



2011   
Compendium

The Interdisciplinary Research Symposium

November 4th 2011

At the Graduate Life Center

Organized by: the Interdisciplinary  
Research Honor Society

## A letter from the Organizers

Dear Attendees,

Welcome to Iota Delta Rho's first Interdisciplinary Research (IDR) Symposium at Virginia Tech!

This IDR Symposium is organized by the Interdisciplinary Research Honor Society, Iota Delta Rho (IDP) - the nation's *first* interdisciplinary research honor society! IDP was established with the objective of recognizing and promoting interdisciplinary research both at Virginia Tech and beyond. It was started in the Spring semester of 2011 by an active group of graduate students, who hope that IDP will continue to grow in the years to come and that one day, in the near future, IDP chapters will exist in all universities across the nation, and possibly around the world.

IDP stands for promoting IDR research and believes that it is very important for interdisciplinary researchers to have the opportunity to interact with peers from other disciplines; hence, bridging the divide between them. IDP hopes that this symposium can serve as a vehicle for promoting interdisciplinary collaboration among Virginia Tech's students and faculty aiming specifically to increase the awareness of interdisciplinary research, facilitate communication between researchers from different disciplines, recognize IDR researchers and their accomplishments, and ultimately, help increase the number of IDR endeavors at Virginia Tech.

IDP envisions this symposium as a celebration of the interdisciplinary endeavors that are pursued continuously in all programs, colleges and institutions of Virginia Tech. Virginia Tech is on a quest to Invent the Future, and has realized that the future of the twenty-first century is inevitably interdisciplinary. This realization is evident in the fascinating work that is constantly being demonstrated by the research of the students and faculty of this great Institution. IDP's first Interdisciplinary Research Symposium depicts only some of Virginia Tech's extensive and outstanding interdisciplinary endeavors.

IDP's celebration of interdisciplinarity, the first Interdisciplinary Research (IDR) Symposium at Virginia Tech, has been organized into several distinct, yet integrated, sections. Today, you will hear distinguished researchers sharing their valuable experiences of the benefits and challenges of their unique IDR encounters, observe poster presentations demonstrating the fascinating research that is being done by undergraduate and graduate students across this university, and participate in a workshop to guide you in the first steps of an interdisciplinary research career. We hope that you will appreciate this unique opportunity to experience marvelous interactions with researchers from diverse disciplines at our beloved institute, Virginia Tech.

We greatly value your participation in Iota Delta Rho's first Interdisciplinary Research Symposium, and we applaud you on your interdisciplinary research efforts. We are pleased that this first-time event will showcase our university's IDR endeavors and bring together some of the most accomplished minds in academic interdisciplinary research. We hope that you will enjoy learning from them and from each other.

With gratitude,

Iota Delta Rho  
Interdisciplinary Research Honor Society (IDP)

# 1st Interdisciplinary Research Symposium

## November 4th 2011, Blacksburg, VA, USA

### Symposium Program Overview

Start	End	Schedule
8:30	9:00	Registration
9:00	9:15	Opening Remarks
9:15	10:55	<b>Speaker Session 1</b>
10:55	11:15	Coffee Break
11:15	12:50	<b>Speaker Session 2</b>
12:50	2:30	Lunch Reception / Poster Session*
2:30	4:00	<b>Workshop: “A First Step Towards a Career in Interdisciplinary Research”</b>
4:00	4:15	Award Ceremony
4:15	4:30	<b>Closing Remarks</b>

\* Posters must be up for presentation from 10:45 till 3:00 pm. Posters shall be removed by 4:45 pm. Stands will be provided. Presenters will be judged from 12:30 – 3:00 pm and should be present during this time personally or represented by a proxy.

### Speaker Session Overview

Title	Speaker	Time
LISA On-the-ground Statisticians in Mozambique: a new paradigm for interdisciplinary collaboration	<b>Dr. Eric Vance</b> Statistics	9:15 – 9:40
An interdisciplinary Approach in Architecture/Engineering/Construction & Facilities Management Industry	<b>Dr. Mani Golparvar-Fard</b> Civil and Environmental Engineering	9:40 – 10:05
My Trials and Tribulations of Inter- and Multidisciplinary Research at VT	<b>Dr. Nammalwar Sriranganathan</b> Biomedical Sciences and Pathobiology	10:05 -10:30
The need for interdisciplinary collaboration in mind-body practices research: understanding the effects of meditation, yoga, taiji, and qigong	<b>Dr. Matthew Komelski</b> Human Development	10:30 – 10:55
Interdisciplinary Science and the Pink Galoshes	<b>Dr. Kathleen A. Alexander</b> Fisheries and Wildlife Conservation	11:15 – 11:40
Against Interdisciplinarity as a Panacea	<b>Dr. Francois Debrix</b> Political Science (ASPECT)	11:40 – 12:05
Interdisciplinary Research	<b>Dr. John Little</b> Civil and Environmental Engineering	12:05 – 12:50

## Abstracts: Speaker Sessions

### LISA On-the-ground Statisticians in Mozambique: a new paradigm for statistical collaboration

Eric Vance, PhD

#### Abstract:

LISA (Virginia Tech's Laboratory for Interdisciplinary Statistical Analysis) is dedicated to improving research by delivering high quality statistical support for interdisciplinary collaborations. One such interdisciplinary research project was to evaluate the impacts of the Millennium Challenge Corporation's (MCC) rural water project in Mozambique. The MCC is a U.S. government aid organization funding investments to aid economic development in northern Mozambique, including the drilling and installation of 600 hand pumps in rural villages that currently lack basic access to clean water. This summer, two LISA statisticians traveled with the principal investigator on this project, Dr. Ralph Hall from the College of Ar-

chitecture and Urban Studies, to Mozambique to test whether statisticians in the field do add value to research projects. These "on-the-ground" statisticians successfully contributed statistical expertise to improve all aspects of this baseline study, starting with the study design, through the data collection and data preparation phases, to the current stage of statistical analysis. We intend for this experience to serve as a model for how having a data expert in the field to make statistical decisions can add tremendous value to interdisciplinary research projects.



#### Biography:

Eric Vance was a triple major in mathematics, economics, and statistics at the University of California, Berkeley, and then eleven years later received his PhD in Statistical Science from Duke University. In between his undergraduate and graduate studies, Dr. Vance traveled around the world three times, backpacking through 67 countries in Europe; South and Southeast Asia; Australia and New Zealand; North, Central, and South America; and Africa. Now, as director of LISA (Virginia Tech's Laboratory for Interdisciplinary Statistical Analysis), he is working on projects that will enable his students the opportunity to travel internationally.

# An interdisciplinary Approach to Automated Performance Monitoring in the Architecture/ Engineering/ Construction & Facilities Management Industry

Mani Golparvar-Fard, PhD

## Abstract:

Early detection of performance deviations in Architecture/Engineering/Construction and Facility Management (AEC/FM) activities is critical to project management as it provides an opportunity to initiate proactive actions to minimize their impacts. Despite the importance, current monitoring practice includes manual data collection, non-systematic reporting, and visually complex representations. This talk addresses these challenges by introducing an interdisciplinary research approach to generation of D4AR – 4D augmented reality – models for automating and visualizing monitoring of sustainable built environments. These models assembled through superimposition of 4D (3D + time) point clouds generated from unordered photo collections and 4D Building Information Models, automatically visualize performance deviations and allow practitioners to intuitively observe problems, conduct various decision-

making tasks, and minimize detrimental impacts of performance deviations in an augmented-reality environment rather than the real world which is time-consuming and costly. These models generate a new research paradigm by allowing researchers develop visual sensing techniques to automatically track productivity, safety, quality, and carbon footprint of operations. To this extent, the benefits and challenges of initiating and conducting this interdisciplinary project which integrates construction engineering and management, with computer graphics, computer vision, and machine learning are discussed in detail. A set of recommendations and a roadmap for conducting future studies in this area, and creating cyber-physical systems for automation in the AEC/FM industry are presented.

## Biography:

Dr. Mani Golparvar-Fard is an Assistant Professor in the Via Department of Civil and Environmental Engineering as well as Myers-Lawson School of Construction. He is the founder and director of the Real-time and Automated Monitoring and Control (RAAMAC) Lab. The RAAMAC lab is a unique interdisciplinary facility that focuses on creating technologies to improve construction performance and minimize carbon footprint. The current research focuses on real-time tracking of construction equipment and personnel, automated 3D as-built modeling and visualization for energy analysis of existing building, and remote assessment of post-disaster critical physical infrastructure.

Dr. Golparvar-Fard is also the founder and the CEO of the Vision Construction Monitoring, LLC startup company which facilitates transition of research to practice and provides interdisciplinary solutions for addressing performance monitoring in the AEC/FM industry.





# My Trials and Tribulations of Inter- and Multidisciplinary Research at VT

Nammalwar Sriranganathan, PhD

## Abstract:

I would like to share our experiences in two projects, one called “Bioremediation of Regulated Medical Waste”, which was a Industry initiated Biological and Engineering effort. Plans were to develop a process (Biological and Engineering) that could kill 6 Log (99.9999%) of bacteria, 4 Log (99.99%) of spores, viruses and Parasites. The first meeting was an eye opener for me and I understood only about 10% of the conversation. Engineering development was to have a grinding equipment to process 3 to 4 inch thick steel bone inserts and fermentation type of vessel to handle regulated hospital waste. Initially biological requirements were not even in the equation.

Then once we demonstrated the need for temperature, pH and time needed to accomplish what was needed a truly efficient process was developed. I will share the lessons we learned about keeping an eye on the objectives of the process which really helped us biologists to see the focus of the engineers. The second experience is with my current development of targeted drug delivery. In this regard I would like to share difficulties in understanding different languages of chemists, engineers, material science experts and biologists, experimental vs. application biologists.



## Biography:

Dr. Nammalwar Sriranganathan is a professor of bacteriology in the Department of Biomedical Sciences and Pathobiology in the Virginia-Maryland Regional College of Veterinary Medicine at Virginia Tech. He received his B.V.Sc. in 1966 and his M.V.Sc. in 1968 from the University of Agriculture Sciences in Bangalore, India. In 1974, he earned his Ph.D. in molecular biology from Oregon State University. Sriranganathan's primary research interests include: Development of vaccines against agents of bioterrorism. Development of multivalent vaccines against neosporosis, anthrax, tuberculosis etc, using our current USDA approved Brucella abortus RB51 cattle vaccine as the platform. Targeted drug delivery against intracellular pathogens like drug resistant Salmonella, Brucella and Mycobacterium. Phage mediated bioremediation of food borne Salmonella in poultry, and the effect of aging on immune response. His efforts in biomedical research have been published in numerous articles.

# The need for interdisciplinary collaboration in mind-body practices research: understanding the effects of meditation, yoga, taiji, and qigong

Matthew F. Komelski, PhD

## Abstract:

Integrative (mind-body) practices, such as meditation, yoga, qigong are contemporary disciplines with ancient roots. For centuries these practices have aimed to promote wellbeing and support healthy longevity across cultures and environments that sometimes challenged such goals. This talk will explore a) the potential benefits of integrative practices for modern practitioners and societies, b) the need for interdisciplinary teams to understand how these practices create change, and c) some current challenges to interdisciplinary research in this area.

## Biography:

Dr. Matthew F. Komelski is an instructor in Virginia Tech's Department of Human Development. He has been involved in integrative (mind-body) practices since childhood and has made them a topic of his scholarship throughout his educational and academic career, including formal and independent studies on meditation, Taiji, and qigong at the University of Hawaii at Manoa and Kansai and Konan Universities in Japan. After completing B.A.s in philosophy, religion, and history, from Radford University and an M.A. in Asian Studies from University of Hawaii, he changed his major academic focus from cultural and ethnographic studies to developmental science when he entered Virginia Tech's PhD program in Human Development. In May of 2010 he earned his Doctoral Degree in Human Development along with a Certificate in Gerontology. Through his research he seeks to document the complexity of integrative practice regimens, their mechanisms of effect, and the effect of differential practice regimens on general and specific health outcomes. Through his outreach efforts

he seeks to open dialogs and create understanding between practitioners, scientists, and the general public about integrative approaches to health and wellbeing.



# Interdisciplinary Science and the Pink Goulashes

Kathleen A. Alexander, PhD, DVM

## Abstract:

The world is besieged with difficult and complex problems that challenge our historical way of doing scientific business – and business it is. There are continuous calls for transformation in our scientific approach with the expectation that true sector integration and information synthesis will stimulate novel interventions and ideas. The importance of this approach is clear and we are making progress. But where are you on the scale? Are you hand waving? Are you simply wearing pink goulashes, appearing to be different or are you truly integrating the different perspective implied?



## Biography:

Dr. Kathleen Alexander has been conducting research in East and Southern Africa for over twenty years. She has worked for the Government of Botswana as both the Chief of the Wildlife Veterinary Unit in the Department of Wildlife and National Parks and later, as the Ecological Advisor to the Office of the President of Botswana and the Attorney Generals Chambers. She is a member of both the World Conservation Union's Wildlife Health Specialist Group and the Commission for Ecosystem Management. She moved to the Department of Fish and Wildlife Conservation at Virginia Tech in 2007 where she continues to conduct research in her long-term Botswana study site on the dynamics of emerging infectious disease at the human-animal interface, human-wildlife conflict, and community livelihoods and development. Kathleen received both her PhD and veterinary degree from University of California, Davis.



# Against Interdisciplinarity as a Panacea

François Debrix, PhD

## Abstract:

This presentation offers a reflection on the state of interdisciplinary research today, with particular emphasis on the recent trend among scholars of all stripes to embark upon interdisciplinary or integrative research without necessarily being aware of the analytical stakes involved in such a form of research. In this presentation, I offer both words of caution about the usage of interdisciplinarity in research and words of hope about why and how interdisciplinary work can be performed.

## Biography:

François Debrix, a bilingual scholar whose research focuses on critical world order studies and the theory of transnational politics, has been named director of the Alliance for Social, Political, Ethical, and Cultural Thought (ASPECT), an interdisciplinary Ph.D. and certificate program in the College of Liberal Arts and Human Sciences at Virginia Tech. Debrix is formerly the associate chair of the Department of Politics and International Relations at Florida International University, where he also directed an international lecture series. His research concentrates on contemporary political and social theory; critical and popular geopolitics; postmodern theory and culture; and the media and international relations. Debrix has authored three books and is the editor of “Language, Agency, and Politics in a Constructed World” (M.E. Sharpe, 2003) and the co-editor of “Rituals of Mediation: International Politics and Social Meaning”, as well as “The Geopolitics of American Insecurity: Terror, Power, and Foreign Policy”. Debrix has published more than 20 peer-reviewed journal articles and refereed long review essays in interdisciplinary theory journals across the social sciences and humanities such as *Millennium*, *Philosophy & Social Criticism*, *Third World Quarterly*, *Alternatives*, *Geopolitics*, *New Political Science*, *Peace and Change*, *Études Internationales*, *Telos*, *Postmodern Culture*, and In-

ternational Political Sociology, among others. Debrix received his Ph.D. and a master’s degree from Purdue University and holds two bachelor’s degrees: one in English and Spanish literatures from the University of Haute Normandie, France; the other in International Relations and Diplomatic History from the Institute of Political Science in Strasbourg, France.



# Interdisciplinary Research

John Little, PhD

## Abstract:

The first part of the presentation provides a brief introduction to Interdisciplinary Research, followed by some ideas on managing interdisciplinary research projects (budgets, meetings, and most importantly, people). The second part of the presentation focuses on an NSF IGERT Project titled “EIGER – Exploring Interfaces through Graduate Education and Research.” Dr. Little played a central role in developing the overall EIGER concept and served as Director for about half the project. In addition to technical research on natural interfaces, social science research was applied to the education, training, and research components of the program. EIGER psychologists and experts in education studied the entire operation identifying which approaches were most effective, and what steps were necessary to overcome cultural and institutional barriers. This knowledge was

incorporated in the core classes (“Interdisciplinary Research in Science and Engineering” and “Leadership and Team Processes”) thereby creating a positive feedback loop that enhanced the rate at which we accumulated expertise in interdisciplinary research and education. The presentation concludes with a vision for an Interdisciplinary Incubator that builds upon the new model for Interdisciplinary Research and Education that emerged during the EIGER Project. By improving the effectiveness of interdisciplinary teams, overcoming complex institutional barriers, and disseminating these practices broadly, interdisciplinary research can be made more effective, thereby speeding the solution of the world’s most pressing interdisciplinary problems.

## Biography:

Dr. John Little is a Professor of Civil and Environmental Engineering and serves as Coordinator of

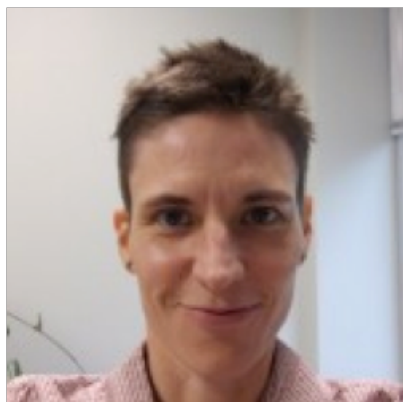


the Environmental and Water Resources Engineering Graduate Program. His general research interests are cross-media mass transfer and process dynamics in environmental systems, although he has focused intensively on two primary topics: migration of contaminants from materials into air and water, and lake and reservoir management. Dr. Little is Chair of the International Society of Indoor Air Quality and Climate (ISIAQ) Scientific and Technical Committee: Sources, Monitoring and Evaluation as well as Chair of the International Water Association (IWA) Specialist Group on Lake and Reservoir Management. He received a National Science Foundation CAREER Award in 1996 and was elected to the ISIAQ Academy of Fellows in 2008. His two most recent PhD students received top research awards in their respective fields. Dr. Lee Bryant received the 2011 Association of Environmental Engineering and Science Professors/CH2M Hill Outstanding Doctoral Dissertation Award while Dr. Ying Xu received the 2011 Yaglou Award for being the “most promising young researcher” from the Academy of Indoor Air Sciences.

## Workshop: “A First Step Towards a Career in Interdisciplinary Research”

In this workshop participants will be exposed to a few topics that they need to consider when writing a proposal for an NSF interdisciplinary research grant. The workshop is divided into three parts. In the first part participants will listen to a brief presentation that highlights a few key aspects about interdisciplinary NSF grants. For the second part, participants will be asked to reflect on the information that was presented to them via application in a hands-on activity. In the final section, participants will have an open discussion with five esteemed panelists that have different perspectives, roles, and experiences.

### Workshop Leader: Cyndy Williams, M.A.



Cyndy Williams served as project associate for the VT Proposal Assistance Group (PAG) from 2007 to 2011. PAG was a small team of editors, reviewers, graphic artists, and research

administrators who assisted PIs in producing grant proposals for funding opportunities in excess of \$2M. In her role on this team, Cyndy was responsible for technical editing, review, and administrative coordination of proposals from both multiple disciplines and to multiple types of funders, although most applications were to federal agencies such as NIH and NSF. Currently, Cyndy works as a pre-award administrator in the Office of Sponsored Programs. In addition to her duties on PAG and in OSP, Cyndy provides grant-writing support to graduate students and new faculty through two courses developed for the Faculty Development Institute. Cyndy received a B.A. in English from Ohio University and an M.A. in Creative Writing from Hollins College. Currently, she is pursuing a Ph.D. in the Rhetoric and Writing Program at VT, with an emphasis on rhetoric in science. Prior to joining PAG and OSP, Cyndy worked as a Medicaid Policy Analyst for the Institute of Policy and Governance at VT and as a grant writer in the non-profit sector.

### Panel Member: James K. Mitchell, PhD



Jim Mitchell received his Bachelor of Civil Engineering degree from Rensselaer Polytechnic Institute in 1951, and Master of Science and Doctor of Science degrees from the Massachusetts In-

stitute of Technology in 1953 and 1956. He was a professor at the University of California, Berkeley, from 1958 until 1993, joined Virginia Tech in 1994 and became University Distinguished Professor, Emeritus in 1999. His research activities concern experimental and analytical studies of soil properties and behavior, admixture stabilization of soils, soil improvement and ground reinforcement, in-situ measurement of soil properties, and mitigation of ground failure risk during earthquakes. Dr. Mitchell is a consultant on geotechnical problems and earthwork projects of many types, including the design of liquefaction mitigation options for several existing dams, ground improvement for a major bridge replacement project, a seismic safety peer review panel for an urban rapid transit system, and land reclamation for development of a new marine terminal. He served as a member of the ASCE External Review Panel for the Performance Evaluation of Hurricane and Flood Protection Projects in S.E. Louisiana following Hurricane Katrina. He is a Distinguished Member of ASCE and was the 2006 winner of the Outstanding Projects and Leaders Award (OPAL) in Education. He is a member of both the United States National Academy of Engineering and the National Academy of Sciences.

**Panel Member: Elizabeth Tranter, M.A.**



Beth Tranter serves as Chief of Staff in the Office of Research with responsibilities for assisting the Vice President with organizing and implementing special initiatives of the

office. She is also responsible for the limited submissions proposal process, and ensuring that funding opportunities are widely disseminated to university personnel. Beth has served in various capacities at Virginia Tech for 10 years, including Asst. Director for Research Education and Development in the Office of Research. She also served as Administrative Director, Education and Outreach Director, and Diversity program coordinator for the Center for Power Electronics Systems, a National Science Foundation Engineering Research Center. Her background also includes service as Vice President for Sales and Marketing at a start-up company in the VT Corporate Research Center, as Developmental Editor at a subsidiary of International Thomson Publishing, and 10 years of combined teaching and academic program coordination experience at the University of Wisconsin-Madison and Indiana University.

**Panel Member: Thomas A. Campbell, PhD**



Dr. Thomas A. Campbell joined Virginia Tech in August, 2008. He currently serves as Associate Director for Outreach & Research Associate Professor with the Institute for Critical Technol-

ogy and Applied Science (ICTAS) at Virginia Tech. Within ICTAS, Dr. Campbell facilitates research programs in interdisciplinary, emerging, and disruptive technologies—including advanced materials, nanotechnology, bio-nanotechnology, nanomedicine (targeted drug delivery), nanometrology, materials processing, sensors, water, biomedical engineering, environmental health & safety, and mechanical and aerospace engineering. He has a history of successful proposal writing within the U.S. (NSF, DOD, NASA, NIH, NIST, ORNL, Virginia Tech) and Germany [Alexander von Humboldt Foundation, Deutscher Akademischer Austausch Dienst (DAAD), International Graduate School of Science and Engineering (IGSSE) at the Technical University of Munich (TUM)]. Prior to joining Virginia Tech, Dr. Campbell worked with ADA Technologies, Inc. in Littleton, Colorado—a small business specializing in creating and converting innovative technologies to commercial successes—where he served as Senior Research Scientist and Nanotechnology Program Manager. In his three years at ADA, he led research efforts supported by various federal sources. Dr. Campbell also worked for five years with Saint-Gobain, a Fortune 100 company. He held an Alexander von Humboldt Fellowship at the Kristallographischen Institut der Universität Freiburg from 1998 to 1999, during which he did postdoctoral research on advanced materials for the semiconductor industry. Dr. Campbell holds M.S. / Ph.D. degrees in Aerospace Engineering Sciences from the University of Colorado at Boulder and a B.E. degree in Mechanical Engineering from Vanderbilt University.



## Panel Member: R. Benjamin Knapp, PhD



R. Benjamin Knapp is the Director of the Institute for Creativity, Arts, and Technology (ICAT) and Professor of Computer Science at Virginia Tech University. ICAT seeks to promote research and education at the boundaries between art,

design, engineering, and science. Knapp also leads the Music, Sensors, and Emotion research group, with researchers in Ireland and the US. For more than 20 years, Knapp has been working to create meaningful links between human-computer interaction, universal design, and various forms of creativity. His research on human-computer interaction has focused on the development and design of user-interfaces and software that allow both composers and performers to augment the physical control of a musical instrument with direct sensory interaction. He holds twelve patents and is the co-inventor of the BioMuse system, which enables artists to use gesture, cognition, and emotional state to interact with audio and video media. In previous positions, Knapp has served as a Fulbright Senior Specialist at University College, Dublin, and chief technology officer of the Technology Research for Independent Living Centre. As the director of technology at MOTO Development Group in San Francisco, Calif., he managed teams of engineers and designers developing human-computer interaction systems for companies such as Sony, Microsoft, and Logitech. He co-founded BioControl Systems, a company that develops mobile bioelectric measurement devices for artistic interaction. Knapp has also served as professor and chair of the Department of Computer, Information, and Systems Engineering at San Jose State University. He earned doctorate and master's degrees in electrical engineering from Stanford University and a bachelor's degree in electrical engineering from North Carolina State University.

## Panel Member: Annie Aigster, PhD



Annelisse (Annie) Aigster is the Director of Interdisciplinary Graduate Education in the Graduate School at Virginia Tech. Aigster is a National Science Foundation Integrative Graduate Education and Research Traineeship (NSF-IGERT)

fellow. In 2009-10, Aigster served as Program Manager of the MILES IGERT at Virginia Tech. Aigster's interdisciplinary research involved studying macromolecules at the interface of biology and chemistry. She has presented her doctorate research at various professional conferences and has published her research in various journals. Since 2010, Aigster has led the Interdisciplinary Graduate Education efforts of the Graduate School at Virginia Tech. The Graduate School is supporting Interdisciplinary Graduate Education Programs (IGEPs) to promote and sustain interdisciplinary graduate education and research at Virginia Tech.



## Poster Session

ID	Title
1	<b>The Effect of Nanoparticles on Three Dimensional Printing</b> <i>Amelia Elliott</i> <i>Mechanical Engineering, Virginia Tech</i> <i>Design, Research, and Education for Additive Manufacturing Systems Lab</i>
2	<b>Bringing Biodiversity to Engineering</b> <i>Anupam Kumar Gupta, Philip Caspers, Rolf Müller</i> <i>Department of Mechanical Engineering, Virginia Tech</i>
3	<b>Using Accelerometers to Quantitatively Assess Infant General Movements for Early Detection and Intervention of Cerebral Palsy</b> <i>Ashley Taylor<sup>1</sup>, Al Wicks, Ph.D.<sup>1</sup>, Andre Muelenaer, M.D.<sup>2</sup></i> <i>1 Department of Mechanical Engineering, Virginia Tech</i> <i>2 Virginia Tech Carilion School of Medicine</i>
4	<b>Electric Field-Induced Assembly of Charged Particles on a Microelectrode</b> <i>Atieh Haghdoust<sup>1,2</sup>, Ranga Pitchumani<sup>1</sup></i> <i>1 Mechanical Engineering Department, Virginia Tech</i> <i>2 Material Science and Engineering Department, Virginia Tech</i>
5	<b>A Multi-Disciplinary Approach to Providing Visualizations for the Visually Impaired</b> <i>Austin Amaya<sup>1</sup>, Jacob Moore<sup>2</sup>, Ethan Groves<sup>3</sup> and Christopher Williams<sup>2</sup></i> <i>1 Department of Mathematics, Virginia Tech</i> <i>2 Departments of Engineering Education and Mechanical Engineering, Virginia Tech</i> <i>3 College of Engineering, Virginia Tech</i>
6	<b>Integrated Architectural Fabrication System</b> <i>Bandar Alkablan</i> <i>The College of Architecture and Urban Studies, School of Architecture + Design, Virginia Tech</i>
7	<b>Cellular Behavior in a Tunable Mechanistic Environment</b> <i>Brian Koons and Amrinder S. Nain.</i> <i>Mechanical Engineering, Virginia Tech</i>
8	<b>Bio-Inspires Control Structure for a Robotic Jellyfish</b> <i>Cassio T. Faria<sup>1</sup>, Shashank Priya<sup>1</sup>, Daniel J. Inman<sup>2</sup></i> <i>1 CIMSS, Mechanical Engineering, Virginia Tech</i> <i>2 Aerospace Engineering, University of Michigan</i>
9	<b>Cçmosensory Evaluation of Training and Oxidative Stress in Long Distance Runners</b> <i>Christan Whyson<sup>1</sup>, Kumar Mallikarjunan<sup>1</sup>, Per Gunnar Brodin<sup>2</sup>, Hara Misra<sup>2</sup>, and Zhenquan Jia<sup>2</sup></i> <i>1 Biological Systems Engineering, Virginia Tech</i> <i>2 Edward Via College of Osteopathic Medicine</i>
10	<b>An Interdisciplinary Approach to Cardiac Electrophysiology</b> <i>Edward Dougherty<sup>1</sup>, James Turner<sup>2</sup></i> <i>1 Genetics, Bioinformatics, Computational Biology Program, Virginia Tech</i> <i>2 Mathematics Department, Virginia Tech</i>
11	<b>Fatigue Analysis and Optimization of Rib-to-Deck Welds on Bridge Decks</b> <i>Hao Yuan, William J. Wright</i> <i>Department of Civil &amp; Environmental Engineering</i>
12	<b>Toward a New Model of Humanities Research: Interdisciplinarity in the Center for the Study of Rhetoric in Society</b> <i>Libby Anthony, Rachel Dinkins, Franny Howes, Heidi Lawrence, Michelle Seref, and Karen Spears</i> <i>English Department, Virginia Tech</i>
13	<b>Language Politics in the Dominican Republic: History, Migration and Globalization</b> <i>Ian M. Michalski</i> <i>Government and International Affairs (GIA), School of Public and International Affairs, Virginia Tech</i>
14	<b>Experimental Results from MARS Micro-CT System and Medipix Detectors</b> <i>James Bennett<sup>1</sup>, Peng He<sup>2</sup>, Hengyong Yu<sup>3</sup> Ge Wang<sup>1</sup></i> <i>1 Biomedical Imaging Division, School of Biomedical Engineering and Sciences (SBES), Virginia Tech</i> <i>2 College of Optoelectronic Engineering, Chongqing University, China</i> <i>3 Biomedical Imaging Division, School of Biomedical Engineering and Sciences (SBES), Wake Forest University</i>

ID	Title
15	<b>Interdisciplinary Design of Pervasive Computing</b> <i>Jason Forsyth<sup>1</sup>, Kahyun Kim<sup>2</sup>, Lisa McNair<sup>3</sup>, Tom Martin<sup>1</sup>, Eloise Coupey<sup>4</sup>, Ed Dorsa<sup>5</sup></i> <i>1 Electrical and Computer Engineering</i> <i>2 Industrial Systems Engineering</i> <i>3 Engineering Education</i> <i>4 Marketing</i> <i>5 Industrial Design</i>
16	<b>A Survey of Muskrat Intestinal Parasites in Virginia</b> <i>J. G. Da Silva Neto<sup>1</sup>, E. R. Hepner<sup>2</sup></i> <i>1 Fisheries and Wildlife, Virginia Tech</i> <i>2 Biological Sciences, Virginia Tech</i>
17	<b>Modeling Listeria monocytogenes Cross-contamination Model at Retail</b> <i>Jia Tang<sup>1</sup>, Daniel Gallagher<sup>1</sup>, and Regis Pouillot<sup>2</sup></i> <i>1 Civil and Environmental Engineering, Virginia Tech</i> <i>2 Food and Drug Administration</i>
18	<b>An insight in the innovation management practices: a case study in diverse business sectors</b> <i>Johanna Madrigal<sup>1</sup>, Melissa Brenes<sup>2</sup> and Henry Quesada<sup>3</sup></i> <i>1 Wood and Forest Products, Virginia Tech</i> <i>2 School of Business, Costa Rica Tech</i> <i>3 Wood and Forest Products, Virginia Tech</i>
19	<b>BCATc and the mTOR Pathway in Cancer Cells</b> <i>Josh Bostic, Elitsa Ananieva, and Susan Hutson</i> <i>Human Nutrition, Foods and Exercise</i>
20	<b>Local Soil Knowledge, Gendered Space, and Conservation Agriculture in the Andean Region, Bolivia</b> <i>Keri Agriesti<sup>1</sup>, Maria Elisa Christie, Dr.<sup>2</sup> and Rubén Botello<sup>3</sup></i> <i>1 Geography, Virginia Tech</i> <i>2 OIRED, Virginia Tech</i> <i>3 Fundación PROINPA – Foundation for Research and Promotion of Andean Products</i>
21	<b>Reducing Surgical Site Infections in Ambulatory Surgical Centers</b> <i>Kyle Harring<sup>1</sup> and Ebru Bish Ph.D<sup>2</sup></i> <i>1 Department of Biological Sciences, Virginia Tech Student</i> <i>2 Department of Industrial and Systems Engineering, Virginia Tech</i>
22	<b>Exploring Gender Relations and Pest Management Among Tomato Farmers in the Brong-Ahafo Region of Ghana</b> <i>Laura Zselezky<sup>1</sup>, Dr. Maria Elisa Christie<sup>2</sup>, Joyce Halegoab<sup>3</sup> and Dr. Awere Dankyi<sup>3</sup></i> <i>1 Government and International Affairs, Virginia Tech</i> <i>2 Department of Geography, Virginia Tech</i> <i>3 Crops Research Institute, Ghana</i>
23	<b>A simulation study of leaf litter decomposition in forested streams</b> <i>Laurence H. Lin and J.R. Webster</i> <i>Department of Biological Sciences, Virginia Tech</i>
24	<b>Engineering Analysis of Biosonar Beampatterns Across Different Bat Species</b> <i>Layin Cai, Mebram Motamedi, Rolf Müller</i> <i>Department of Mechanical Engineering, Virginia Tech</i>
25	<b>Entrepreneurship and Disability in Brazil</b> <i>Lynsyena Kirakosyan</i> <i>ASPECT, Virginia Tech</i>
26	<b>Advancing education through REAL-TIME Water-Quality Monitoring research</b> <b>Real-time stream monitoring creates an interactive, discovery based learning environment for undergraduate engineering students on the Virginia Tech campus.</b> <i>Mark R. Rogers<sup>1</sup>, Parhum Delgoshaei<sup>2</sup>, Vinod K Lohani<sup>2</sup></i> <i>1 Dept. of Civil and Environmental Engineering</i> <i>2 Dept. of Engineering Education</i>

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27	<b>Strengthening Interdisciplinary Collaboration around Sustainable Agriculture at United States Colleges and Universities</b> <i>Matthew C. Benson &amp; Lisa S. Hightower</i> <i>Agriculture and Extension Education, Virginia Tech</i>
28	<b>Transport, Stability, and Deposition of Functionalized Gold Nanoparticles in Porous Media</b> <i>Matthew Y. Chan<sup>1</sup>, Matthew S. Hull<sup>1</sup>, Jason C. Jones<sup>2</sup>, Peter J. Vikesland<sup>1</sup></i> <i>1 Virginia Tech, Department of Civil and Environmental Engineering, Blacksburg, Virginia, USA.</i> <i>2 Virginia Tech, Department of Materials Science and Engineering, Blacksburg, Virginia, USA.</i>
29	<b>Labeling of single, intact plant root cells using laser-mediated optoperforation</b> <i>Megan LeBlanc<sup>1</sup>, Travis Merritt<sup>2</sup>, James Westwood<sup>1</sup>, and Giti Khodaparast<sup>2</sup></i> <i>1 Department of Plant Pathology, Physiology and Weed Science, Virginia Tech</i> <i>2 Department of Physics, Virginia Tech</i>
30	<b>Bio-inspired Antifouling: A Study of Bacterial Adhesion on Highly Aligned Networks of Polymeric Nanofibers</b> <i>Mehdi Kargar<sup>1</sup>, Jeff Saucke<sup>1</sup>, Amrinder Nain<sup>1,2</sup> and Bahareh Behkam<sup>1,2</sup></i> <i>1 Mechanical Engineering Department, Virginia Tech, Blacksburg, VA</i> <i>2 School of Biomedical Engineering and Sciences Virginia Tech, Blacksburg, VA</i>
31	<b>Proteomic Profiling of Cell Cycle Reentry and Progression in Breast Cancer</b> <i>Milagros J. Tenga and Iuliana M. Lazar</i> <i>Department of Biological Sciences, Virginia Tech, Blacksburg, VA 24061</i>
32	<b>Filament bundling drives NWASP mediated processive barbed end attachment</b> <i>Nimisha Khanduja, Jeffery Kuhn</i> <i>Department of Biological Sciences, Virginia Tech.</i>
33	<b>Engineering Analysis of Beamforming Shapes in Bat Biosonar</b> <i>Ojili Praveen Kumar, Reddy<sup>1</sup>, Cindy Grimm<sup>2</sup>, M. Shahriar Hossain<sup>3</sup>, Rolf Müller<sup>1</sup></i> <i>1 Department of Mechanical Engineering, Virginia Tech</i> <i>2 Dept. of Computer Science and Engineering, Washington University in St. Louis</i> <i>3 Dept. of Computer Science, Virginia Tech</i>
34	<b>Nanocellulose: Characterization, Environmental Impacts and Sustainability</b> <i>Paramjeet Pati<sup>1</sup>, Peter J. Vikesland<sup>1</sup> and Scott Renneckar<sup>2</sup></i> <i>1 Department of Civil and Environmental Engineering, Virginia Tech</i> <i>2 Department of Wood Science and Forest Products, Virginia Tech</i>
35	<b>Evolution of organic nitrogen in landfill leachates with landfilling age and spectral study with solid state 15N NMR</b> <i>Renzun Zhao<sup>1</sup>, John T Novak<sup>1</sup>, C. Douglas Goldsmith<sup>2</sup></i> <i>1 Department of Civil and Environmental Engineering, Virginia Tech</i> <i>2 Alternative Natural Technologies, Inc.</i>
36	<b>Breaking down barriers: A Survey of Central American Forest Products Retailers and Manufacturers</b> <i>Scott Lyon and Henry J. Quesada-Pineda</i> <i>Department of Wood Science and Forest Products, Virginia Tech</i>
37	<b>Phosphonium-Containing Polyelectrolytes for Nonviral Gene Delivery</b> <i>Sean T. Hemp<sup>1,3</sup>, Michael H. Allen, Jr.<sup>1,3</sup>, Matthew D. Green<sup>2,3</sup>, and Timothy E. Long<sup>1,3</sup></i> <i>1 Department of Chemistry, Virginia Tech</i> <i>2 Department of Chemical Engineering, Virginia Tech</i> <i>3 Macromolecules and Interfaces Institute</i>
38	<b>Using Social Traps to Influence the Design of Distributed Dynamic Cooperative Systems</b> <i>Shaimaa Lazem<sup>1,2</sup>, Denis Gracanin<sup>1,2</sup></i> <i>1 Department of Computer Science, Virginia Tech</i> <i>2 Center for Human-Computer Interaction, Virginia Tech</i>
39	<b>Lean Energy: Reducing Energy Waste in the Forest Products Industry</b> <i>Shawn Crawford</i> <i>Department of Wood Science and Forest Products</i>

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40	<b>A Discrete Model of Iron Metabolism in Lung Epithelial Cells with Fungal Challenge</b> <i>Shernita Lee<sup>1</sup>, Kahmya McAlpina<sup>2</sup>, John Nardini<sup>3</sup>, Leslie Myint<sup>4</sup>, Reinhard Laubenbacher<sup>5</sup></i> <i>1 Genetics, Bioinformatics, and Computational Biology Program, Virginia Tech</i> <i>2 Oakwood University, Huntsville, AL</i> <i>3 North Carolina State University, Raleigh, NC</i> <i>4 Johns Hopkins University, Baltimore, MD</i> <i>5 Virginia Bioinformatics Institute, Blacksburg, VA</i>
41	<b>Drinking Water Consumption in Healthy Adults: Implications of Age, Flavor Preference, and Beverage Choices</b> <i>Susan Mirlohi<sup>1</sup>, Andrea M. Dietrich<sup>1</sup>, Susan E. Duncan<sup>2</sup>, and Brenda Davy<sup>3</sup></i> <i>1 Department of Civil and Environmental Engineering, Virginia Tech;</i> <i>2 Department of Food Science and Technology, Virginia Tech;</i> <i>3 Department of Human Nutrition, Foods, and Exercise, Virginia Tech; Blacksburg, Virginia, USA.</i>
42	<b>PMMA Polymer System Development for Nanofiber Applications in Biomedical and Advanced Materials</b> <i>Tim O'Brien, Amrinder Nain</i> <i>Mechanical Engineering, Virginia Tech</i>
43	<b>A bioimpedance sensor for the detection of breast cancer cells in a tri-culture cell model</b> <i>Vaishnavi Srinivasaraghavan, Jeannine Strobl and Masoud Agab</i> <i>Bradley Department of Electrical and Computer Engineering, Virginia Tech.</i>
44	<b>PTM Profiling of Breast Cancer Cells for Signaling and Biomarker Discovery</b> <i>Wooram Lee and Iulia M. Lazar</i> <i>Department of Biological Sciences, Virginia Tech</i>
45	<b>High Performance Sorbents for Carbon Capture</b> <i>Xu Zhou<sup>1</sup>, Jing Niu<sup>2</sup> and Riddhika Jain<sup>2</sup>, S. Richard Turner<sup>3</sup>, Roe-Hoan Yoon<sup>2</sup>, Diego S. Troya<sup>1</sup>, Richard D. Gandour<sup>1</sup></i> <i>1 Department of Chemistry at Virginia Tech</i> <i>2 Department of Mining and Minerals Engineering at Virginia Tech</i> <i>3 Macromolecules and Interfaces Institute at Virginia Tech</i>
46	<b>Haptic Reading System for The Blind</b> <i>Yasmine Elglaly<sup>1</sup>, Francis Quek<sup>1</sup>, Tonya Smith-Jackson<sup>2</sup></i> <i>1 Computer Science, Virginia Tech</i> <i>2 Industrial and Systems Engineering, Virginia Tech</i>



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# 2011 Compendium

The Interdisciplinary Research Symposium

November 4th 2011

At the Graduate Life Center

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