About the Capstone Conference

The Virginia Modeling, Analysis and Simulation Center (VMASC) of Old Dominion University is hosting the 2013 Modeling, Simulation, & Visualization Student Capstone Conference on April 11th. The Capstone Conference features students in Modeling and Simulation (M&S) undergraduate & graduate degree programs and fields from many colleges or universities. Students present their research to an audience of fellow students, faculty, judges, and other distinguished guests. For the students, these presentations afford them the opportunity to impart their innovative research to members of the M&S community from academic, industry, and government backgrounds. The Student Capstone Conference offers seven presentation tracks this year. The best paper and the best presentation in each track will receive awards.

TRACKS

General Science and Engineering
Homeland Security/Military
Medical and Health Care
Gaming and Virtual Reality
Training and Education
Business and Industry
Transportation

2013 STUDENT CAPSTONE CONFERENCE

SCHEDULE

8:00 - 8:30   Registration, Reception, Breakfast
8:30 - 8:50   Opening Remarks
9:00 - 10:00  Track Presentations
10:00 - 10:20  Morning Break
10:20 - 11:40  Track Presentations
11:40 - 1:30   Lunch
1:30 - 2:50   Track Presentations
2:50 - 3:10   Afternoon Break
3:10 - 4:30   Track Presentations
4:30 - 5:00   Reception
5:00 - 6:00   Speaker & Awards

www.vmasc.odu.edu/capstone2013
Welcome

Old Dominion University Department of Modeling, Simulation and Visualization Engineering (MSVE) and the Virginia Modeling, Analysis and Simulation Center (VMASC) welcome you to the seventh annual Modeling, Simulation & Visualization (MS&V) Student Capstone Conference.

The Conference features student research and student projects that are central to MS&V. Also participating in the conference are faculty and judges who have volunteered their time to impart direct support to their students’ research, facilitate the various conference tracks, serve as judges for each of the tracks, and provide overall assistance to this conference.

Appreciating the purpose of the conference and working in a cohesive, collaborative effort will no doubt result in a successful symposium for all involved. Thank you for joining us!

Sincerely,

Rick McKenzie,
Capstone Conference Chair
rdmckenzi@odu.edu

John Shull,
Capstone Conference Vice Chair
jshull003@odu.edu

Joseph P. Ruddy
President and Chief Executive Officer
Virginia International Terminals Inc.
Norfolk, Virginia

Joe Ruddy has recently been appointed as President & CEO of Virginia International Terminals, Inc. He holds a Bachelor’s Degree from Virginia Wesleyan College, and a Master’s Degree from the College of New Jersey, formerly Trenton State.

As Executive Vice President & Chief Operating Officer of the Virginia International Terminals, Joe Ruddy was responsible for Terminal Operations, Engineering & Maintenance, and Information Technology. Preceding his role as Executive Vice President, he served as the Director of Operations & Labor at VIT. In addition, he held managerial positions at Virginia Intermodal Management, as well as for several ship lines such as CMA-CGM and NSCSA. He currently serves as Immediate Past Chairman for the Hampton Roads Shipping Association.
### Medical & Health Care Simulation

**Session Chair:** Dr. Michel Audette (ODU)  
**Judges:** Dr. Andrea Parodi (VMASC), Dr. Michel Audette (ODU)

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<tr>
<th>Time</th>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>10:00-10:20am</td>
<td>Erik G. Prytz</td>
<td>Department of Psychology-ODU</td>
<td>Using a Spatial Task to Measure Lepreconal Mental Workload: Lessons Learned and Initial Results</td>
</tr>
<tr>
<td>10:20-10:40am</td>
<td>Tyrell Gardner, Spencer Lane, Lucas Lezzi, and Tien Phan</td>
<td>MSVE-ODU</td>
<td>Dynamic Architecture for Simulation-Based Obstetrics Training</td>
</tr>
<tr>
<td>10:40-11:00am</td>
<td>Margaret Lubas, and Gianluca De Leo</td>
<td>MSW-ODU</td>
<td>Grief Support Groups in Second Life: Exploring Professional Opportunities to Increase and Improve Grief Support</td>
</tr>
<tr>
<td>11:00-11:20am</td>
<td>Sharmi Sethana, Taneen Rashid, and Christian Zemlin</td>
<td>MSVE-ODU</td>
<td>Occurrences of Delayed After-Depolarizations and Triggered Activity in RNC Model</td>
</tr>
<tr>
<td>11:20-11:40am</td>
<td>John Donahue, and Yan Peng</td>
<td>Department of Mathematics and Statistics-ODU</td>
<td>Modeling and Simulation of the Shape Recovery of Red Blood Cells</td>
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<td></td>
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<td>CS-ODU</td>
<td>A Parallel Marching Cubes Algorithm for Extracting Isosurfaces from Medical Images</td>
</tr>
<tr>
<td>1:30-1:50pm</td>
<td>Jing Xu, and Andrey N. Chernikov</td>
<td>CS-ODU</td>
<td>Estimating Lower Bounds on the Length of Protein Polymer Chain Segments using Robot Motion Planning</td>
</tr>
<tr>
<td>1:50-2:10pm</td>
<td>Andrew McKnight, Jing He, Nikos Christodoulides and Andrey Chernikov</td>
<td>CS-ODU</td>
<td>Estimating Lower Bounds on the Length of Protein Polymer Chain Segments using Robot Motion Planning</td>
</tr>
<tr>
<td>2:10-2:30pm</td>
<td>Dong Si, Hani Elsayed-Ali, Wei Cao, Olga Pahkerson, Howard White, and Jing He</td>
<td>CS-ODU / ECE/ODU / Health Sciences-ODU / Physiological Sciences-EVMS / CS-ODU</td>
<td>Simulation of the Localized 3-dimensional Reconstruction for Electron Cryo-tomography</td>
</tr>
<tr>
<td>2:30-2:50pm</td>
<td>Lin Chen, Kamal Al Nsir, Jing He</td>
<td>CS-ODU / CS-Howard University / CS-ODU</td>
<td>Estimating Lower Bounds on the Length of Protein Polymer Chain Segments using Robot Motion Planning</td>
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### Business & Industry

**Session Chair:** Dr. Jim Leathrum (ODU)  
**Judges:** Dr. Andy Collins (VMASC), Dr. Jim Leathrum (ODU)

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<tr>
<td>1:30-1:50pm</td>
<td>Daniele Vorn-Bido, Andrew Collins, and Michael Sellor</td>
<td>MSVE-ODU</td>
<td>Exploring the Geospatial Effect on Foreclosure Contagion Using Agent-Based Modeling and Simulation</td>
</tr>
<tr>
<td>1:50-2:10pm</td>
<td>Xiaolian Wang</td>
<td>MSVE-ODU</td>
<td>Popularity or Productivity? Understanding the Impacts of Instrumental and Intrinsic Preferential Attachment on Social Network Formation Employing Agent-based Modeling</td>
</tr>
<tr>
<td>2:10-2:30pm</td>
<td>Callie Davis</td>
<td>GPIS-ODU</td>
<td>Investigating Theoretical Frontiers in International Relations</td>
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<tr>
<td>2:30-2:50pm</td>
<td>David Wright</td>
<td>MSVE-ODU</td>
<td>The Induction of Community Dynamics in Online Social Networks</td>
</tr>
<tr>
<td>3:10-3:30pm</td>
<td>Rebecca Law</td>
<td>International Studies-ODU</td>
<td>A Conceptual Model Utilizing Evolutionary Game Theory to Explore the Effects of Discount Factors on Interactions Between International Organizations</td>
</tr>
<tr>
<td>3:30-3:50pm</td>
<td>David Flamagne, Andrew Collins, and Barry Ezeell</td>
<td>MSVE-ODU</td>
<td>Reducing Stakeholder Fatigue: Integrating Governing Bodies, Committees and Working Groups Contribution to Risk Management</td>
</tr>
<tr>
<td>3:50-4:10pm</td>
<td>Yishu Zheng</td>
<td>MSVE-ODU</td>
<td>Determinants of Seafarer Fatal and Non-fatal Injuries in Container Vessel Accidents</td>
</tr>
<tr>
<td>4:10-4:30pm</td>
<td>Elizabeth Rafterick, Jimmy Hilton, Frederick Guy Wilbon</td>
<td>Business and Public Administration-ODU</td>
<td>A Study of Contagion Spread Among a Finite Human Population on a Naval Vessel</td>
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### Training & Education

**Session Chair:** Mr. Sol Sherfey  
**Judges:** Mr. Sol Sherfey (VMASC), Dr. Roland Mielke (ODU)

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<tr>
<td>10:40-11:00am</td>
<td>Rebecca Law</td>
<td>International Studies-ODU</td>
<td>Using Agent-Based Modeling to Understand the Effects of Privately Contracted Security Teams on Pirate Behavior and Maritime Vessel Route Selection in the Horn of Africa</td>
</tr>
<tr>
<td>11:00-11:20am</td>
<td>Yi-Ching Lin</td>
<td>Department of Education-ODU</td>
<td>Developing a Simulation for College Students Learning the Rate of Law in Chemistry</td>
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### Homeland Security & Military

**Session Chair:** Dr. Bharat Madan (ODU)  
**Judges:** Dr. Barry Ezell (VMASC), Dr. Bharat Madan (ODU)

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<tr>
<td>3:10-3:30pm</td>
<td>Christopher Lynch, Salkou Diallo, and Andreas Talk</td>
<td>MSVE-ODU</td>
<td>Representing the Ballistic Missile Defense System using Agent-based Modeling</td>
</tr>
<tr>
<td>3:30-3:50pm</td>
<td>Nicholas Wright, and Robert Keyley</td>
<td>United States Military Academy</td>
<td>Validation Report of Composer Propagation Simulation: Case Study of Camp Blanding, FL</td>
</tr>
<tr>
<td>3:50-4:10pm</td>
<td>Shiwei Jiang</td>
<td>International Studies-ODU</td>
<td>Game Theory and the North Korea Nuclear Puzzle</td>
</tr>
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Science & Engineering
Session Chair: Dr. Masha Sosonkina (ODU)
Judges: Dr. Bridget Giles (VMASC), Dr. Masha Sosonkina (ODU)

9:00-9:20am
Wei Li, Zhaoxi Guo, and Li-Shi Luo
Department of Mathematics and Statistics-ODU / Huazhong University of Science and Technology
Modeling Two Dimensional MolecularCouette Flows in a Nano-Scale Channel

9:20-9:40am
Bradley Lesher, Christopher Johnson, Timothy Hahn, and Michael LePuma
Department of Mechanical and Aerospace Engineering-ODU
Experience of Using ANP for AV Design Improvement

9:40-10:00am
Panon Phuwarawong, and Rahul Zhou
Department of Mathematics and Statistics-ODU
Simulation of Dynamic Structures of Active Nematic Nano Particle

10:20-10:40am
Jan Nalewajski
International Studies-ODU
Measuring success of Separates' demands: Development of the Tool

10:40-11:00am
Srinavas Mudal, and N. Rao Chaganty
Department of Mathematics and Statistics-ODU
Simulation of Dynamic Structures of Active Nematic Nano Particle

11:00-11:20am
Ange Lionel Tope
VMASC-ODU
Describing the role of calibration in system dynamics models: Some issues and answers

11:20-11:40am
Joseph C. Miller III
MSVE-ODU
An Analysis of Various GPU Implementations of Saint-Venant Shallow Water Equations

1:30-1:50pm
Hamdi Kavak
MSVE-ODU
Simulation on the Clouds

1:50-2:10pm
Ocay Sabun
MSVE-ODU
Exploring the M&S Body of Knowledge

2:10-2:30pm
Kevin Byron, and Daniel Dauer
Biological Sciences-ODU
Autocorrelation Functions Applied to the Benthic Community of the Chesapeake Bay Suggest a Lack of Seasonality

Transportation
Session Chair: Dr. ManWo Ng (ODU)
Judges: Dr. Mike Robinson (VMASC), Dr. Mecit Cetin (VMASC)

9:00-9:20am
Terra Elite
MSVE-ODU
Simultaneous Pedestrian and Vehicle Evacuation: A Concept

9:20-9:40am
Khairul Anuar
CE-ODU
Impact of Time of Day on Emergency Vehicle Travel Time Based on GPS Data

9:40-10:00am
Abdulla Alasaadi, and Ilyas Ustun
MSVE-ODU
Classifying Vehicle State by Using Acceleration Data Collected from Smartphones

10:20-10:40am
Abdullahi Al Fawaz
MSVE-ODU
A Model for Labeling Rank of Each Node in a Directed Transportation Network

10:40-11:00am
Ozlem Unal
MSVE-ODU
A Simple and a Fuel Consumption-based Model for Optimal Driving Strategy by Using Probe Vehicle Data

11:00-11:20am
Mofiyah Koko
Department of Engineering Management and Systems Engineering-ODU
Simulation Study: Impact of Custom and Check Points on Entity Flow in Seaports

11:20-11:40am
Khairul Anuar, Peter Foytik, and Ilyas Ustun
CE-ODU / MSVE-ODU / MSVE-ODU
Performance Comparison Between Cube and TransCAD in Solving Traffic Assignment Problem

Gaming & Virtual Reality
Session Chair: Dr. Yuzhong Shen (ODU)
Judges: Mr. Hector Garcia (VMASC), Dr. Yuzhong Shen (ODU)

1:30-1:50pm
Leigh Ann Diggis, Elena Radici, Tom Mastiglio, and Gianluca De Leo
Health Sciences-ODU / ODU / MYMIC LLC / Health Sciences-ODU
Measuring Sense of Presence and User Characteristics to Predict Effective Training in an Online Simulated Virtual Environment

1:50-2:10pm
Gary Lawson, Riffat Aras, and Yuzhong Shen
MSVE-ODU
Natural User Interfaces for Learning and Exploration

2:10-2:30pm
Antam Das Nijhar
CS-ODU
Lessons Learned from iOS Application Development: Towards Apps for M&S and Games

2:30-2:50pm
Carmelo Padrino-Barrion, Gayle McCombs, Norou Diewara, and Gianluca De Leo
RDH / RDH / PhD / Health Sciences-ODU
Use of Interactive Immersive Visualization for the Control of Dental Anxiety During Dental Hygiene Treatment