Vision-Based Hand-Gesture Applications Research
Featured In Communications of the ACM

Mathias Kölsch and his colleagues were recently featured on the cover of the Communications of the ACM online journal. The article discusses describes the requirements of hand-gesture interfaces and the challenges in meeting the needs of various application types. To see the full version of the article click here: Vision-Based Hand-Gesture Applications | February 2011 | Communications of the ACM

Massive Multiplayer Online Wargame Leveraging the Internet (MMOWGLI)

The Massive Multiplayer Online Wargame Leveraging the Internet (MMOWGLI) is a new game based on social-networking techniques that is designed to encourage innovative collaboration on a hard problem. Players from across the Navy and the civilian world will be asked to explore new options for dealing with maritime piracy challenges. MMOWGLI is an online game designed to find and collectively grow breakthrough ideas to some of our most “wicked problems.” Many 21st-century threats challenge us to try new forms of collaboration that can help create truly innovative ideas.

In Spring 2011, MMOWGLI will launch by exploring a fast-paced interactive scenario of piracy off the coast of Somalia. Unexpected new forces are flooding the region, while cutting-edge tools are pushing fleet capabilities and pirate tactics. Meanwhile, political-economic disruptions mean that land-based strategies are just as critical as responses at sea.

Your ideas are needed. You’ll join other innovators and creative thinkers from within and beyond the military. The MMOWGLI team would like to invite you to preregister to play the game: mmowgli.nps.edu

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...and more!
Here in the ‘Where Are They Now’ column, we feature updates from our alumni spanning the globe and scope of work in modeling and simulation. In a casual Q&A style interview, we focus on a specific alumnus as they share what they’ve been up to since they’ve taken their education and skills beyond the Naval Postgraduate School.

Featuring:
Lt Col William David “Fuzzy” Wells, Ph.D. (USAF)

STATS
Year graduated from MOVES: 2005  
Thesis: Generating enhanced natural environments and terrain for interactive combat simulations (GENETICS).

Current Job Title and Duty Station:  
USAF Chief Scientist for Research & Development Joint Warfare Analysis Center.

What is unique about the place you are currently stationed? I am currently stationed at the Joint Warfare Analysis Center. We have a highly educated civilian workforce (most with advanced degrees and experience in industry) and the typical ratio of operators to academics that you see in most military units has been turned on its head at JWAC. Operators serve as SMEs and LNOs to make sure our products are operationally relevant, but the analysts rule the roost. I’ve never been in an organization that caters so much to the support and professional development of its analysts, scientists, and engineers. One of our central tenets is that JWAC must maintain and enhance its ability to conduct comprehensive analysis. Thus, we have our own JWAC University that regularly offers classes on state-of-the-art analytic techniques and tools, often taught by the developer of the method, framework, or tool in question. The highly classified nature of our work is a daily challenge and greatly restricts how we can interact with others and those within the command itself. Our work isn’t widely known, but it has strategic impacts and requires technical precision. Given those constraints (and lack of marketing), it is notable that JWAC has been honored three times with the Joint Meritorious Unit Award and has twice won the DoD’s award for Outstanding Achievement in Modeling and Simulation.

What are you working on and how does it relate to Modeling & Simulation? JWAC provides combatant commands, Joint Staff and other customers with responsive, effects-based, precision-targeting options for selected networks and nodes in order to carry out national security and military strategies of the United States during peace, crisis and war. We develop and adapt modeling and simulation technologies for analysis, computation, and the presentation of responsive options to our customers through partnerships with technology centers of excellence within DoD, academia, and industry.

We solve these complex challenges using social and physical science techniques and engineering expertise. Our social scientists, engineers, and support personnel build, advance, and apply modeling and methodologies to our holistic approach of problem-solving. Our tradition is that of accurate and effective technical solutions and our future will be characterized by even greater speed and fidelity.

What aspects do you particularly enjoy about your job? As Chief Scientist of Research and Development, I am tasked with using our R&D resources to prepare our analysts to solve the problems of 2014 and beyond. I have the responsibility to shape and execute the R&D plan for the command. I provide technical oversight of the command’s R&D projects, ensure they are operationally relevant, and vectored towards accomplishing the commander’s strategic guidance. To this end, I am given the freedom to visit external entities to discover the latest technology and research efforts to help push JWAC’s analytic capability forward.

Any advice for current MOVES students? Make good strategic choices in forming your committee. Think through the cost-benefit of adding each member. They will serve as your mentors for a year or more. Make sure to conduct due diligence in finding out about their availability and ability to guide students. Great teachers, researchers, leaders, or role models do not necessarily correlate to great mentors, especially if their schedule is packed. I was very fortunate in my selection, but I know many have struggled or stalled due to a lack of guidance at a critical point in their research. So choose wisely. As you start to settle into a research group, make sure to gain and maintain awareness of other research happenings within and outside of MOVES. Even “competing” efforts can be mined for good ideas or used as a comparison or deviation point and hopefully your work will benefit someone else’s research. At the end of the day, we should all be working together to move the ball further down the field. And if you can, take Naval Command & Staff while you’re here at NPS. And read up on Hamming. And don’t break ribs (twice) playing soccer. Most importantly, enjoy Monterey and all it has to offer!

How has receiving a Ph.D. in M&S impacted your career? Getting a MOVES Ph.D. was a highpoint in my career and a defining characteristic for my follow-on assignments. After graduation, I became an assistant professor at the U.S. Air Force Academy, teaching operations research, computer science, and modeling & simulation. I ran the OR program, added combat modeling and agent-based simulation to the curriculum, defined ABET criteria for
Busy and exciting times at MOVES as we all prepare for the Research and Education Summit 12-14 July here in Monterey. A few notable highlights from my perspective:

First, I’d like to thank MOVES alumni, faculty, staff and students for making our recent first ever student simulation exercise so successful. During the NPS Enrichment week (e-week), MOVES alumni Maj Eric Whittington (USMC) visited MOVES with several of his colleagues and support staff to demo Marine Air-Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS) training technology and support student thesis research. This visit and the coordinated exercises conducted over the course of several days in MOVES classrooms and labs took important steps forward in improving education opportunities, exploring new research domains and enriching the corporate knowledge base within MOVES. We hope to use these efforts as the model and base to improve the education and research opportunities available to students and faculty. On the faculty side, Curt Blais, John Falby, and Jimmy Liberato were extremely resourceful in guiding the project.

I’d also like to thank Dr. Joe Lopreiato, Associate Dean for Simulation Education, Uniformed Services University of the Health Sciences, and his team at the National Capital Area Medical Simulation Center. They hosted an exceptionally rewarding and productive meeting in Bethesda, MD in mid-March. They are producing impressive work on a broad spectrum in the areas of clinical skills, part-task, screen-based exercise scale simulation.

The work underway at USU is at the leading edge of modeling, virtual environment and simulation technology. This promises to be an exciting and challenging arena for both organizations. MOVES faculty Mathias Kölsch, Mike McCauley and Quinn Kennedy (as well as many others), have been instrumental in their initiative investigation of how M&S education may help accelerate NCAMSC efforts to improve quality, reliability and affordability of education for health care professionals.

Will ONR-sponsored MMOWGLI revolutionize how the Navy innovates? As cited on the front page of the newsletter, the MMOWGLI project, spearheaded by MOVES Associate Professor Don Brutzman, is gaining much traction. Please visit: http://mmowgli.nps.edu/mmowgli to read more and pre-register to play the game.

At the end of February, MOVES hosted a workshop to collect data from subject matter experts (SMEs) in the field of emergency response. Specifically, the session was held to discuss the plan for an upcoming tabletop exercise to be held in Long Beach, wherein SMEs will be asked to respond to a radiological dispersal scenario. Warm thanks to EADS partner Geoff Williams and Mike Lincoln from the University of Edinburgh for their outstanding efforts. The use of their Instrumented Meeting Room developmental technology was truly impressive and we’re confident will lead to ever-more-impressive applications. Thanks also to the newest member of MOVES, Wendy Walsh. Wendy brings extensive experience in the domain of homeland security and has delivered outstanding efforts in her role as co-principal investigator. Thanks again to the nine homeland security professionals representing State, Federal and Local agencies who took time from their busy schedules and made the event a reality. More information about the ROGUEVIDEO workshop can be found on page 4.

If you know anyone who would benefit from an M&S Management Certificate, please alert them of the following program within MOVES: http://www.movesinstitute.org/docs/MS_CertBroch_MOVES.pdf.

For additional questions about the M&S Management Certificate, please contact Academic Chair, Mathias Kölsch.

Where Are They Now? Continued...

OR, and built the first OR lab/classroom; trying in a small way to replicate at USAFA the environments I had seen at MOVES and at West Point’s ORCEN (run at the time by fellow MOVES Ph.D., COL Simon Goerger). From the Academy I deployed for a year to Air Force Central Command’s Combined Air & Space Operations Center at Al Udeid Air Base, Southwest Asia as the lead analyst to the Combined Forces Air Component Commander where my Ph.D. acted as my “Weapons School patch” giving me and my analysts a measure of credibility to senior military leaders in providing recommendations about how to conduct air operations in Iraq and Afghanistan. After my deployment, I was thrilled to be offered the position of Senior Modeler at the Joint Warfare Analysis Center that rapidly changed to Chief Scientist for Research and Development that has me directing the R&D agenda for an organization filled with expert scientists and engineers. Like NPS, it’s an honor and a privilege... and definitely a full-throttle learning experience.

LtCol Fuzzy Wells can be reached at: wwells@jwac.mil

Career Opportunities with MOVES

Be sure to check the MOVES website for current openings:

http://www.movesinstitute.org/about_career.html

Now Hiring:

* Simulation Programmer*
* Full time faculty Research Associate Professor*
* Full time research faculty Assistant Professor*
* Delta3D Lead Programmer*
* Delta3D Technical Artist*
* Software Engineer/Programmer*

http://www.movesinstitute.org/about_career.html
The Delta3D Download By: Erik Johnson

The Delta3D Download is a regularly scheduled column featuring current news about Delta3D, the MOVES Institute’s open source engine for serious games. The Delta3D team’s rich experience in the video game industry, visual simulation, and the military is the optimal mix for creating engaging and effective military training games.

The start of a new year signals a good time to reflect on the past and define the future. Delta3D at the MOVES Institute had another exciting and productive year. For almost a decade, the Delta3D team at MOVES has been creating interesting applications to test, train, and entertain.

In 2010, the Delta3D team worked in areas such as networking, scenario scripting, audio, physics, character animation, and artificial intelligence. Graduates received degrees utilizing Delta3D in their research; awards were won for published papers on game-based techniques; numerous open source conferences were attended.

Recent work has begun on developing a counter-piracy application to help train and test Commanding Officers handle maritime piracy incidents. This project, along with an immersive cultural experience application, is helping develop more scenario editing capabilities to Delta3D.

This year, Delta3D at MOVES will continue to be a strong player in the serious games arena. Portions of Delta3D are planned to be redesigned which will allow the end developers greater flexibility in developing their applications.

Flexibility, performance, and robustness are the key areas this year which will allow Delta3D to remain “the open source engine for serious games.”

To learn more about Delta3D, please visit: www.delta3d.org
Or contact the Delta3D Technical Director, Erik Johnson: rejohnso@nps.edu

HSEEP Data Collection Workshop at MOVES Bringing Together Subject Matter Experts to Address Disaster Relief Protocol

Emergency response operational systems often do not work ‘as expected’ by users. Subject matter expertise is not always considered for system design when developing the system requirements, and interagency coordination is often absent. With the Real-time Online Game-based Use-case Engine for Validation of Interagency Doctrine in Emergency Operations (ROGUEVIDEO) project we are attempting to build a bridge between operational environments and synthetic environments. The ROGUEVIDEO project is the result of a partnership between the European Aeronautic Defence and Space (EADS) Company and the Modeling, Virtual Environments, and Simulation (MOVES) Institute at the Naval Postgraduate School in Monterey, California. The ROGUEVIDEO is committed to building every element of the system in an open source environment to facilitate free sharing across all jurisdictions. Our current project goal is to create a web-based framework populated with relevant plans, doctrine, equipment and subject matter expertise. To focus this effort we are using a radiological dispersal scenario in the Long Beach, California jurisdiction. This will establish the groundwork to address all fifteen U.S. Department of Homeland Security (DHS) National Planning Scenarios.

The ROGUEVIDEO approach is to capture subject matter expert (SME)-validated doctrine, plans, procedures, equipment, decision making and systems in an architectural framework, then build a transfer mechanism from the architectural framework to an open source synthetic environment. The integrity of the SME input will result in more relevant and accurate simulations to better prepare global emergency responders.

To test this approach, we held an HSEEP (Homeland Security Exercise and Evaluation Program) Data Collection Workshop at the MOVES Institute on 24 February 2011. This served as our first step toward collecting SME input to inform development of the synthetic environment. By the HSEEP definition, this initial workshop was truly a hybrid of a traditional seminar and workshop, designed to acquaint participants with the ROGUEVIDEO project and approach before we move to the next step of discussing the plan or way ahead for using a table top exercise (TTX) to elicit SME data inputs.

The TTX will validate and highlight successes of symbiotic doctrine; tactics, techniques and procedures (TTPs); standard operating procedures (SOPs); and equipment use, as well as surface interagency gaps related to National Planning Scenario 11, a radiological dispersal event. The information from this TTX will be used to inform software which will provide a visual and interactive interagency doctrine validation experience potentially applicable to all fifteen U.S. DHS national planning scenarios. The TTX is being planned for August in the vicinity of Long Beach.

For further information about this project, please contact Wendy Walsh, wdwalsh@nps.edu.
The S1000D International Specification for Technical Publications Utilizing a Common Source Database was developed in the 1980s for civil aviation by the AeroSpace and Defence Industries Association of Europe (ASD). With the growth of Integrated Logistics Support (ILS) and Information Technology (IT), the European aviation industry developed a structured approach for documentation of air vehicle projects, resulting in S1000D. The most recent version, Issue 4.0.1, was released in 2009 and was jointly produced by ASD, the Aerospace Industries Association (AIA), and the Air Transport Association of America (ATA). In moving from Issue 3.0 to 4.0 (Issue 4.0.1, May 12, 2009), the specification extended beyond technical data to include support for learning, training and human performance content. This version also included a number of changes submitted by the U.S. Army. The S1000D suite of information includes the technical publications specification, examples (e.g., XML instance documents, PDF files, and style sheets), XML schemas, and any other software or information under the heading “S1000D suite of information” on the pages titled “S1000D On-line” and “Download” on the website http://www.s1000d.org. S1000D maintenance and evolution is governed by the S1000D Council and the S1000D Steering Committee made up from members of defense organizations and industry.

In 2008, AIA submitted a recommendation to the DoD to declare the S1000D standard to be the preferred specification for technical documentation in all DoD acquisitions. In response to that recommendation, OUSD engaged LMI (originally, the Logistics Management Institute) to assess the merits of the AIA recommendation to require the use of S1000D. That study recommended that the decision about whether to require S1000D should be deferred until several enterprise-level issues are resolved. After the passage of two years, during which the use of S1000D grew significantly in DoD and a new version of S1000D (Issue 4.0) was released, OUSD (P&R) decided to revisit the issue of whether S1000D should become the required standard for technical publication and to support integration of training and technical data. That question was the impetus for the analysis early this year by NPS.

To answer the question about whether DoD should require the use of S1000D, we pursued three main approaches: (1) review and analysis of documentation; (2) structured interviews with individuals knowledgeable and experienced in the use of S1000D; (3) and a survey questionnaire. The document review fed into generation of questions for the structured interviews, and both the document review and the interviews contributed to the content of the questionnaire. Prior to recruiting interviewees or participants for the survey, the project investigators obtained NPS Institutional Review Board (IRB) approval for the conduct of human subject research in accordance with Department of the Navy Human Research Protection Program policies and procedures.

Based on the information and opinions gathered from nearly 200 participants in the study, we concluded that S1000D should be a required standard for technical publications across the DoD. This action should be taken in conjunction with a program to implement, transition, and promote its success. This program would include a set of critical provisions for DoD to: (1) manage/govern the use of the standard; (2) promote the use of the standard; (3) support adoption and evolution of the standard; and (4) establish and enforce use of the standard. Specifically, we recommended the following:

- Require the use of S1000D for new acquisitions unless the business case clearly shows otherwise (e.g., possibly in the case of a very small, one-off item).
- Require the use of S1000D for legacy systems only when a business case (cost-benefit analysis) supports its use for a specific program or system.
- Establish a DoD Technical Information Governance Office to provide top-level, enterprise-wide leadership and guidance for technical publications and technical data across acquisition, logistics, maintenance, training, and other relevant endeavors. This enterprise-level view should include evaluation of the full S-Series family of specifications with a vision toward fully integrated technical data across the system lifecycle.
- Actively participate in the S1000D governing organizations to act as a proponent for the technical and business interests of DoD agencies, organizations, and component services. Applicable S1000D organizations include the S1000D Defense Working Group, the S1000D Steering Committee, the S1000D Council, and the Joint Service IETM Technology Working Group.
- Develop a plan for transition and introduction of S1000D across the DoD including responsibility for training acquisition personnel and program managers in the S1000D standard.
- Develop Department-level business rules and coordinate creation of layered business rules across the Services and DoD agencies and organizations.
- Monitor, evaluate, and establish requirements, as necessary, to ensure compatibility of commercial and open source tools for production of S1000D-compliant publications and courses among the Services, organizations, programs, and systems using the standard.
- Make the financial commitment to support the transition to the use of the S1000D standard throughout the DoD. Supportive efforts should

(Continued on page 6)
include assisting in cost benefit analyses, training and education of acquisition and management personnel, and guidance for legacy conversion (in cases when such conversion is deemed beneficial).

- Require S1000D format for all interchange, reuse, and storage of technical publication data and technical training content, while allowing and encouraging innovation in different approaches (formats, tools, etc.) at the authoring level.

The report has generated great interest in DoD. We are watching carefully to see if the findings influence the direction DoD chooses to go in this important area of standardization.


Dr. Robert Wisher, a Research Professor at the MOVES Institute, co-edited a book on Advanced Distributed Learning entitled Learning on Demand: ADL and the Future of e-Learning. Bob served as Director of the ADL Initiative from 2002 until 2009 while working for the Office of the Secretary of Defense, Readiness and Training Directorate. Launched in 1997, ADL incorporates into practice the proven benefits of technology-based instruction, providing access to high quality education, training, and job support, tailored to individual needs, and delivered on demand, anytime and anywhere. This volume tells the ADL story from 1997 to 2009 in 26 chapters, with contributions from those who actively engaged in the Initiative. Because of its strategy of openness, collaboration, and partnerships, ADL has attracted significant attention from academic, corporate, government and technology arenas.

For additional information on the book, including copies of individual chapters, contact Dr. Wisher directly at rawisher@nps.edu.

**Awards & Accomplishments**

MOVES faculty and students strive to deliver exemplary research. Their efforts do not go unnoticed. Here we highlight a few of the recent accomplishments from members of the MOVES team. To see additional information about these awards, or view more research & event highlights from MOVES, click here: http://www.movesinstitute.org/newsfrommoves.html

National Research Council Fellow, Dr. Ji Hyun Yang won the prestigious award for the best paper published annually in IEEE Transactions on Systems, Man, and Cybernetics.

LT Rob Zaborowski, USN, received the competitive SPAWAR fellowship for his work in Aerial Detection of Rigid and Articulated Objects Using UAV Visual Imagery. Assistant Professor Mathias Kolsch, MOVES Institute and CS, is serving as faculty advisor.

CDR Sullivan was awarded the Meritorious Service Medal for his "outstanding leadership, proclivity for action, and selfless dedication to the MOVES Institute." The acknowledgement comes from NPS Senior Leadership and President Obama.


Several members of multi-institutional project team BASE-IT visited USMC base Camp Pendleton. They met with the personnel in charge of the training on Kilo 2, a physical range for training of urban warfare operations. This and similar training ranges have been a central focus of BASE-IT project work; the researchers design and prototype a new generation of instrumented training ranges, with fully automated sensor system, including a collection of the training data, automatic recognition of the operations exhibited on the range as well as automated performance evaluation of individuals and teams that took part in the training run. During the same week Dr. Sadagic also executed a user study - a validation of behavioral models developed in BASE-IT project, with the active duty Marines from the base as volunteer subjects in the study. BASE-IT Institutions: NPS/MOVES (lead lab), SRI International Sarnoff, and University of North Carolina at Chapel Hill.

**BASE-IT Visit to Camp Pendleton**

**Pictured Standing:** Christopher Getchell (USMC/TSC), Daniel Mobley (USMC/TSC), Matthew Denney (USMC/PM TRASYS), Dr. Greg Welch (UNC), Herman Towlles (UNC)  
**1st row:** Dr. Henry Fuchs (UNC), LiCol Albert Wang, Dr. Amelia Sadagic (NPS/MOVES, project PI), DR. Saad Khan (Sarnoff).