

Jeremy Bolton

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Objective: I am seeking a full-time, research position in the area of intelligent systems, pattern recognition and/or image processing.

Education: **Ph.D. in Computer Engineering, Expected December 2008**
Major Advisor: Paul Gader
Thesis Title: Random Set Framework for Context-Based Classification
University of Florida, Gainesville, Florida
Current Graduate GPA of 3.75

Graduate Curricula:

Neural Networks	Computer Vision
Pattern Recognition	Advanced Topics in Computer Vision
Artificial Intelligence	Digital Signal Processing
Bayesian Networks	Linear Programming / Optimization

Bachelor of Science in Computer Engineering, May 2003

Minor in Mathematics

University of Florida, Gainesville, Florida
Graduated Cum Laude
Core GPA of 3.5

Experience: **Research Assistant, January 2003 to Present**
University of Florida, Gainesville, Florida

- *Optimized Multi-Algorithm Systems for Detecting Explosive Objects Using Robust Clustering and Choquet Integration, NSF Program*
June 2008 to Present
 - Developing, implementing and testing context-based methods for target identification in hyperspectral imagery and ground penetrating radar data
 - Developing novel methods for context learning, characterization and identification
- *Ground Standoff Minefield Detection System*
September 2007 to Present
 - Implementing and analyzing algorithms for landmine detection in GPR data
 - Assisting in algorithm transfer of knowledge for production and use in-the-field

- *Science of Land Target Spectral Signatures MURI*
January 2003 to June 2008
 - Researched landmine detection in multiple types of imagery: multispectral, hyperspectral, GPR, ultraSAR
 - Developed robust algorithms for landmine detection and multi-sensor / multi-feature fusion using innovative mathematical and statistical techniques
 - Implemented and analyzed algorithms that rely on physical signatures, qualitative knowledge derived from physical modeling
 - Provided feedback to physical modelers and colleagues: Georgia Tech, University of Hawaii, University of Maryland, Rochester Institute of Technology
- *Wide Area Airborne Minefield Detection (WAAMD)*
January 2004 to December 2006
 - Worked with WAAMD Program including Army Research Labs (ARL), NVESD, Raytheon, General Dynamics, Technical Research Associates (TRA)
 - Developed, implemented and analyzed algorithms for landmine detection
 - Provided a fusion infrastructure for multi-sensor / multi-feature data fusion

Software Developer Intern, August 2002 to June 2003
Dell Corporation, Austin, Texas

- *Integrated Process and Product Design (IPPD)*
August 2002 to June 2003
 - Developed an I2C debug board along with software interface
 - Assisted in development and testing of software interface
 - Composed instruction manual of I2C debug tool

Publications: Full Refereed Journal Papers

- **J. Bolton** and P. Gader, "The Benefits of Context Estimation Using the Random Set Framework for Target Spectra Detection in Hyperspectral Imagery," *IEEE Transactions on Geoscience and Remote Sensing*, Submitted.
- **J. Bolton**, P. Gader and J. Wilson, "Discrete Choquet Integral as a Distance Metric," *IEEE Transactions on Fuzzy Systems*, Vol. 14, No. 4, pp. 1007-1110, August 2008.
- A. Zare, **J. Bolton**, P. Gader and M. Schatten, "Vegetation Mapping for Landmine Detection Using Long Wave Hyperspectral Imagery," *IEEE Transactions on Geoscience and Remote Sensing*, Vol. 46, No. 1, pp. 172-178, January 2008.

Refereed Conference Papers

- **J. Bolton** and P. Gader, "Random Set Model for Context-Based Classification," *IEEE World Congress on Computational Intelligence*, Hong Kong, June 2008. In Press.

- **J. Bolton** and P. Gader, "The Benefits of Context Estimation for Target Spectra Detection in Hyperspectral Imagery", *Proceedings of IEEE Geoscience and Remote Sensing*, Boston, July 2008, In Press.
- **J. Bolton** and P. Gader, "Application of Context-Based Classifier to Hyperspectral Imagery for Mine Detection," *Proceedings of SPIE Defense and Security*, Vol. 6952, 693519, Orlando, March 2008.
- **J. Bolton** and P. Gader, "Application of Random Set Based Clustering to Landmine Detection with Hyperspectral Imagery", *Proceedings of IEEE Geoscience and Remote Sensing*, Barcelona, July 2007, pp. 2022-2025.
- M. A. Schatten, P. Gader, **J. Bolton**, A. Zare, and A. Mendez-Vasquez, "Sensor Fusion for Airborne Landmine Detection", *Proceedings of SPIE*, Vol. 6217, 62172F, May 2006.
- P. Gader, A. Mendez-Vasquez, K. Chamberlin, **J. Bolton**, and A. Zare, "Multi-Sensor and Algorithm Fusion with the Choquet Integral: Applications to Landmine Detection", *Proceedings of IEEE Geoscience and Remote Sensing Symposium*, Vol. 3, pp. 1605-1608, September 2004.

Research

Presentations:

- "The Use of Active Contours for Landmine Detection", Institute of Defense Analyses, Alexandria, VA, May 2008.
- "The Benefits of Context Estimation for Target Spectra Detection in Hyperspectral Imagery", IEEE International Geoscience and Remote Sensing Symposium, Boston, MA, July 2008.
- "Random Set Framework for Context-Based Classification", IEEE World Congress for Computational Intelligence FUZZ, Hong Kong, June 2008.
- "Investigation of Improving Classification of Low Metal Targets", Institute of Defense Analyses, Alexandria, VA, May 2008.
- "Application of Context-Based Classifier to Hyperspectral Imagery for Mine Detection", SPIE Defense and Security Conference, Orlando, March 2008.
- "Context-Based Approach for Mine Detection in Hyperspectral Imagery", Eleventh Annual Army Landmine Detection Research Review Meeting, Springfield, VA, January 2008.
- "Context-Based Approach for Discrimination and Recognition of Disturbed Soil and Subsurface Targets", Army Advanced Workshop Disturbed Soil Characterization and Exploitation, Georgia Tech Research Institute, Atlanta, GA, January 2008.
- "Analysis of HMMs for Targeting IEDs", Institute for Defense Analyses, Alexandria, VA, October 2007.
- "Application of Random Set Based Clustering to Landmine Detection with Hyperspectral Imagery", IEEE International Geoscience and Remote Sensing Symposium, Barcelona, July 2007.
- "Level 1 Evaluation for Wide Area Airborne Minefield Detection", BAE, Alexandria, VA, August 2005.
- "Multi-Sensor Fusion Framework: MURI Internal Review", University of Florida, Gainesville, FL, October 2004.

Research

Activities:

- **Reviewer**, International Geoscience and Remote Sensing Symposium, July 2008.
- **Technical Committee Member**, IEEE World Congress for Computational Intelligence, May 2008.
 - IEEE International Conference on Fuzzy Systems
 - IEEE International Joint Conference on Neural Networks
- **Student Member**, Society of Photographic Instrumentation Engineers, May 2008 - Present.
- **Student Member**, IEEE Geoscience and Remote Sensing Society, March 2008 - Present.
- **Student Member**, IEEE Computation Intelligence Society, January 2008 - Present.
- **Participant**, Army Advanced Workshop Disturbed Soil Characterization and Exploitation, January 2008.
 - Assessed the state-of-the-art
 - Identified Technology Gaps and Barriers
 - Identified Future Research Directions
- **Student Member**, IEEE, 2007 – Present.
- **Reviewer**, Transactions Fuzzy Systems, IEEE, January 2007 – Present.

Awards:

- **Recipient**, University of Florida Computer and Information Sciences and Engineering Department College of Engineering Student Travel Grant, May 2008.
- **Recipient**, University of Florida Graduate Student Council Travel Award, March 2008.
- **Recipient**, University of Florida Office of Research Travel Award, March 2008.