a special van for me because I was always dripping with blood; it had plastic sheets on the seats so I could sit down without messing up the van.

ST: You mentioned earlier that your work as a professor helped you get the juror role. Did all your work over the years with virtual reality play into any of this at all? Obviously, your blood wasn't real, rather somewhat virtual.

PB: Not really. One of the reasons I did this initially was that I was interested in how they make movies. In this movie they used traditional technologies; there were no animations or computer-generated parts. But to see all the cameras rolling and the sound and the lights used in making a Hollywood movie, it's quite amazing. On the call sheet for a specific day there were 145 people listed, only a few of them actors. The crew is really big: camera people, light and sound people, carpenters, electricians, caterers, production assistants, assistant directors, and more. It's a huge, huge undertaking but it runs like a smooth machine. For an outsider, it looks confusing, utter chaos. But they all know what they're doing and that's what it takes to make a movie.

ST: How long is your actual appearance in the film compared to how long it took to film it?

PB: When you're an extra on a movie set you have to have a lot of time on hand. Most of the time you sit around and wait until you're called to the set. My involvement in "Betty Anne Waters" lasted for three long nights. There was only night shooting because the courthouse they were using was in regular use during the day; the shooting started at 5:00 p.m. and went until 7:00 or 8:00 a.m. the next morning. A typical call is 8, 10, 12, sometimes 14 hours. And out of all those hours, you might be on the set for maybe an hour or sometimes only 10 minutes. And since they don't know when those 10 minutes are going to occur, you sometimes wait 10 hours for the 10 minutes to happen. It is recommended that you bring a book, or bring an iPod and listen to music. I brought several books but I never read any of them because you're together with so many interesting people. Extras, for example, come from all walks of life. Among the jurors on "Betty Anne Waters," there was a lady who was a hydroplane race driver. Obviously, our conversation involved a lot of naval architecture. Another elderly African-American lady who looked a little frail was a yoga instructor. She did yoga with us to pass time. And then we had a few jokers and we cracked jokes all night long. It was very entertaining, I have to say.

ST: You had an interesting interaction with Edward Norton on the set of "Stone." On the set of "Betty Anne Waters," did you meet any of the principals?

PB: As an extra, you're at the very bottom of the hierarchy but they treat you very nicely. However, you're not supposed to interact with the talent (that's what they call the stars – "the talent"). You leave the talent alone; you aren't supposed to ask for autographs or anything like that and normally you stay in the background and you do your little thing. But if you spend some time on the set one thing leads to another and sometimes you get very close to the talent. I remember that Hilary Swank in the courtroom scene had to cry in front of the jury and the amazing thing is she can really cry on the spot with tears and full

Prof. Beier with extras Matthew P. and Ken L. studying the call sheet of the day

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emotions. Then when the Director called "cut," she could not stop crying. She kept on crying and crying and her body was shaking while make-up and hair was waiting to fix her up . . . and then she did it all over again. I had read about her and she's known for that. When she cries, she really cries. The other actress I had a chance to talk to was Melissa Leo.

ST: Oh, yes. I remember her from "Homicide: Life on the Streets" on television.

PB: Yes, she plays a cop in the movie. And she had recently been nominated for an Oscar for her role in the movie "Frozen River." While I was waiting in line for a call on the set, the talents were sitting on their chairs with their names on them, and I happened to stand in front of her and she started talking to me, which was very unusual. The talents don't talk to extras. While she was talking, however, somebody called "Rolling" and that's a command for everything to be quiet in the whole building. Elevators are shut down, air-conditioners are turned off, and everybody falls silent. So our conversation didn't work out that time. But I ran into her again later and she recognized me and we talked about the making of her movie, "Frozen River." When you're a featured extra, you may have to interact with the director or assistant director. I had a little chat with John Curran, Director of "Stone." He's become famous for the movie, "The Painted Veil" and I talked to him and told him my wife was a fan of this movie. And I also talked quite a while with the writer of "Stone," Angus MacLachlan. He told me how exciting it was to see his words put into pictures. And with Edward Norton, of course, I had to interact with him directly on the set because he had to set me on fire. In my initial interaction with Norton, I was on the floor, it was very dark, a spotlight was on my face, I couldn't see anything, I had to stare up at the ceiling, there was blood all over me, and I had taken my glasses off . . . so I couldn't see who was coming toward me as he approached. I whispered, "Are you Mr. Norton?" And he whispered back, "Yes." So I replied "Nice meeting you" and he said "My pleasure." And then he spilled the water (aka gasoline) on me.

ST: What appeals to you most about this whole experience with the movie business? Fame? Fortune? Good food on the set?

PB: Most exciting are all the interesting people I met. These are people different from the people I meet in my normal academic environment. And seeing this big machinery working on making a movie, that was quite impressive. Before I took this job, I asked my son, who's an actor, if he thought I should do it. And he said, "Oh you definitely should. First, it's very impressive and you'll finally learn how movies are made; second, the food is good (and that was very true); and third, you'll meet interesting people." And he was right on all three counts.

Prof. Beier with his movie wife Mary Ann B. before being murdered on the set of "Stone"

ST: So your son is a movie actor. It runs in the family.

PB: A movie and stage actor and a writer too. He lives in New York.

ST: So now that you're into the movie business, do you think you and your wife are going to be moving to Hollywood soon?

PB: Since Michigan now has these wonderful tax breaks for movie makers, this is the right place to be. In Hollywood there's too much competition.

ST: Well, this all sounds very exciting; we look forward to seeing you in more films. Thank you very much for your time, Peter.

###

"Betty Anne Waters"

With Hilary Swank, Sam Rockwell, Minnie Driver, Melissa Leo

Director: Tony Goldwyn

Genre: Biography, Legal Drama

Plot: A working mother puts herself through law school in an effort to represent her brother, who has been wrongfully convicted of murder and has exhausted his chances to appeal his conviction through public defenders.

Release Date: 2010

"Stone"

With Robert DeNiro, Edward Norton, Milla Jovovich

Director: John Curran

Writer: Angus MacLachlan

Genre: Psycho Thriller

Plot: A convicted arsonist looks to manipulate a parole officer into a plan to secure his parole by placing his beautiful wife in the lawman's path.

Release Date: 2010

First International Ship Design & Naval Engineering Congress

Professor Emeritus Michael Parsons gave the Keynote Speech at the First International Ship Design & Naval Engineering Congress held in Cartagena, Columbia on March 25-27, 2009. The title of Mike's talk was "Applications of Optimization in Early Stage Ship Design" and featured recent advances by Mike and his students in the study of optimal ship design. The conference, which had international CNO (Chief Naval Officer) representation from European, North and South American navies, responded with significant interest to the ideas that Mike put forward. The editor is sure that Mike would happily share copies of his paper if you are interested.

Prof. Parsons retired in 2008. Although living in the Pacific north west, he continues his research activities, working with active UM faculty and collaborators at other universities.

QUARTERDECK NEWS

Greetings to all of our alumni from the members of the Quarterdeck Society. Quarterdeck is a growing group of students in the Department of Naval Architecture and Marine Engineering. We are dedicated to professional development, service to the Department and society, as well as coordinating social activities among peers. Our members would like to take this opportunity to give you an update on our activities.

Intramural Broomball

As the Department grows, so does the number of students actively involved with Quarterdeck. Our membership is currently approximately 100 students and we have a regular biweekly meeting attendance of about 40, both undergraduate and graduate students. Our students are involved in reaching out to the community to engage younger students in thinking about the marine industry. In this capacity, we were involved in Tech Day, put on by the college of engineering and in DAPCEP (Detroit Area Pre-College Engineering Program). We have also benefitted from the presentations of numerous companies throughout the year, who provide our students with a valuable connection to the current industry.

Sledding in the Arboretum

This October, many of our students also had the distinct privilege and pleasure of attending the SNAME Annual Meeting in Providence, Rhode Island. We particularly enjoyed the student design competition. Our students also took advantage of the great breadth of technical content available, attending many paper sessions and panel discussions. The Annual Meeting also gave our students an opportunity to meet the leaders of our industry, do some professional networking and connect with our alumni.

SNAME Meeting

Through the generous support of members of industry, the College of Engineering, the Department and our alumni, twenty seven students were able to attend the Annual Meeting. Our deepest thanks are extended to those who made this financially possible. If you have not yet had the opportunity to sponsor the activities of Quarterdeck and would like to, please go to our website: http://www.engin.umich.edu/societies/qd and look for the PDF donation form posted on the left hand side of the home page. Please print out and return the donation form to Kay Drake at the listed address. Also, if you are interested in the activities of Quarterdeck or wish to get in touch with our members, please feel free to contact me directly either by e-mail (bkorkuch@umich.edu) or by phone (609-477-2426).

Thank you once again to all of our alumni who are so supportive of the students of Quarterdeck and of the NAME department.

All the best,

Beth Korkuch

Commodore, Quarterdeck

CALLING ALL ALUMS AND FRIENDS OF NA&ME

- Do you have news to share? Career? Family?

Your latest adventure?

We would love to hear from you.

- Would you like to be a guest columnist in the

Nautilus?

We would love to discuss your ideas.

- Would you like to receive the *Nautilus* electronically?

Please contact Kay Drake at kdrake@umich.edu or 734-936-7636

Of Interest

The following item appeared in the College of Engineering's Fall issue of Michigan Engineer focusing on engineers in public service

Christopher Hart, PhD candidate, Naval Architecture and Marine Engineering

Before my studies here -- at the Ross School of Business and now in NAME -- I was a Special Operations officer in the Navy for 10 years. I did all sorts of things that I'm proud of, but the most meaningful was disarming roadside bombs in Iraq. I grew from a boy to a man in the military, and I'm proud of how the service guided that transition. I found that public service and service to others in general add color and depth to our otherwise selfishly shallow everyday pursuits.

As I said, I'm a NAME student going for my PhD. Before that I got my MBA from the Stephen M. Ross School of Business. I did my undergraduate work at the U.S. Naval Academy -- I was attracted there by the camaraderie I felt during a visit to the campus and, before that, by the moving fact that, at my grandfather's funeral, a gentlemen who had served with him on a ship in WWII traveled 1500 miles to Eastern South Dakota to attend. Right after I got out of Annapolis I went into the Special Operations community. Looking back, I think my military experience has helped me find the confidence, self-motivation and drive needed to succeed in a competitive educational environment like U-M's.

Just as teamwork is important in the military, it's very important in both the MBA and PhD programs. Having a mentor is also a key. Currently I have two. My academic mentor is my PhD advisor, Professor Nickolas Vlahopoulos. My business mentor is a "retired" professional from the energy industry. I'm lucky to have them in my corner.

Faculty offices downsized due to budget cuts

A gift from the class of 2009: Some graduating classes give their alma maters things like park benches, art works, fountains, etc. This is what the UM NA&ME Dept received.

Associates '09 is honored to present to you: The S/V Wigley Beagle

Due to the NA&ME department's desire for a new research vessel and the generosity of Associates '09, a new ship has been donated and anchored in front of the building. Its name reflects its hull shape and the tradition it follows in the path of other research vessels. It has many amazing features:

- Parabolic waterplane and wall sided construction for ease of hydrodynamic calculations
- Producible surfaces to lower construction costs
- Construction absent of rivets, eliminating the risk of seam failure
- A sail plan that can perform well at all points of sail
- Open deck for versatility of scientific missions
- Turbulence stimulators for scaling purposes

Welcome Lunch

September 2009

Halloween

October 2009

Would you care to do your share to advance our programs? Here's a convenient form to fill out:

Yes! I am Pleased to help the good cause with a gift of $ _____

CHECK ONE:

_____ Loyal Crew Endowment Fund

_____ NA&ME Scholarship Gift Fund

_____ R.B. Couch Memorial Scholarship

_____ Frank C. and Irving Pahlow Memorial Scholarship

_____ Henry Carter Adams II Memorial Scholarship

_____ George L. West.. Jr. Memorial Scholarship

_____ Raymond Yagle Memorial Fund

_____ Rosenblatt Scholarship

_____ Benford/Zimmie Scholarship Fund

_____ Charles Dart Fellowship

_____ Robert & Evelyn Kemp Fund

_____ Benford Discretionary Endowment

_____ Madge Roy Scholarship

_____ Carlton & Frances Tripp Mem. Scholarship

_____ Boykin Scholarship

_____ NAME Graduate Fellowship Challenge Fund

_____ My company will match my gift. The appropriate form is enclosed.

_____ I would rather pledge $ _____ for each of the next _____ years.

Signature _____ Date _____

Please make checks payable to University of Michigan and mail to Kay Drake, 2600 Draper Dr. Rm 219, Ann Arbor, MI 48109-2145

Naval Architecture and Marine Engineering

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