

# ARIEL SCHLAMM

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*Additional contact information and references  
available upon email request*

## EDUCATION

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**Rochester Institute of Technology (RIT)** Rochester, NY, U.S.A.

- **PhD** in Imaging Science, expected Fall 2010 GPA: 3.87/4.0
- **BS** in Imaging and Photographic Technology, 2006 GPA: 3.75/4.0
- Selected Coursework:
  - Imaging Science** Remote Sensing · Digital Image Processing · Linear Systems · Geographic Information Systems · Radiometry · Optics · Spectral Systems · High-Speed Photography · CCD Camera Construction
  - Mathematics** Numerical Linear Algebra · Topology
  - Astronomy** Observational Astronomy · Stellar Astrophysics · Astronomical Imaging

## RESEARCH EXPERIENCE

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*PhD Candidate* (2006-present)

**Digital Imaging and Remote Sensing Laboratory, Center for Imaging Science, RIT**

- **Characterization of the Spectral Distributions of Hyperspectral Imagery for Improved Exploitation**

Widely used methods of target and anomaly detection when applied to spectral imagery provide less than desirable results due to the complex nature of the data. In the case of hyperspectral data, dimension reduction techniques are employed to reduce the amount of data used in the detection algorithms in order to produce “better” and faster results. This essentially ignores a significant amount of collected data that contains relevant information. This research explores using the distribution of collected data in the full  $k$  dimensional hyperspace in order to better understand the phenomenology of hyperspectral imagery and identify regions of “interest” in a hyperspectral scene. Algorithms developed include new methods of dimension estimation, anomaly detection, change detection, and classification. A cueing system to alert an analyst to regions in a hyperspectral image that likely contain “interest” was also developed.

- Funded under a 2007 National Geospatial Intelligence Agency (NGA) University Research Initiative for Improved Dynamic Analysis of Spectral Imagery for Improved Exploitation and focusing in Large Area Search.

*Undergraduate Researcher* (2006)

**Digital Imaging and Remote Sensing Laboratory, Center for Imaging Science, RIT**

- **Characterization of LWIR Hyperspectral Imagery for the Development of Background Bayesian Priors**

Image and non image synthetic data were created to explore the basic phenomenology of background distributions of thermal imagery. Principle component and covariance analysis was used to characterize the background distributions according to varying temperature, material type, water vapor, and sensor altitude.

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***Research Experience for Undergraduates*** (2005)**College of Optics and Photonics, University of Central Florida**

- **Effective Indices of High Contrast Nano- and Microstructures**

The effective indices of high contrast nano- and microstructures were rigorously calculated for TE and TM polarizations over a range of fill factors, grating periods, and substrate indices of refraction. These are diffraction gratings that may be used instead of thin films on an optical material. A variety of approximations and models for calculating the effective indices were implemented. Rigorous coupled-wave analysis was used to determine the actual effective indices in order to determine the accuracy of the approximations.

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**TEACHING EXPERIENCE*****Teaching Assistant*** (2003-2007)**Center for Imaging Science and School of Photographic Arts and Sciences, RIT**

- Teaching assistant duties include grading, lab creation and assistance, lecture duties, and student tutoring.
- **Relevant Classes** · Radiometry · Introduction to Imaging Science · Digital Image Processing · Applied Computing for Imaging · Materials and Processes of Photography · Technical Photography

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**PUBLICATIONS**

1. A.Schlamm, R. Resmini, D.Messinger, and W.Basener, "A comparison study of dimension estimation algorithms," *submitted to Proc. SPIE DS120*, April, 2010.
2. A.Schlamm, D.Messinger, and W.Basener, "A novel method for change detection in spectral imagery," *submitted to Proc. SPIE DS120*, April, 2010.
3. A.Schlamm, D.Messinger, and W.Basener, "Change detection in hyperspectral image tiles based on quantitative measures of point density," *submitted for approval*, September 2009.
4. A.Schlamm, D.Messinger, and W.Basener, "Geometric estimation of the inherent dimensionality of a single and multi-material clusters hyperspectral imagery," *JARS* **3**, 033527 (April 2009) [doi:10.1117/1.3133323].
5. A.Schlamm, D.Messinger, and W.Basener, "Effect of manmade pixels on the inherent dimension of natural material distributions," *Proc. SPIE* **7334**, April 2009 [doi:10.1117/12.816568].
6. A.Schlamm, D.Messinger, and W.Basener, "Geometric estimation of the inherent dimensionality of a single material cluster in multi- and hyperspectral imagery," *Proc. SPIE* **6966**, 69661G (2008) [doi:10.1117/12.776903].

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**PRESENTATIONS**

My research has been presented at the following classified and unclassified conferences:

- NGA Academic Research Program (NARP) Symposium - 2008, 2009
- Spectral Analyst Exchange Forum (SAEF) - 2009
- ENVI User Symposium - 2008, 2009
- SPIE Defense, Security, and Sensing - 2008, 2009, 2010
- Undergraduate Research Symposium - Rochester Institute of Technology, July 2006

## SKILLS

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- Proficient in ENVI/IDL tool development
- Familiarity with Mac OS X, UNIX, Windows, L<sup>A</sup>T<sub>E</sub>X, IDRISI, MATLAB

## HONORS AND ACTIVITIES

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- College of Science Representative on Graduate Student Advisory Committee to the Dean of Graduate Studies (2008-present)
- Graduate Student Representative to the RIT Board of Trustees (2008-present)
- Co-Coordinator of the RIT Annual Graduate Research Symposium (2009)
- President of RIT SPIE Student Chapter (2004-2006)
- Student Member of SPIE and ASPRS
- Assistant Volunteer Coordinator and Assistant Web Content Coordinator of All Bassets Cherished (ABC) Basset Hound Rescue of New York