Welcome to the Spring edition of the quarterly Research Newsletter. The purpose of the newsletter is to share with the university academic community the accomplishments of our faculty in the publication of books, chapters, journal articles, conference presentations, exhibits, invited lectures, and awards during the previous quarter. We will announce research project awards and contracts and grants from philanthropic foundations that have been funded in the previous quarter. Periodically, we will include feature articles or matters of interest to the research community as well as honors and awards received by faculty.

Books

Leonard Orr (English)
*Timing is Everything.*
This collection of poetry, while self-standing, is a continuation of *Why We Have Evening*, published in 2010.

Recent Publications
Journal Articles and Book Chapters

Avantika Bawa (Fine Arts)
*Bawa, Avantika, Greg Minissale.* 2012. *Drain: Journal of Contemporary Art and Culture* (www.drainmag.com): Black: Issue16. This issue of *Drain* explores black as a superordinate concept, a natural kind, a material, a force, a virtual reality, a place of rest, a place of beginning, a fear, a celebration. Can it be seen as a container of becoming? How are informe, bassesse, the abject, the subconscious, parasitic upon it? How does it equivocally bring together both painterly flatness and depth, an abyss and a fullness?
Recent Publications
Journal Articles and Book Chapters

David Chiu (Computer Science)
Chiu, David, Stewart, Christopher, and McManus, Bart. 2012. “Electric Load Balancing through Low-Cost Workload Migration.” ACM SIGMETRICS Performance Evaluation Review, 40/3: 48-52. In this paper we present a real grid balancing problem experienced in the Pacific Northwest. We then propose a symbiotic relationship between data centers and grid operators by showing that mutual cost benefits can be accessible. Finally, we argue for a low-cost workload migration mechanism, and pose overarching challenges in designing this framework.

Jane Cote and Claire Latham (both Accounting)
Cote, Jane, Ph.D., Gentile, Mary, Ph.D. (Babson College), and Latham, Claire, Ph.D. “Giving Voice to Values: Practical Ethics in Action.” Accounting Education News, Winter 2012: 14-15. Giving Voice to Values (GVV) is a relatively new curriculum and pedagogy for teaching individuals how to develop a strategy and “scripts” to successfully address a values-based challenge and providing them the opportunity to practice their approach. This article provides measures of its success and presents an approach for successfully integrating the framework into a curriculum.

Michael Dunn (Education)
Dunn, M. 2012. “Response to Intervention: Three Student Case Examples of a School’s Implementation of Tiered Intervention Programming.” Learning Disabilities: A Multidisciplinary Journal, 18(3): 124-134. This project represents a longitudinal study of a Pacific Northwest elementary school, which designed its own RTI model in 2006 and has worked to implement a tiered-intervention process for literacy skills. Three children represent the purposeful sample as to how they progressed through tiered programming. The authors discuss the school’s RTI processes and makes recommendations as to how the model could evolve to better facilitate instruction and assessment as children move through the tiers.

John Harrison (School of the Environment)

John Harrison (School of the Environment)
Deemer, Bridget, Goodwin, Kara, Lee, Tammy, Birchfield, Keith M., Dallavis, Kassi, Emerson, Josh, Freeman, Dawn, Henry, Erica, Wynn, Louise, and Harrison, John. 2012. “Elevated Nitrogen and Phosphorus Concentrations in Urbanizing Southwest Washington Streams.” Northwest Science, 86(4): 237-247. This paper, which was written by students in Harrison’s Watershed Biogeochemistry course, synthesizes available nutrient data for Clark County streams and compares nutrient concentrations in these streams with established baselines. It suggests that Clark County streams have nutrient concentrations that are strongly elevated over background levels.
Recent Publications continued
Journal Articles and Book Chapters

Tutku Karacolak (Electrical Engineering)
Ung, J.W., and Karacolak, T. 2012. “A Wideband Implantable Antenna for Continuous Health Monitoring in the MedRadio and ISM Bands,” Antennas and Wireless Propagation Letters, IEEE, Vol 11: 1642, 1645. In this paper, a small-size, dual-wideband implantable antenna operating in the MedRadio and ISM bands is designed and in vitro tested. The antenna is intended for continuous health-monitoring applications and is optimized to operate within human skin of various ages, body sites, and genders. The optimized antenna has overall dimensions of 18 mm x 16 mm x 1.27 mm and measured bandwidths of 278 MHz (56%) for MedRadio and 870 MHz (33%) for ISM bands.

Tutku Karacolak (Electrical Engineering)
Karacolak, T., Cooper, R., Unlu, E.S., and Topsakal, E. 2012. “Dielectric Properties of Porcine Skin Tissue and In Vivo Testing of Implantable Antennas Using Pigs as Model Animals,” Antennas and Wireless Propagation Letters, IEEE, Vol 11: 1686-1689. In this paper, the dielectric properties of the porcine skin tissue are measured between 300 MHz and 3 GHz and fitted to a three-pole Cole-Cole model. The obtained data indicate that porcine tissue may be applicable for in vitro and in vivo measurements of medical applications intended for human tissues. Two sample implantable antennas designed for human body are in vivo tested in porcine subjects, and both antennas operated as they would in human tissue. Implantable systems tested within porcine tissues provide expected responses when implanted in a human.

Dave Kim (Mechanical Engineering)

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Sarah Kooienga (Nursing)
Lynott, Michelle H., Kooienga, Sarah A., and Stewart, Valerie T. 2012. “Communication and Electronic Health Record Training: A Comparison of Three Health Care Systems.” Informatics in Primary Care, Vol 20(1): 7-12(6). The findings of a focused ethnographic study examining computer training in three health care systems in the Pacific Northwest was discussed. The results demonstrate that only one system had communication training in their classes. Using the computer in the examination room necessitates communication training.

Gretchen Rollwagen-Bollens (School of the Environment and School of Biological Sciences)

Gretchen Rollwagen-Bollens (School of the Environment and School of Biological Sciences)
Recent Publications continued
Journal Articles and Book Chapters


Praveen Sakhar (School of Engineering and Computer Science) Sekhar, Praveen K., Brosha, Eric L., Mukundan, Rangachary, Mekonen, Hanna, Farber, Boris, Kreller, Cortney, and Garzon, Fernando H. 2012. “Packaging and Testing of a Hydrogen Safety Sensor Prototype.” *International Journal of Hydrogen Energy*. 37/19: 14707-14713. In this article, testing of an electrochemical, potentiometric hydrogen safety sensor is reported within a proposed packaging scheme. Device packaging under static and flow testing conditions are presented. During the static volume sensor testing, the sensors response is compared against a calibrated Gas Chromatography (GC) measurement. Also, a commercial H2 sensor is incorporated into the test chamber to act as a benchmark for the sensor prototype. In the testing phase, H2 selectivity is demonstrated using pulsed discharge technique.

Jie Xu (Mechanical Engineering) Hashmi, Ali, Yu, Gan, Reilly-Collette, Marina, Heiman, Garrett, and Xu, Jie. 2012. “Oscillating Bubbles: a Versatile Tool for Lab on a Chip Applications.” *Lab on a Chip*, 21/12: 4216-4227. We reviewed the use of oscillating bubbles for lab on a chip application. We first briefly summarized current understanding of the physics of oscillating bubbles, and then critically summarized recent advancements, including some of our original work, on the applications of oscillating bubbles in microfluidic devices. We highlighted the advantages of using oscillating bubbles along with the challenges that accompany them.

Jie Xu (Mechanical Engineering) Bajwa, Abdullah, Xu, Yuhao, Hashmi, Ali, Leong, Matthew, Ho, Ly, and Xu, Jie. 2012. “Liquid Marbles with In-Flows and Out-Flows: Characteristics and Performance Limits.” *Soft Matter*, August 2012: 11604-11608. We characterized the breaking, buckling and deformation of a liquid marble upon liquid exchange via external inflow and outflow. During liquid addition, the breaking of liquid marbles was affected by the existence of a swirl flow pattern. During liquid removal, the liquid marbles buckled and their morphology was controlled using penetrating pins. During a zero-net-flow perfusion process, the shapes of liquid marbles were controlled by the arrangement of the inlets and outlets.

Jie Xu (Mechanical Engineering) Hasmi, Ali, Xu, Yuhao, Coder, Benjamin, Osborne, Paul A., Spafford, Jonathon, Michael, Grant E., Yu, Gan, and Xu, Jie. 2012. “Leidenfrost Levitation: Beyond Droplets.” *Scientific Reports*, 2: 797. Enlightened by the Leidenfrost effect—a droplet can be levitated by its own vapor layer on a sufficiently hot surface—we demonstrate for the first time that a small cart can also be levitated by Leidenfrost vapor. The levitated cart can carry certain amount of load and move frictionlessly over the hot surface. We also show that the levitated cart can be self-propelled over a ratchet shaped horizontal surface. If perfected, this frictionless Leidenfrost cart could be used in numerous engineering applications where relative motion exists between surfaces.
**Recent Publications continued**

**Journal Articles and Book Chapters**

**Wei Xue** (Mechanical Engineering) Zhao, Jiheng, Sheadel, Debra A., and Wei Xue 2012. “Surface Treatment of Polymers for the Fabrication of All-Polymer MEMS Devices.” *Sensors and Actuators: A. Physical*, 187(11): 43-49. Polymer microelectromechanical systems (MEMS) have received considerable attention due to their low cost, remarkable biocompatibility, and high flexibility when compared to glass and silicon devices. In this paper, we demonstrate the fabrication of an all-polymer device. An SU-8–SU-8-PDMS sandwiched structure is used in this research because SU-8 enables alignment capabilities during the fabrication process. The knowledge obtained from this research can enable the development of novel all-polymer MEMS devices for biomedical applications.

**Recent Presentations**

**Conference Presentations, Exhibits, Invited Lectures, Awards**

**Avantika Bawa** (Fine Arts) created a solo installation, *Cocktail #ff0080* for the ‘Art in Rural Storefronts’ project in Philomath, OR. It was curated by Hester Coucke through the Art Center of Corvallis, Corvallis, OR. Also, she was part of the exhibition, *Drawers Drawing* at Julius Caesar Gallery and Peregrine Program, Chicago, IL. It was curated by c. Gundesdorf and Eric Lebobsky. Also, Ms. Bawa delivered a public lecture at the Benton County Historic Museum and Society, Philomath, OR.

**Cory Bolkan** (Human Development) presented with WSU Vancouver undergraduate student Hodeis Tabatabaei-Moghaddam at the 65th Annual Scientific Meeting of the Gerontological Society of America (GSA), November 11-14, 2012. They presented pilot study research: "Measuring Meaningful Time Experiences in Intergenerational Relationships.” In addition, she presented a paper for a symposium on "Assessing the Needs of Older Adults in Nicaragua” at GSA and also was a co-author on a third presentation titled "Spiritual Support for Older Patients with PTSD in Primary Care” at GSA.

**David Chiu** and **Farhana Kabir** (both Computer Science) presented their research on "Reconciling Cost and Performance Objectives for Elastic Web Caches” at the 3rd IEEE International Conference on Cloud and Services Computing in Shanghai, China from November 22-24, 2012. Their presentation consisted of self-scaling data cache, which is distributed over multiple cloud nodes, that intelligently provisions resources at runtime based on users’ cost and performance expectations, while abstracting the various low-level decisions regarding efficient cloud resource management and data placement within the cloud from the user.

**Michael Dunn** (Education) was presented with Organization of Teacher Educators in Reading’s Outstanding Article Award, 2012. OTER is an International Reading Association special interest group. The award was for Michael’s 2011 published article in OTER’s *Journal of Reading Education* about teachers’ suggested best practices for writing instruction.

**Linda Frederiksen** (Library) was an invited presenter at the 10th TexShare Interlibrary Loan Online conference on November 15, 2012. Her session titled “Ebooks and ILL: Turbulent Waters” focused on issues related to the use of electronic books in libraries.

Recent Presentations continued

Conference Presentations, Exhibits, Invited Lectures, Awards

Sarah Kooienga (Nursing) presented at the Contemporary Ethnography across the Disciplines (CEAD) conference Hamilton, New Zealand. Nov.21-23rd, 2012. She presented results of her research study “Rural patients, Nurse practitioners and the Electronic Health Record: an ethnographic analysis.”

Brett Oppegaard (Creative Media and Digital Culture) earned the regional George and Helen Hartzog Award, for Outstanding Volunteer Service to the National Park Service. As the Pacific West Region representative, he was chosen from among about 80,000 volunteers, contributing to sites throughout Washington, Oregon, California, Idaho, Nevada, and Hawaii, including such prominent places as Yosemite National Park, Mount Rainier National Park, and Joshua Tree National Park.

Stephen Solovitz and Dave Kim (both Mechanical Engineering) presented their research on “Evolution of Vent Geometry for High-Speed Jets” at the ASME IMECE Conference in Houston, TX, from November 9-15, 2012. This interdisciplinary study, completed with geophysicists at UCSD, will be used to understand the development of volcanic eruptions. Also, they presented their findings on vent evolution at The American Geophysical Union “AGU” Fall Meeting in San Francisco, CA, from December 3-7, 2012. Also, Dr. Solovitz was a co-author on the “Hydraulics of Earthen-dam Breaching,” which presented the “AGU” Fall Meeting in San Francisco, CA from December 3-7, 2012. This study, led by a team at the USGS Cascade Volcanoes Observatory, considers experimental measurements of fluid/solid development in a breached dam.

Brian Tissot (School of the Environment) presented his research on “Sustainability in the Marine Aquarium Trade” at the Western Society of Naturalist conference in Monterey, CA, Nov. 8-11, 2012. Other presenters at the conference from Tissot’s lab were Emily Munday (“Effects of Collection, Transport and Holding Practices on Yellow Tang Health, Stress, and long-term Survival” and Katie Wrubel (“Fish-habitat Associations within the Olympic Coast National Marine Sanctuary”).

Jie Xu (Mechanical Engineering) chaired two sessions in the ASME International Mechanical Engineering Congress & Exposition in Houston on November 9-15. His team, including three graduate students and one undergraduate student, delivered nine presentations at the conference on a variety of topics related to microfluidics. His student Ali Hashmi won an NSF travel award to support his trip to the conference and won a Best Presentation Award at the conference.

Funded Research

Stephen Bollens and Gretchen Rollwagen-Bollens, Bonneville Power Authority - $613,283 Enhanced Monitoring and Investigation of the spread and impact of aquatic invasive mussels in the Columbia River Basin.

Allison Coffin, HHS-NIH - $135,900 p53 and aminoglycoside-induced hair cell death in the zebrafish lateral line.

Joseph Cote, Small Business Growth Mentor & Analysis Program (MAP) WSU Foundation - $40,000

John Harrison, NSF Water Sustainability and Climate, ultimately funded by USDA - $1,495,640 (over four years) Watershed Integrated System Dynamics Modeling (WISEM): Feedbacks among biogeochemical simulations, stakeholder perception, and water policy. (Project PI: Huyck-Orr, WSU Vancouver Portion $256,000; WSUV PI: Harrison)
Also, Supplement to Collaborative Research: NSF ULTRA-Ex: Collaborative Research: How do feedbacks between governance and biophysical systems affect resilience of urban socio-ecological systems? - $88,000 (over 1 year)
(Overall Project PI: Yeakley, WSU, Vancouver portion: $21,000; WSU PI: Bollens, S.M., Co-PIs: Harrison, Rollwagen-Bollens, Stephan, and Thiers).
Funded Research continued

Laurie Mercier, Washougal School District - $26,160
Teaching American History

Brett Oppegaard and Dene Grigar,
National Endowment for the Humanities - $19,421
Grand Emporium of the West: Experiments in Tablet Computing Design for Middle School History Classes. This "We the People" Special Projects Grant was awarded to our Fort Vancouver Mobile research team to continue to explore the pedagogical possibilities of tablet computing; this time within the context of middle school history classes nationwide. We, in turn, are sharing digital media of the rich history of Fort Vancouver as an avenue to explore themes related to 19th-century frontier life -- including issues of multicultural diversity, colonization, and subsistence -- through the affordances of mobile technologies.

Cheryl Schultz, DOI-BLM - $20,000
Response of Fender’s Blue Butterfly to Large Scale Habitat Restoration in Critical Habitat.
Also, DOI-BLM - $34,000
Influence of West Eugene BLM’s Resource Management Plan Alternatives on Connectivity for Fender’s Blue Butterfly.

Praveen Sekhar, Bonneville Power and Administration - $4,990
Learning Fundamentals of Hydropower Production through Hands-on Experiments. The goal of this education project is to create awareness and understanding of the fundamentals of hydropower production for students in the Pacific Northwest. In order to achieve this goal, the objective of this initiative is to design and execute a fun-filled, hands-on and interactive camp focusing on steps involved in the generation of hydropower. Also, Museum of Science, Boston, MA - $2,990
Revising the Nano Summer Camp Curriculum. The objective of the mini-grant initiative is to revise the Nano Summer Camp curriculum to include hands-on synthesis of nanostructures by purchasing a tube furnace and green chemistry kit.