

Jennifer Mathieu, Ph.D.

The MITRE Corporation, M/S K308, 202 Burlington Road, Bedford, MA 01730-1420
781-271-8672, 781-271-2352 (F), jmathieu@mitre.org

Education

Cornell University, Biological and Environmental Engineering, Minor Plant Biology, Ph.D. January 2004
University of Hawaii, Biosystems Engineering, Passed Fundamentals of Engineering Exam, M.S. December 1996
Boston University, Double Major Chemistry and Environmental Science, Minor Mathematics, B.A. May 1993

Work Experience

Lead Multi-Discipline Systems Engineer for The MITRE Corporation, Bedford, MA 5/2008-present
Senior Multi-Discipline Systems Engineer for The MITRE Corporation, Bedford, MA 5/2005-5/2008

Postdoctoral Research Associate for Northeastern University, Boston, Massachusetts 1/2004-4/2005
Center for Advanced Microgravity Materials Processing (CAMMP), a NASA-partnership center

Project Coordinator for Ionics Inc., Watertown, Massachusetts
Design, support, and documentation for water treatment systems 2/1997-10/1997

Startup Consultant for Aquaculture Technology Inc., Honolulu, Hawaii
Isolation (HPLC) of antibiotic compounds from marine microalgae 1/1996-7/1996

Research Assistant for the Marine Biological Laboratory, Woods Hole, Massachusetts
Fish and plant collection from eelgrass beds in Buzzard's Bay, Cape Cod
Analysis (GC) of air collected over soil samples 6/1993-8/1993

Experience

The MITRE Corporation (5/05-present)

- Led Social Radar prototyping effort which integrates 10 internal research efforts to show how online and social media sources (at the data scale) can be used to support decision making
- Led Social Network Analysis Reachback Capability project for network effects cell at ISAF included working with university and other partners (CMU, UW, UC Davis, NU, LANL, Milcord) and deployment to Afghanistan
- Research on multi-scale, hybrid modeling of disaster response, healthcare, instability, and program acquisition
- Led impact of cyber threats on mission project, time critical event processing in an operations center
- Tested event reporting application (LocalEyes) at Strong Angel III Disaster Response Demonstration

Northeastern University, Department of Chemical Engineering (1/04-4/05)

- Whole-cell bacterial-based bioluminescent biosensors that are self-calibrating, self-repairing, and able to continuously and accurately quantify volatile organic compound (e.g. toluene, trichloroethylene, ethylene) concentrations in air

Cornell University, Department of Biological and Environmental Engineering (8/97-1/04)

- Early fault or problem detection for NASA's hydroponic crop production systems including mechanistic computer simulation modeling of crop growth, water uptake, and nitrate uptake with extensive experimental work with lettuce crops and sensors, instrumentation, and control in greenhouses

NASA - Kennedy Space Center, Biological Sciences Group, Advanced Life Support Program (10/02-1/03)

- Plant tissue analysis of nitrate, carbohydrates, and organic acids for model validation

University of Tokyo, Department of Environmental and Biological Engineering (10/97-4/99)

- Mechanistic simulation modeling of nitrate uptake

University of Hawaii, Department of Biosystems Engineering (8/93-12/96)

- Aquaculture engineering extension for the state of Hawaii, including teaching a series of aquaculture courses on the six major Hawaiian Islands (target group was native Hawaiians)

Boston University (9/89-5/93)

- Design of innovative high school laboratory experiments involving diffusion controlled processes, including hydroponic root growth in a two-dimensional medium as an example of a fractal

Peer Reviewed Publications, Conference Papers, and Poster Presentations

1. **Mathieu, J., Lorber, M., Ounanian, A., Fulk, M., Troop, J., and Bornmann, B. 2012.** Social Network Analysis Reachback Capability. Applied Human Factors and Ergonomics (AHFE): Cross-Cultural Decision Making (CCDM). San Francisco, 21-25 July 2012.
2. **Mathieu, J., Fulk, M., Lorber, M., Klein, G., and Costa, B. 2012.** "Social Radar Workflows, Dashboards, and Environments." NATO Human Factors and Medicine Panel HFM-201-Specialists Meeting on Social Media: Risks and Opportunities in Military Applications.
3. Hwang, G.M., Mahoney, P.J., James, J.H., Lin, G.C., Keybl, M.A., Berro, A.D., Goedecke, D.M., **Mathieu, J.J., Wilson, T.W. 2012.** A model-based tool to predict the propagation of infectious disease via airports. *Travel Medicine and Infectious Disease* 10, 32-42.
4. **Mathieu, J., Pfaff, M., Klein, G., Drury, J., Geodecke, M., James, J., Mahoney, P., Bobashev, G. 2010.** Tactical Robust Decision-Making Methodology: Effect of Disease Spread Model Fidelity on Option Awareness. ISCRAM 2010.
5. Klein, G.L., Pfaff, M., Drury, J.L., **Mathieu, J.**, James, J., Mahoney, P., More, L. **2009.** Modeling as an Aid to Robust Tactical Decision-Making. 14th International Command and Control Research and Technology Symposium, June 2009, Washington, DC.
6. Wigfield, E., Connolly, K., Alshtein, A., DeArmon, J., Flournoy, R., Hershey, W., James, J., Mahoney, P., **Mathieu, J., Maurer, J., Ostwald, P. 2007.** Mission effectiveness and European airspace: U.S. Air Force CNS/ATM planning for future years. *Journal of Defense Modeling and Simulation*.
7. Chang, W.E., Bauer, D.B., **Mathieu, J., Higgs, B.W., Dileo, J. 2007.** Protein design webservice. Poster Presented. (1) Synthetic Biology 3, 24-26 June, Zurich, Switzerland and (2) 15th Annual International Conference on Intelligent Systems for Molecular Biology (ISMB), July 21-25, Vienna, Austria.
8. **Mathieu, J., James, J., Mahoney, P., Boiney, L., Hubbard, R., White, B. 2007.** Hybrid System Dynamic, Petri Net, and Agent-Based Modeling of the Air and Space Operations Center. INCOSE Symposium, Systems Engineering: Key to Intelligent Enterprises, 24-28 June, San Diego, CA.
9. **Mathieu, J.J., James, J., Melhuish, J., Mahoney, P., Arias-Thode, Y.M., Colosimo, M., Peters, O. 2007.** Multi-scale modeling of bacterial bioremediation. American Society of Agricultural and Biological Engineers (ASABE), June 17-20, Minneapolis, MN, Paper No. 07-2167: 13p.
10. Hoffman, K., Wojcik, L., Bunting, W., Dougherty, F., Love, G., **Mathieu, J., Rahimzadegan, B., Sullivan, W. 2007.** Descriptive enterprise dynamics – A multi-disciplinary unifying framework. Complex Systems Engineering Research (CSER), International Council on Systems Engineering (INCOSE), March 14-16, Hoboken, NJ. <http://www.stevens.edu/ses/cser/>
11. **Mathieu, J., Melhuish, J., James, J., Mahoney, P., Boiney, L., White, B. 2007.** Multi-scale modeling of the Air and Space Operations Center. Symposium on Complex Systems Engineering, The Rand Corporation. <http://cs.calstatela.edu/wiki/images/d/db/White.pdf>
12. **Mathieu, J., Linker, R., Levine, L., Albright, L., Both, A.J., Spanswick, R., Wheeler, R., Wheeler, E., deVilliers, D., Langhans, R. 2006.** Evaluation of the Nicolet Model for Simulation of Short-term Hydroponic Lettuce Growth and Nitrate Uptake. *Biosystems Engineering* 95(3):323-337.
13. **Mathieu, J., Hwang, G., Duniak, J. 2006.** Transferring insights from complex biological systems to the exploitation of netted sensors in Command and Control Enterprises. Command and Control Research and Technology Symposium (CCRTS), June 20-22, San Diego, CA. http://www.dodccrp.org/events/2006_CCRTS/html/papers/127.pdf
14. Wigfield, E., Connolly, K., Alshtein, A., DeArmon, J., Flournoy, R., Hershey, W., James, J., Mahoney, P., **Mathieu, J., Maurer, J., Ostwald, P. 2006.** Mission effectiveness and European Airspace: U.S. Air Force CNS/ATM planning for future years. 11th International Command and Control Research and Technology Symposium (CCRTS), September 26-28, Cambridge, UK. Paper available: http://www.dodccrp.org/events/11th_ICCRTS/html/papers/139.pdf
15. Wigfield, E., Connolly, K., Alshtein, A., DeArmon, J., Flournoy, R., Hershey, W., James, J., Mahoney, P., **Mathieu, J., Maurer, J., Ostwald, P.** CNS/ATM Planning: Modeling USAF and Civilian Air Traffic Interactions in European Airspace. **2006.** 6th Integrated Communications, Navigation, and Surveillance (ICNS) Conference, April 30 - May 3, 2006, Baltimore, MD. Presentation available: <http://gltrs.grc.nasa.gov/reports/2006/CP-2006-214398/11%20Session%20C2/03-Wigfield.pdf>
16. Callahan, Jr., D.M., **Mathieu, J., Applegate, B., Ziemer, K., Bergman, K., Sacco, Jr., A. 2005.** Inhibition of bioluminescent gene expression in whole-cell bacterial biosensors using a high temperature switch. American Institute of Chemical Engineers (AIChE) Poster Competition, 3rd Place.
17. Linker, R., **Mathieu, J., Albright, L. 2005.** A user-friendly, internet-based version of the NiColet simulation model for lettuce. *Acta Horticulturae* (ISHS): 674: 337-342. Model website: <http://www.technion.ac.il/~linkerr/nicolet/>
18. **Mathieu, J., Leed, A., Albright, L. 2004.** A stand-alone light integral controller. *Acta Horticulturae* (ISHS): 633: 153-159.
19. **Mathieu, J.J., Sager, J.C. 2003.** Computer Control System for Kennedy Space Center's New Biological Sciences Research Facility: Space Experiment Research and Processing Laboratory (SERPL). ASAE Paper No. 02-4068: 12p.
20. **Mathieu, J.J., Albright, L.D., 2002.** Evaluation of crop evapotranspiration rates for use in fault detection in hydroponic systems. ASAE Paper No. 02-4043: 10p.
21. **Mathieu, J.J., Albright, L.D., 1999.** Water and nutrient uptake in hydroponic crop production. ASAE Paper No. 99-4122: 11p.
22. **Mathieu, J., Kurata, K., Goto, E., Albright, L. 1999.** A discussion of nutrient uptake equations in hydroponic culture and their use in computer simulation. *Acta Horticulturae* (ISHS) 507: 205-214.
23. **Mathieu, J., Albright, L., Goto, E., Kurata, K., 1998.** Whole crop model of nutrient uptake within a recirculating hydroponics system: A literature review. In: Proceedings of the 1998 Joint Meeting of the Society of Agricultural Meteorology of Japan (SAMJ), the Japanese Society of Environmental Control in Biology (JSECB), and the Society of Agricultural Structures, Japan (SASJ): 210-211.
24. **Mathieu, J.J., Wang, J.-K., 1995.** The effect of water velocity and nutrient concentration on plant nutrient uptake: A literature review. In: Aquacultural Engineering and Waste Management: 187-211.