Kirill Trapeznikov

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citizenship: U.S. citizen

Objective

A research engineer position in an exciting multi-disciplinary environment.

Areas of Specialization

- *Machine Learning:* supervised, semi-supervised and unsupervised algorithms, robust classification, cost sensitive learning, feature extraction and dimensionality reduction
- *Optimization Methods:* convex, non-convex, online
- *Statistical Signal Processing:* recursive estimation, image reconstruction, inverse problems, basic computer vision

Software Skills: MATLAB (MEX interface), C/C++, LaTeX, Python, Cadence (IC,PCB), Verilog
Other Skills: Knowledge of analog and digital circuit design. Use of engineering lab equipment: spectrum analyzer, oscilloscope, function generator, various soldering tools, basic optical equipment. Personal computer support and repair.

Education

Boston University, Boston, MA
Doctor of Philosophy Candidate, Electrical Engineering **Expected, Spring Semester 2013**
Thesis Title: "Cost Sensitive Learning During Training and Testing."
Master of Science, Electrical Engineering. GPA: 3.95/4.00 **December 2010**
Bachelor of Science, Electrical Engineering. GPA: 3.86/4.00 **December 2006**

Research and Professional Experience

Dept. of Electrical and Computer Engineering, Boston University, Boston, MA
Graduate Research Assistant, Information Sciences and Systems Lab **September 2008 - Present**
Research in machine learning and statistical signal processing, theory and methods:

- Active learning, boosting methods, multi-stage classification systems, budget constrained classification.
- Applications to explosive detection systems as part of DHS research center on Awareness and Localization of Explosive Related Threats.

Research Advisors: Venkatesh Saligrama, David Castañón.

Sandia National Laboratories, Solar Technologies, Albuquerque, NM
Graduate Technical Intern **Summers: 2008, 2009; Part-time: 2010 - 2012**
Work on concentrated solar power dish systems:

- Automated mirror facet alignment and surface characterization using fringe reflection techniques. Development and implementation of algorithms and GUI in MATLAB and C.
- Circuit design and PCB layout for a heat engine simulator system

Biomimetic Systems, Cambridge, MA
Technical Intern **Summer 2006**
Validation and testing of hardware and algorithms for an acoustic direction finder system (gunshot localization).

Selected Publications

- K. Trapeznikov, V. Saligrama, D. Castañón. "Supervised Sequential Classification Under Budget Constraints", *Int. Conf. on Artificial Intell. and Stats.*, April 2013, (oral, 10% acceptance rate)
- K. Trapeznikov, V. Saligrama, D. Castañón. "Multi-Stage Classifier Design", *Asian Conf. on Machine Learning*, November 2012, (oral); (invited submission to) *Machine Learning Journal.*

- K. Trapeznikov, V. Saligrama, D. Castañón. Two Stage Decision System,*IEEE Stochastic Signal Processing Workshop*, August 2012
- K. Trapeznikov, V. Saligrama, D. Castañón. "ActBoost: Active Boosted Learning", *Int. Conf. on Artificial Intell. and Stats.*, April 2011.
- C.E. Andraka, J. Yellowhair, K. Trapeznikov, J. Carlson., B. Myer, K. Hunt. "AIMFAST: An Alignment Tool Based On Fringe Reflection Methods Applied To Dish Concentrators", *J. Solar. Energy Eng 2011.*
- C.E. Andraka, S. Sadlon, B. Myer, K. Trapeznikov, C. Liebner. "Rapid Reflective Facet Characterization Using Fringe Reflection Techniques", *ASME Energy Sustainability 2009*, July 2009.

Invited Talks

- Supervised Sequential Classification Under Budget Constraints, Graduation Day Talk, *Information Theory and Applications Workshop*, San Diego, 2013
- Multi-Stage Decision System, *8th Algorithm Development for Security Applications Workshop*, Boston, 2012

Workshop Organization

- Organizer: Int. Conf. on Machine Learning 2013 Workshop on Machine Learning with Test-time budgets

Poster Presentations

- Sequential Decision System Design, *Workshop on Multi-Trade Offs in Machine Learning*, *Conference on Neural Information Processing Systems*, Lake Tahoe, Nevada, 2012
- Multi-Stage Classifier Design, *Research and Industrial Collaboration Conference (RICC), at Awareness and Localization of Explosive Related Threats (ALERT) DHS Center of Excellence*, October, Boston, 2011
- Active Boosted Learning, *Boston University Science Day*, 2011
- Active Boosted Learning, *Research and Industrial Collaboration Conference (RICC), at Awareness and Localization of Explosive Related Threats (ALERT) DHS Center of Excellence, October*, Boston, 2010

Related Coursework

Statistical Pattern Recognition, Optimal Filtering and Recursive Estimation, Linear and Non-Linear Optimization, Image Reconstruction and Restoration, Information Theory, Stochastic Signals and Systems, Wireless Communications, Analog and Digital VLSI Circuit Design, Introduction to Photonics