UCF Modeling & Simulation Graduate Program

M&S Seminar Series: The DISSERTATION Edition

Join us this month as we highlight the exciting work that our M&S doctoral and dissertation students are pursuing!

The Influence of Task-Role Mental Models on the Perception of Robot Motion Behavior

Presented by Scott Ososky, M.S.
October 11, 2013
12:00-1:00pm
Partnership II , Rm 141

A Dynamic Enrollment Simulation Model for Planning and Decision Making in a University

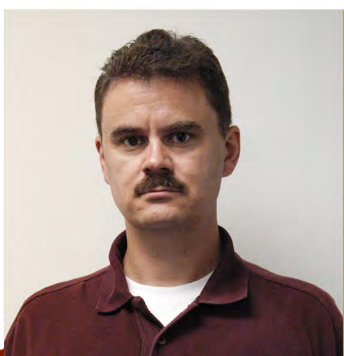
Presented by Luis Robledo, M.S.
October 14, 2013
11:00-12:00pm
Partnership III, Rm 233

Brain-Computer Interfacing

Presented by Alan Paris, M.S.
October 16, 2013
3:00-4:00pm
Partnership III, Rm 233

Analysis of Medical Holography for Anatomy Education

Presented by Matthew Hackett, M.S.
October 21, 2013
10:00-11:00am
Partnership III, Rm 233



The Effects of Olfactory Adaptation On Human Performance

Presented by William Y. Pike , M.S.
October 23, 2013
1:00-2:00pm
Partnership III, Room 233

Examining the Effects of Achievements and Narrative on Learning, in a Serious Game

Presented by Joseph Fanfarelli, M.S.
October 30, 2013
2:30-3:30pm
Partnership III, Rm 233

UCF MODELING & SIMULATION GRADUATE PROGRAM

M&S Seminar Series: The Dissertation Edition

The Influence of Task-Role Mental Models on the Perception of Robot Motion Behavior

- **Presented by Scott Ososky, M.S.**
- October 11, 2013 • 12:00-1:00pm • Partnership II , Rm 141
- Physical address: 3100 Technology Parkway, Orlando, FL

Presentation Overview

The transition in robotics from tools to teammates has begun. Humans currently tele-operate robotic systems in a variety of military and civilian contexts. As technology enables robots with greater intelligence and autonomy, human teammates must possess a clear and accurate understanding of robots. The problem is, the quality of futuristic robot teammates will be diminished if humans misunderstand or misinterpret their behavior. Failure to accurately perceive the behaviors of robots may result in a loss of trust in robots during critical or dangerous situations.

Mental models are presented as the underlying theory describing the organizing framework for human understanding of robots. The purpose of this presentation is to examine the influence of task-role mental models on the interpretation of robot motion behaviors, and the resulting impact on observers' ratings of robots, including trust. Previous research has examined each of these aspects separately, however not in combination within a task-oriented environment. Implications for mental model theory, and the design of robot behaviors, with respect to readability, will be discussed.

Speaker Biography

Scott Ososky, M.S., is a Graduate Research Associate at the Team Performance Laboratory of the Institute for Simulation and Training at UCF, and a doctoral candidate in the Modeling and Simulation program. His interdisciplinary research interests include human–robot interaction, mental models, unmanned ground vehicles, human-in-the-loop simulation, simulation usability, discrete event simulation, and instructional design.

UCF MODELING & SIMULATION GRADUATE PROGRAM

M&S Seminar Series: The Dissertation Edition

A Dynamic Enrollment Simulation Model for Planning and Decision Making in a University

- **Presented by Luis Robledo, M.S.**
- October 14, 2013 • 11:00-12:00pm • Partnership III , Rm 233
- Physical address: 3100 Technology Parkway, Orlando, FL

Presentation Overview

Decision support systems for university management have had limited improvement in the incorporation of new cutting-edge techniques. Most decision-makers use traditional forecasting methods to base their decisions in order to maintain financially affordable programs and keep universities competitive for the last few decades.

Strategic planning for universities has always been related to enrollment revenues, and operational expenses. Enrollment models in use today are able to represent forecasting based on historical data, considering usual variables like student headcount, student credit, etc. No consideration is given to students' preferences. Retention models, associated to enrollment, deal with average retention times leaving off preferences as well.

Preferences play a major role as many students do not declare their intentions (major) immediately. Even if they do, they may change it if they find another, more attractive major, or they may even decide to leave college for external reasons.

Enrollment models have been identified to deal with three main purposes: prediction of income from tuition (in-state, out-of-state), planning of future courses and curriculum, and allocation of resources to academic departments, This general perspective does not provide useful information to faculty and Departments for detailed planning and allocation of resources for the next term or year. There is a need of new metrics to help faculty and Departments to reach a detailed and useful level in order to plan effectively this allocation of resources.

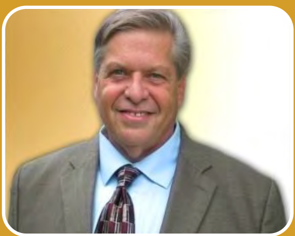
The dynamics in the rate-of-growth, the preference student have for certain majors at a specific point of time, or economic hardship make a difference when decisions have to be made for budgets requests, hiring of faculty, classroom assignment, parking, transportation, or even building new facilities. Existing models do not make difference between these variables.

This simulation model is a hybrid model that considers the use of System Dynamics, Discrete-event and Agent-based simulation, which allows the representation of the general enrollment process at the University level (strategic decisions), and enrollment, retention and major selection at the College (tactical decisions) and Department level (operational decisions). This approach allows lower level to predict more accurately the amounts of students retained for next term or year, while allowing upper levels to decide on new students to admit (first time in college and transfers) and results on recommendations on faculty hiring, class or labs assignment, and resource allocation, among others.

This model merges both high and low levels of student's enrollment models into one application, allowing not only representation of the current overall enrollment, but also prediction and retention at College and Department level, henceforth optimal classroom assignments, faculty and student allocation, among others.

UCF MODELING & SIMULATION GRADUATE PROGRAM

M&S Seminar Series: The Dissertation Edition



Brain-Computer Interfacing

- **Presented by Alan Paris, M.S.**
- October 16, 2013 • 3:00-4:00pm • Partnership III, Rm 233
- Physical address: 3100 Technology Parkway, Orlando, FL

Presentation Overview

Brain-computer interfacing (BCI) or brain-machine interfacing (BMI) is that field of neuroengineering which seeks to connect the human central nervous system directly to electro-mechanical devices for the purpose of control and communication, either by measuring the electro-magnetic fields generated by nervous activity or by means of surgically-implanted electrodes.

BCI is a highly interdisciplinary field which may be regarded as a branch of applied cybernetics, defined in 1940's by its creator Norbert Wiener as "the study of control and communication in the animal and the machine."

Although its philosophical origins go back at least to the 17th century and the mind-body problem of Descartes, it was only the invention of the electroencephalogram (EEG) by Hans Berger in the 1920's which demonstrated the basic scientific feasibility of direct brain-to-machine communication.

More recently, developments in BCI have focused on using modern communication, signal processing, computation, and surgical techniques to enable severely neurologically-impaired individuals to interact proactively with their environments. However, the spin-offs of these developments impact areas all the way from epilepsy and coma research to jet fighter control. Its future horizons are unlimited but it also creates profound social and philosophical issues which are both exhilarating and disturbing.

This talk will briefly scan the history of BCI, a few of the neuroengineering BCI techniques which are currently in use, and some of the standard applications of BCI to disabled individuals, law enforcement, and the military. It will also highlight a few of the broader ethical and philosophical issues raised by this new technology.

In addition, the speaker's current BCI research under the supervision of Prof.'s Azadeh Vosoughi and George Atia of EECS will be summarized as well as other BCI research opportunities which may be of interest to the larger Modeling & Simulation community.

M&S Seminar Series: The Dissertation Edition

Analysis of Medical Holography for Anatomy Education

- **Presented by Matthew Hackett, M.S.**
- October 21, 2013 ● 10:00-11:00am ● Partnership III, Rm 233
- Physical address: 3100 Technology Parkway, Orlando, FL

Presentation Overview

The conceptualization of three-dimensional (3D) images within the human brain is a difficult task requiring extensive use of the brain's working memory. In the medical education community, this problem is particularly prevalent due to the complex 3D structures inherent in human anatomy. One potential solution to this problem is to present medical content in 3D dimensions rather than 2D or 2.5D. In doing so, the trainee would no longer be burdened with the additional cognitive load imposed during conversion of a 2/2.5D representation to a 3D representation within working memory. A unique technological solution to achieve this uses holography to present the medical content. Holography allows the user to view fully parallax, auto-stereoscopic 3D images. Within this research effort, static, full-color holograms were created depicting medical content. This presentation will discuss current research in 3D medical education, holography, and an initial pilot study.

Speaker Biography

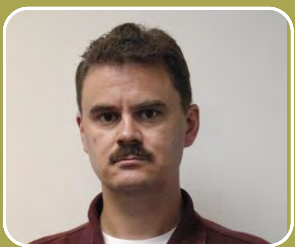
Matthew Hackett is a research engineer for the Medical Simulation Research Branch of the Army Research Laboratory, Simulation and Training Technology Center. He manages a variety of projects including the medical holography research and virtual patient research efforts. As a research engineer, he oversees these research efforts and conducts test and evaluation to determine their efficacy in the simulation and training domain.

Prior to his work with ARL, Mr. Hackett trained as a government engineer as an engineering intern at the Program Executive Office for Simulation, Training and Instrumentation and worked within PM Training Devices.

Mr. Hackett received his Bachelor of Science in Computer Engineering from the University of Central Florida and his Masters of Science in Biomedical Engineering from the University of Florida. During his time at the University of Florida, he was a research assistant in the computational neuroscience laboratory, studying the functionality of neurons and how the brain creates neuronal networks. Mr. Hackett received his Masters of Science in Modeling and Simulation and is currently pursuing his Ph.D. in Modeling and Simulation at the University of Central Florida.

UCF MODELING & SIMULATION GRADUATE PROGRAM

M&S Seminar Series: The Dissertation Edition



The Effects of Olfactory Adaptation On Human Performance

- **Presented by William Y. Pike, M.S.**
- October 23, 2013 ● 1:00-2:00pm ● Partnership III, Rm 233
- Physical address: 3100 Technology Parkway, Orlando, FL

Presentation Overview

Malodors have been linked to a variety of human performance issues, including stress, anger, and confusion, performance of complex tasks, increased startle reflex, decrease in performance of tasks involving short-term memory, and increase in escape ("flight" or "avoidance") behavior.

Olfactory adaptation, defined as a desensitization to odors (Steinmetz, Pryor, and Stone, 1970), has been measured by detection threshold and perceived intensity (Berglund, Berglund, Engen, & Lindvall, 1971; Dalton & Wysocki, 1996; Dalton, 1996; Goyert, Frank, Gent, & Hettinger, 2007; Jacob, Fraser, Wang, Walker, & O'Connor, 2003; Steinmetz et al., 1970; Stone, Pryor, & Steinmetz, 1972). There is little in the currently available literature to show a link between adaptation and any human performance area. The current research proposes to explore of the ability of olfactory adaptation to offset human performance degradation. Specifically, the research will seek to answer whether during the performance of a task relevant to the sample population olfactory adaptation might decrease over time initial escape and avoidance behaviors, stress, and confusion in the presence of a malodor while raising performance levels to equivalence with those achieved when NOT in the presence of a malodor.

Speaker Biography

William Y. (Bill) Pike is a doctoral candidate in the University of Central Florida's Modeling & Simulation program. He received a Bachelor of Science degree from the University of West Florida in Systems Science with a minor in mathematics in 1987. He received two Masters degrees, both from UCF: Computer Engineering in 1993, and Modeling & Simulation in 2012.

Bill is a Science and Technology Manager with the Army Research Lab's Simulation and Training Technology Center. His work focuses on various aspects of medical simulation research, including the use of simulated malodors to improve realism in medical training events, medical simulation training scenario repositories, and state-of-the-art sensors for patient simulators. In addition, Bill is a commissioned officer in the US Navy Reserves as an Engineering Duty Officer. He holds the rank of Commander (O5), and was recently selected for his fifth commanding officer position.

Bill has authored or co-authored 18 papers and two book chapters, with an additional paper and book chapter in press.

M&S Seminar Series: The Dissertation Edition

Examining the Effects of Achievements and Narrative on Learning, in a Serious Game

- **Presented by Joseph Fanfarelli, M.S.**
- October 30, 2013 ● 2:30-3:30pm ● Partnership III, Rm 233
- Physical address: 3100 Technology Parkway, Orlando, FL

Presentation Overview

Gaming has been growing in popularity, steadily working its way to the forefront of the entertainment industry. As testament to its growing support, the U.S. gaming industry has surpassed the movie and music industries in total revenue within the last decade. Developers of serious games, or games for purposes other than entertainment, have been attempting to adapt video games for purposes that are beneficial to training and education. Research has shown widely varying amounts of effectiveness in this endeavor. This dissertation seeks to expand the knowledge base on the effective design of serious games for education, in an effort to increase the effectiveness of future serious games. Specifically, this dissertation will examine achievement systems and narrative manipulations, and their effects on learning, in a serious game.

Speaker Biography

Joseph Fanfarelli, M.S. is a Graduate Research Assistant at the College of Arts and Humanities at UCF. He began his graduate studies in the ACTIVE Lab at the Institute for Simulation and Training, where he studied a range of topics, including training for military robotics, simulation interoperability, human factors in nuclear regulation, and beyond. Joseph is primarily interested in serious games. Specifically, he is interested in the design of video games for education and training to improve the efficacy of learning, while making the process more enjoyable to the learner.