Harold A. Richards

harry@utk.com (865-599-4553)

Profile

Interdisciplinary scientist with graduate degrees in nutrition and plant biotechnology and postdoctoral research in food science and microbiology. Led a start-up company that explored the potential viability of commercializing University of Tennessee intellectual property in the agricultural biotech market. Directed a prestigious National Science Foundation graduate training program at UT designed to train the next generation of computational biologists.

Areas of expertise:

- Genetic Characterization
- Plant Biotechnology: Genetic Engineering
- Interdisciplinary Research Programs
- Entrepreneurship and industrial research
- Food Pathogen Risk Assessment

- Cross-curricular instructional design
- Grant writing and proposal development
- Design of graduate education programs
- Budget planning
- Mentorship of undergrad and grad students

Education

PhD Nutrition Science and Biotechnology - UNC, Greensboro   2002

MS Life Sciences, Plant Physiology and Genetics - University of Tennessee   1998

BS Botany and Environmental Science - Miami University, Oxford   1995

Professional Experience

Project Director – SCALE-IT Fellowship Program (University of Tennessee 2012 – Present)

- Managed budget for multimillion dollar graduate training program
- Supervised administrative assistant
- Conducted duties of Program Manager

Program Manager – SCALE-IT Fellowship Program (University of Tennessee 2008 – Present)

- Mentored 24 PhD level graduate students through all stages of graduate school including selecting advisers, planning research programs, and pursing post graduate careers
- Built a multidisciplinary learning community for doctoral students based on a cohort model
- Managed the development and growth of an interdisciplinary graduate training program integrating high performance computing and computational biology
- Planned and conducted an extensive student recruiting effort including efforts to attract underrepresented students in STEM disciplines
- Designed and implemented new programming elements including the Science Communication Center, cross-disciplinary training curricula, and student-centered group research projects

- Planned and coordinated faculty development workshops on the creation and use of "case study-based" curriculum for undergraduates

President and Director of Research – MycoGenomix, LLC (2005 – 2009)

- Developed two methodologies for an insecticidal protein discovery platform involving both genomics and proteomics based approaches
- Organized and presided over MycoGenomix from early stage seed company to Phase I research and development
- Secured seed funding, angel investors, and SBIR grants
- Hired and managed research staff, negotiated stakeholder contracts, and managed budgets

Postdoctoral Research Associate – UT Food Safety Center of Excellence (2002 – 2005)

- Coordinated a multi-state food pathogen risk assessment project to study *E. coli* O157:H7, *Listeria*, *Campylobacter*, and *Salmonella*
- Supervised and trained graduate and undergraduate students in a microbiology lab using bacteriological detection methodology
- Developed rtPCR and microarray-based detection tools for microbes in farm samples
- Assisted in the design and development of an integrated food safety curriculum for use in middle school programs, including the implementation of teacher training workshops

Graduate Research Assistant – UNC, Greensboro (1998 – 2002)

- Genetically engineered canola to express GFP and Bt transgenes
- Conducted food safety research of GFP and GMO canola plants
- Evaluated potential allergenicity of GFP
- Genetically engineered alfalfa to express GFP and edible vaccine transgenes
- Supervised and trained undergraduate students in molecular biology techniques

Graduate Research Assistant – University of Tennessee (1995 – 1998)

- Genetically engineered orchardgrass and switchgrass to optimally express GFP

Undergraduate Research Associate – Miami University (1993 – 1995)

- Modeled population dynamics of rainforest palm species to assess impact of sustainable agricultural practices

Teaching Experience

Lead/Co Instructor

LS595 Survey of Biology for Computational Scientists (University of Tennessee 2012 – 2013)

- Course to train computer science graduate and undergraduate students in key concepts related to computational biology research using inquiry-based learning and guided discourse

FDST521 Food Toxicology (UT 2005)

- Facilitated a journal-based, round table discussion of emerging topics in food safety

FDST590 Effective Research Presentation Skills (UT 2004 – 2005)

- Instructional course to guide students toward improved scientific presentations skills

FDST429 Food Microbiology Laboratory Practices (UT 2002)

- Used a deductive reasoning lab model combined with guided discourse to teach food science and microbiology undergrads how to identify food borne pathogens

NUTR201 Introductory Nutrition Science (UNC – Greensboro 2001)

- Taught year-long course in general nutrition to more than 150 undergrads. Received the Outstanding Graduate Student Teaching Award – College of Human Environmental Sciences

BIO191L General Biological Sciences Laboratory (Miami University 1992 – 1994)

- Served as an undergraduate teaching assistant and was lead or co-lead instructor for four semester of freshman biology

University Service

Internal IGERT Selection Committee – UT Office of Research and Engagement (2013)

Graduate Student Selection Committee – UT Interdisciplinary Graduate Program in Genome Science and Technology (2009 – 2013)

Curriculum Programming Committee – UT Interdisciplinary Graduate Minor in Computational Science (2009 – 2014)

Outreach and Engagement Activities

Unseen World: Microbes and the Environment – KidsU Summer Camp for Grades 9-12 (2013 - 2014)

Participants become environmental microbiologists for a week. They collect sediment samples from local waterways and conduct analyses such as cultural enrichment, enzymatic characterization, DNA extraction, and PCR amplification. Through this research, students learn about the microbial community of the Tennessee River.

Virtual Biology: Using Computers to Discover New Medicines – KidsU Summer Camp for Grades 9-12 (2013 - 2014)

Participants learn the basics of biophysics through protein structure by building physical and virtual protein models. The students predict the structure and function of proteins through simulation software and conduct virtual biochemical experiments to find targets for potential pharmaceuticals. They learn how computational biology is used for virtual drug discovery and virtual toxicology.

Hands-On: Real World Lessons for Middle School Classrooms (Food Safety and Healthier Living) – Science Curriculum Coordinator (2004-2006)

Worked as part of an interdisciplinary team to create integrated science units for middle school curriculum designed to promote best practices in inquiry-based learning and better food handling practices in at risk populations. Trained middle school teachers to use the curriculum and to understand the theory behind the development. As of 2014, the curriculum has been used by over 34,000 students in 148 middle schools across 11 states.

Hands-On: Public Transportation Science – Science Curriculum Coordinator (2013-2014)

Led an interdisciplinary team in developing inquiry-based curriculum to promote best teaching practices in middle school class rooms and expand student awareness of careers in the fields of public transit and civil engineering.

Grant Awards

Phase I STTR Award 2006, NSF Biotechnology Program, Identification of commercially viable insect resistance traits for transgenic crops, PI: **H. Richards**, $150,000

National Integrated Food Safety Initiative Award 2005, USDA CREES Program, Implementing a Dynamic Food Safety Curriculum Targeted at Middle School Students, Co-PI's: F.A. Draughon, J. Richards, G. Skolits, **H. Richards**, J. Burney, and P. King, $583,750

Proposal Development and Writing Teams

Integrated Research and Training for Data-Enabled Materials Design through Synthesis, Modeling and Neutrons (SyMoNe), NSF Research Training grant (2014)

- Developed and wrote a training program for next generation scientists of the Materials Genome Initiative and was senior personnel tasked with grad student mentoring and project coordination

Data Analytics and Computational Experience supporting Energy Science and Engineering (DAnCE for ESE), NSF Research Training grant (2014)

- Developed and wrote a training program for a new model of data science training in energy related fields and was senior personnel tasked with grad student mentoring and project coordination

Graduate Advance Placement System (GAPS), NSF LSAMP Broadening Participation Research grant (2012)

- Co-developed a mentoring program to facilitate transition of underrepresented minorities to graduate school and was the primary proposal author and a Co-PI

SCALE-IT 20/20, NSF IGERT graduate training program (2012)

- Developed and wrote a training program for interdisciplinary computational biologists

Customized Energy and Renewable Carbon through Lignocellulosic Engineering (CERCLE), NSF IGERT graduate training program (2011)

- Developed and wrote a training program for interdisciplinary energy scientists

Invited Presentations

Controlling the Narrative: Secrets of the Graduate School Application Process

An interactive "chalk talk" experience designed to share with undergrads and Masters students the realities of the graduate application process and how to maximize the value of a personal application not just to graduate programs, but for jobs in general

Biology Department – William and Mary University (2013)
Food Science and Technology Department – University of Tennessee (2012, 2013)
Center for Bioinformatics and Computational Biology – Jackson State University (2012)
Biology and Chemistry Department – Savannah State University (2011)

Research Publications

Bhaduri, S, I Wesley, **HA Richards**, FA Draughon, and M Wallace (2009), Clonality and Antibiotic Susceptibility of *Yersinia enterocolitica* Isolated from US Market Weight Hogs, Foodorne Pathogens and Disease 6(3): 351-356

Doane, CA, P Pangloli, **HA Richards**, JR Mount, DA Golden, and FA Draughon (2007), Occurrence of *Escherichia coli* O157:H7 in diverse farm environments, Journal of Food Protection 70: 6-10

Richards, J, G Skolits, **HA Richards,** FA Draughon (2006) "Snapshots of Science in Practice: The Science of Salmonella." *Educational Leadership*, vol. 64 (4), December 2006/January 2007.

Richards, HA, D Perez-Conesa, CA Doane, BE Gillespie, JR Mount, SP Oliver, P Pangloli, and FA Draughon (2006), Genetic characterization of a diverse *Escherichia coli* O157:H7 population from a variety of farm environments, Foodborne Pathogens and Disease 3: 259-265

Rodriguez, A, P Pangloli, **HA Richards**, JR Mount, and FA Draughon (2006), Prevalence of *Salmonella* in diverse environmental farm samples, Journal of Food Protection 69: 2576-2580

Pangloli, P, F Jackson, **HA Richards**, JR Mount, and FA Draughon (2006), Comparion of conventional plating and SimPlate methods for enumeration of aerobic microorganisms, coliform and *Escherichia coli* in farm environmental samples, Journal for Rapid Methodology and Automation in Microbiology 14: 258-265

Richards, HA, C Han, RG Hopkins, MA Failla, WW Ward, and CN Stewart Jr. (2003), Food safety evaluation of recombinantly produced green fluorescent protein, Journal of Nutrition 133: 1909-1912

Richards, HA, MD Halfhill, RJ Millwood, and CN Stewart Jr. (2003), GFP fluorescence as an indicator of recombinant protein expression in transgenic plants, Plant Cell Reports 22: 117-121

Halfhill, MD, **HA Richards**, SA Mabon, and CN Stewart Jr. (2001), Expression of GFP and Bt transgenes in *B. napus* and hybridization with *B. rapa*, Theoretical and Applied Genetics 103: 659-667

Richards, HA, VA Rudas, H Sun, JK McDaniel, Z Thomaszewski, and BV Conger (2001), Construction of a GFP-BAR plasmid and its use for switchgrass transformation, Plant Cell Reports 20: 48-54

Harper, BK, SA Mabon, SM Leffel, MD Halfhill, **HA Richards**, KA Moyer, and CN Stewart Jr. (1999), Green fluorescent protein as a marker for expression of a second transgene in transgenic plants, Nature Biotechnology 17: 1125-1129

Review Articles and Book Chapters

Richards, HA, LC Hudson, MD Halfhill, and CN Stewart, Jr. (2004), Genetically Modified Plant Controversies: Sensational Headlines verses Sensible Research, In: Plant Development and Biotechnology, RN Trigiano and DJ Gray (eds), pp 251-263. CRC Press, Boca Raton, FL

Richards, HA and S Hefle (2003), Plant biotechnology and food safety evaluation, In: Transgenic Plants: Current Innovations and Future Trends, C.N. Stewart Jr. (ed), pp 217-232. Horizon Press, Norfolk, England

Stewart, CN Jr., MD Halfhill, and **HA Richards** (2000), Transgenic plants and biosafety: Science, misconceptions, and public perceptions, Biotechniques 29: 832-834

Mentored Projects – Scalable Computing and Leading Edge Innovative Technologies (SCALE-IT) Innovation in Research and Education Awards

SCALE-IT students denoted by *

1. Development and Implementation of the Statistical Analysis of Aromatic Rings (STAAR) Software Package to Study the Impact of Anion-Quadrupole Interactions between Proteins and Ligands. (2010, 2011, 2012, 2013)

   > *Jenkins, D. D., *Harris, J. B., Howell, E. E., Hinde, R. J., & Baudry, J. (2012). STAAR: Statistical analysis of aromatic rings. Journal of Computational Chemistry, 34, 6, 518-522.

   > *Harris J.B. (2011, May). Using High-Performance Supercomputing to Find Endocrine Disruptors: A Fast Track to Discovering New Medicines and Protecting the Environment. Poster presented at the NSF-IGERT 2011 Poster Competition. Online

   > *Harris, J.B., *Jenkins, D.D., *Reyles, J., *Rickett, S., *Utley, J.M., Howell, E.E., Baurdy, J., & Hinde, R.J. (2011, April). Determining Anion-Quadrupole Interactions Among Protein, DNA, and Ligand Molecules. Poster session presented at the annual UT-ORNL-KBRIN Bioinformatics Summit, Memphis, TN.

   > *Harris J. B., Philip V., *Adams, R. M., Nguyen, D., Spiers, J., Baudry, J., Howell E. E., Hinde R. J. (2010, July). A PDB search for the anion-quadrupole interaction. Poster presented at the UT/ORNL Summer School in Biophysics. Knoxville, TN.

   > Philip, V., *Harris, J., *Adams, R., Nguyen, D., Spiers, J., Baudry, J., Howell, E. E., & Hinde, R. J. (2011). A Survey of Aspartate-Phenylalanine and Glutamate-Phenylalanine Interactions in the Protein Data Bank: Searching for Anion-p Pairs. Biochemistry. 50, 2939-2950.

   > **STatistical Analysis of Aromatic Ring Structures (STAARS):** Software designed to search the entirety of the NCBI Protein Database for protein structural information that reveals the importance of ion-aromatic ring interactions in protein conformation. The software is intended to improve predictive modeling of protein-protein interactions.

2. MAPN - Microbial Activity Prediction Network: Using Artificial Neural Network Software to Identify Metabolic Processes in Large-scale Metagenomic Data (2013)

   > *Higgins, S.A., Welsh, A., Sanford, R.A., Chee-Sanford, J., Konstantinidis, K., Ritalahti, K., & Löffler, F.E. (2014, Feb). Cultivation and PCR-based Approaches Elucidate the Functional Diversity of Soil Fungal Populations Contributing to Nitrogen Cycling in Soils. Poster session at Department of Energy Genomic Science Contractors-Grantees Meeting, Washington, D.C.

Microbial Activity Prediction Network (MAPN): Software designed to identify genes related to metabolic pathways in metagenomic data. The software is intended to automate the process of reconstructing the active metabolic potential of a microbial community.

3. A Monogamous Mind: How Pair-Bonding in Early Humans Facilitated the Evolution of Human Intelligence (2013)

   Kelly Rooker – 2013 NSF Graduate Research Fellowship Award and 2014 NSA Operations Research, Modeling, and Simulation Group Summer Intership

4. Feature Detection in Chemometric Data: Applications of Deep Machine Learning and Data Mining in Computational Life Sciences (2013)

   *Koessler, D. (2013, Dec) Using Large-Scale Matrix Factorizations to identify users of Social Networks, Poster and Oral Presentation at the 6th International Conference of the ERCIM on Computational and Methodological Statistics, University of London, UK

   *Koessler, D. (2013, Oct) Social Fingerprinting: An Application of Ranking Functions and Machine Learning in Mobile Phone Data, Poster at the Grace Hopper Celebration of Women in Computing National Conference, Minneapolis, MN.

   *Goodrich, B., *Koessler, D., *Rempe, C., *Woo, H., & Adams, M. (2013, Nov) Feature detection of peak data: applications of deep machine learning and data mining in computational life sciences. Poster session at Southeast Women in Computing Conference, Lake Guntersville State Park, AL.

   Hanna Woo – 2013 NSF Graduate Research Fellowship Award

5. Development of Automated Needle Measurements Software in Support of Physiological Research (2013)

   McKinney, A.C., *Hughes. M.J., & Kaylor, M.D. (2014, Apr) Can We Visually Inspect the Needles of Fraser Fir to Estimate an Indicator of Shoot Health? Poster Session presented at: 75th Annual Meeting of the Association of Southeastern Biologists. Spartanburg, SC.

   Worley, S.D., Kaylor, S.D., & *Hughes, M.J. (2014, Apr) Stressed Fraser Fir Trees Prioritize Photosynthetic Capacity Over Other Functions. Poster Session presented at: 75th Annual Meeting of the Association of Southeastern Biologists. Spartanburg, SC.

   Measurements in Images of Many Small Items (MIMSI): A MATLAB user interface to segment scans and images of many small items for clustering to measure area, perimeter, length, and width

6. Programming for Statistical and Graphical Analysis of Biological Data (LS507): A Course Designed to Teach Basic Scripting Skills for Bioinformatics Data Analysis (2011, 2012, 2013)

> *Rempe, C., Jia, Q., *Adams, R., & *Storey, D. (2013, Nov) Interdisciplinary education for graduate students: introducing biologists to computer programming. Poster session at the Southeast Women in Computing Conference, Lake Guntersville State Park, AL.

> **Required Course** – Genome Science and Technology Graduate Program at UT

7. Effects of Tree Health on Fire Risk Prediction in Canadian Boreal Forests (2012)

> **Tyler Massaro** – 2013 NSF East Asian and Pacific Science Initiative Research Fellowship Award with this project as the basis for the proposed research

8. Machine Learning and Automated Cloud Detection in Satellite Images (2012)

> *Hughes, M. J., & Hayes, D. J. (2013, Dec). Automated Detection and Annotation of Disturbance in Eastern Forests. Oral presentation In session: Ecological Disturbance: observing and predicting the impacts of landscape disturbance. 2013 AGU Fall Meeting, San Francisco, CA.

> *Hughes, M. J., & Hayes, D. J. (2013 Aug). Disturbance Type identification in eastern forests. Oral presentation at Ecological Society of America Annual Meeting, Minneapolis, MN.

> *Hughes, M.J., *Mishtal, A.J., *Goodrich, B.F., & Hayes, D.J. (2013, April). A Deep-learning Approach to Cloud Detection with an Application to Forest Change Near Protected Areas. US International Association of Landscape Ecologists Annual Meeting 2013, Austin TX. (Talk)

> **Spatial Procedures for Automated Removal of Cloud and Shadow (SPARCS):** Software designed to generate continuous-valued certainty masks of clouds, cloud shadow, water, and other formations from the Landsat Archive

> **Vegetation Regeneration and Disturbance Estimates through Time (VeRDET):** Algorithm developed to identify the spatial extents, start dates, and stop dates of discrete forest change events

9. Gene Network Detection via Graph Theory: Dissecting Molecular Mechanisms for the Infection in the *Phytophthora capsici* by the *Solanum lycopersicum* (Tomato) Patho-system (2012)

> *Storey, D., and Lamour, K. (2013, April). Global Diversity of Effectors in Phytophthora capsici, Oomycete Molecular Genetics Network National Meeting, Asilomar, California

Dylan Storey – <u>2012 USDA Graduate Fellowship Award</u>

10. Development and Implementation of a Nested-Lattices Model to Evaluate the Impact of Cross-Scale Species Interaction (2011, 2012)

*Dumoulin, C., *Milt, A.W., Armsworth, P.R. (2012 Aug). Modeling Spatial Information Transfer Across Trophic Levels. The Ecological Society of America's Annual Conference, Portland, OR.

*Dumoulin, C., *Milt, A., & Armsworth, P.R. (2012, March). Tracking information across trophic levels. Poster session presented at the UT-ORNL-KBRIN Bioinformatics summit, Louisville, KY.

Research Experience for Undergraduate in Multi-scale Environmental Monitoring: Competitively selected undergraduate participated in an REU development and supervised by SCALE-IT students and supervised by me.

Austin Milt – <u>2013 and 2014 National Institute of Mathematics and Biological Synthesis (NIMBioS) Graduate Fellowship Award</u>

Christine Dumoulin – <u>2014 National Institute of Mathematics and Biological Synthesis (NIMBioS) Graduate Fellowship Award</u>

11. SpecMaster: Using GPU Processing Power to Identify Post Translational Modification of Peptides In Mass Spectrometry Sequencing (2011)

*Weber, R., *Jenkins, D. D., Lineback, N., & Peterson, G. D. (2012, June). Accelerating Tandom MS Protein Database Searching Using OpenCL. International Emerging Computational Methods for the Life Sciences Workshop in conjuction with the ACM International Symposium on High Performance and Distributed Computing. Delft, Netherlands. Winner "Best Student Presentation Award"

*Weber, R., Peterson, G.D., & Hettich, R. (2012, July). For Three Easy Payments: Scoring Peptides with Portable Performance using Specmaster, Symposium on Application Accelerators in High Performance Computing, Urban, Illinois

Du, P., *Weber, R., Luszczek, P., Tomov, S., Peterson, G. and Dongarra, J. (2011) From CUDA to OpenCL: Towards a Performance-portable Solution for Multi-platform GPU Programming, Journal of Parallel Computing. 10/11 Special Issue. http://www.citeulike.org/article/10444921

*Weber, R., Erickson, B., *Adams, R., *Ellingson, S., *Storey, D., **Richards, H.** & Hettich, R. L. (2011, June). Software profiling of database search engines results in memory and GPU acceleration. Poster session presented at the annual

American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Denver, CO.

*Weber. R., Gothandaraman, A., Hinde, R. J., Peterson, G. D. (2011) Comparing Hardware Accelerators in Scientific Computing: A Case Study. IEEE Transactions on Parallel and Distributed Systens. 22(1), 58-68.

*Weber, R., *Jenkins, D.D., *Lineback, N., Peterson, G., (2012, June), Accelerating Tandem MS Protein Database Searches Using OpenCL, International Emerging Computational Methods for the Life Sciences Workshop at High-Performance Parallel and Distributed Computing, Delft, the Netherlands.

Specmaster: Software designed to enable high performance and parallel computing applications of peptide sequencing. The software is intended to enable sequencing of post-translationally modified peptides that complicates mass spectrometry-based methods of identification.

12. TORPEDO (Tools and Omnibus Repository for Proteomic Experimental Datasets Online): A Software Package Designed to Facilitate High-Throughput Proteomic Data Analysis (2010, 2011)

Abraham P., *Adams R., Giannone R.J., Kalluri U., Ranjan P., Erickson B., Shah M., Tuskan G.A., & Hettich R.L. (2012). Defining the boundaries and characterizing the landscape of genome expression in vascular tissues of Populus using shotgun proteomic characterization. Journal of Proteome Research, 11(1), 449-60.

*Adams R., Giannone R.J., Abraham P., Tuskan, G., Pan, C. & Hettich R.L. (2011, June). Clustering by homology increases confidence in protein identifications and quantification in Populus proteomics. Poster session presented at the annual American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Denver, CO.

*Ellingson, S., *Hughes, M. J., *Storey, D., *Weber, R., and Verberkmoes, N. (2010, March). Probabilistic Quality Classification of MSMS Spectra. Poster session presented at the 2010 UT-ORNL-KBRIN Bioinformatics Summit, Lake Barkley, KY.

Erickson, B., *Adams, R., *Ellingson, S., *Storey, D., *Weber, R., **Richards, H.** & Hettich, R. L. (2011, June). Proteome Informatics Suite for Mass Spectrometry (PRISMS): A cloud-like server for storing, organizing and mining high complexity proteomic datasets. Poster session presented at the annual American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Denver, CO.

*Storey, D., Erickson, B., *Adams, R., *Ellingson, S., *Weber, R., **Richards, H.** & Hettich, R. L. (2011, June). Mining millions of assigned peptides in order to identify characteristics of incomplete protein sequence coverage. Poster session

presented at the annual American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Denver, CO.

Tools and Omnibus: Repository for Proteomic and Experimental Datasets Online (TORPEDO): Software package designed to streamline the collection and analysis of peptide sequencing data from mass spectrometry. The software is intended to facilitate high-throughput comparative proteomics.

13. Survey of Biology for Computational Scientists (LS595): A Course Designed to Introduce Computational Science Majors to Computation Biology Research. (2011, 2012)

*Koessler, D., *Adams, R., *Johnson, E. (2011, October). Building better interdisciplinary scientists: Creating graduate level courses to address the communication gap in interdisciplinary research. Poster session presented at the Tennessee Women in Computing Conference, Fall Creek Falls, TN.

*Koessler, D., *Utley, J., *Johnson, E., **Richards, H.**, and Peterson, C. (2012, March) Graduate Level Courses to Address the Communication Gap in Interdisciplinary Research. Poster session presented at the annual meeting of UT-ORNL-KBRIN Bioinformatics Summit, Louisville, KY.

Rachel Fovargue – 2013 NSF Graduate Research Fellowship Award

Denise Koessler – 2013 Outstanding Teaching Assistant Award for the Department of Electrical Engineering and Computer Science

14. Interdisciplinary Research in Computer Science: Activities for the Grace Hopper Women in Computing Conference (2011)

*Koessler, D. (2014, Feb) Power of Peers and Systers at UTK, Invited Talk at the Alliance of Women Philanthropists Annual Giving Circle, Knoxville, TN.

*Koessler, D. (2013, Nov) Power of Peers, Invited guest speaker to the Southeastern Women in Computing Conference, Fall Creek Falls, AL

*Ellingson, S.R. (2011, October). Running Parallel Tracks: Family and Grad School. At Tennessee Celebration of Women in Computing, Pikeville, TN.

*Ellingson, Sally, *Koessler, Denise, *Adams, Rachel, *Rempe, Caroline. (2011, October) Tennessee Women in Computing Conference. Birds of a Feather panel-led discussion. "Challenges and Advantages in Interdisciplinary Research" Fall Creek Falls, TN.

*Rempe, Caroline, Keleman, Reka, (2011, October) Tennessee Women in Computing Conference. Social activity leaders of an interdisciplinary research inspired and self-created board game. "Scientific Clue" Fall Creek Falls, TN.

*Rempe, Caroline, Keleman, Reka, (2011, October) Tennessee Women in Computing Conference. Social activity leaders of a computationally inspired group dance. "Programmable Dance" Fall Creek Falls, TN.

Denise Koessler – <u>2014 UT Graduate Torchbearer Award</u> – President of the Systers Women in Computing group and student founder of "Lean In Leader" circles at the UT's Electrical Engineering and Computer Science Department

15. High-Throughput Molecular Docking: Conducting Virtual Biochemistry with High Performance Computing (2010)

*Ellingson, S. R., Smith, J. C., & Baudry, J. (2013). VinaMPI: Facilitating Multiple Receptor High-Throughput Virtual Docking on High Performance Computers, J. Comp. Chem. 34:25, 2212–2221.

*Ellingson, S. R., Dakshanamurthy, S., Brown, M., Smith, J. C., & Baudry, J. (2014). Accelerating virtual high-throughput ligand docking: current technology and case study on a petascale supercomputer, Concurrency Computat.: Pract. Exper. 26, 1268–1277.

*Ellingson, S. R. (2013, Dec). Adventures in Computational Biology. Invited seminar at Markey Cancer Center, University of Kentucky, Lexington, KY.

*Ellingson, S. R. (2013, Nov). Leveraging the Power of the Fastest Supercomputers to Advance Drug Discovery. Oral presentation at University of Tennessee Exhibitor Booth at Supercomputing, Denver, CO.

*Ellingson, S. R. (2013, Nov). Multi-Receptor High-Throughput Virtual Docking on Supercomputers with VinaMPI. Oral presentation in Doctoral Showcase at Supercomputing, Denver, CO.

*Ellingson, S. R., & Baudry, J. (2013, Nov). High-throughput Docking in Undergraduate Curriculum. Poster session at Broader Engagement and HPC Educators Networking event at Supercomputing, Denver, CO.

*Ellingson, S. R., & Baudry, J. (2012, July). High-throughput Virtual Molecular Docking on High-Performance Computers. Poster session at the National Biomedical Computation Resource Summer Institute, La Jolla, CA.

*Ellingson, S. R. (2012, June). Accelerating Virtual High-Throughput Ligand Docking: Screening One Million Compounds Using a Petascale Supercomputer. Emerging Computational Methods in the Life Sciences at HPDC'12, Delft, the Netherlands.

*Ellingson, S. R., Dakshanamurthy, S., Brown, M., Smith, J. C., & Baudry, J. (2012). Accelerating Virtual High-Throughput Ligand Docking: Screening One Million Compounds Using a Petascale Supercomputer. Proceedings of the third international workshop on emerging computational methods for the life sciences, the Netherlands.

*Ellingson, S. R., and Baudry, J. (2012). High-Throughput Virtual Molecular Docking with AutoDockCloud. Concurrency and Computation: Practice and Experience. DOI: 10.1002/cpe.2926

*Ellingson, S.R. and Baudry, J. (2011). High-Throughput Virtual Molecular Docking: Hadoop Implementation of AutoDock4 on a Private Cloud. Proceedings of the second international workshop on Emerging computational methods for the life sciences (ECMLS '11). ACM, New York, NY, USA, 33-38.

*Ellingson, S.R. (2011, Nov). High-Throughput Virtual Molecular Docking within the MapReduce Framework of Hadoop. ACM-SRC poster session at Grace Hopper Celebration, Portland, OR and Communities Resource Fair at Supercomputing, Seattle, WA.

*Ellingson, S.R. and Baudry, J. (2011, June) High-Throughput Virtual Molecular Docking: Hadoop Implementation of AutoDock4 on a Private Cloud. In Emerging Computational Methods in the Life Sciences, workshop conducted at High Performance and Distributed Computing 2011, San Jose, CA.

Sally Ellingson – 2013 American Chemical Society Chemical Computing Group Research Excellence Award for a presentation on this research

16. Goats Love Kudzu: Using Math to Validate Biological Control of an Invasive Species (2010)

*Hughes, M. J., Johnson, E. G., & Armsworth, P. R. (2013). Optimal spatial management of an invasive species with above- and below-ground components. *Biological Invasions*. DOI: 10.1007/s10530-013-0553-5

*Hughes, M.J., *Johnson, E.G, Armsworth, P.R. (2013). Optimal spatial management of an invasive species with above- and below-ground components. Biological Invasions. DOI: 10.1007/s10530-013-0553-5

*Hughes, M.J., *Johnson, E. and Armsworth, P. (2011, August). "Near-optimal temporal and spatial control strategies for kudzu using goats". Poster session at Ecological Society of America Annual Meeting, Austin TX.

*Hughes, M.J., *Johnson, E.G, and Armsworth, P. A. (2011, April). Goats love Kudzu: Near-optimal grazer deployment under a two-compartment growth model of an invasive weed. Poster session presented at the 10th Annual UT-ORNL-KBRIN Bioinformatics Summit, Memphis, TN.

References

Cynthia Peterson – Dean of the College of Sciences, Louisiana State University
Email: cbpeterson@lsu.edu
Phone: 225-223-4025
Relationship: SCALE-IT Supervisor

Albrecht Von Armin – Professor and Director of Genome Science and Technology Program, University of Tennessee
Email: vonarnim@utk.edu
Phone: 865-974-6206
Relationship: Collaborator

Dylan Storey – Research Associate and Bioinformatics Lab Director, University of California, Davis
Email: Dylan.storey@gmail.com
Phone: 714-425-0620
Relationship: Former student

Denise Koessler – Data Scientist for PokitDok, LLC., Charleston, SC
Email: denise.koessler@gmail.com
Phone: 865-406-6449
Relationship: Former Student and Co-Instructor

Ernest Brothers – Associate Dean of Graduate Teaching and Mentoring, University of Tennessee
Email: ebrother@utk.edu
Phone: 865-974-3634
Relationship: Collaborator

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