

# Gregory Shakhnarovich

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Updated: March 2009

## RESEARCH

### INTERESTS

- ◇ **Computer vision**, in particular automatic categorization and parameter estimation for visual objects, recovery of 3D information from images and video, and articulated tracking.
- ◇ **Machine learning**, in particular example-based methods and dynamical models.
- ◇ **Brain-machine interfaces**, in particular neural decoding and neuro-motor prosthetics.

## EDUCATION

- ◇ **Massachusetts Institute of Technology**, Cambridge, MA.  
Ph.D. in Computer Science, 2005.  
Dissertation topic: *Learning Task-Specific Similarity*.  
Advisor: Prof Trevor Darrell.
- ◇ **Technion–Israel Institute of Technology**, Haifa, Israel.  
M.Sc. (cum laude) in Computer Science, 2001.  
Thesis title: *Smoothed Bootstrap and Statistical Data Cloning for Classifier Evaluation*.  
Advisors: Prof. Yoram Baram, Dr. Ran El-Yaniv.
- ◇ **Hebrew University**, Jerusalem, Israel.  
B.Sc. (cum laude) in Mathematics and Computer Science, 1994.

## APPOINTMENTS

- ◇ **Assistant Professor**, Toyota Technological Institute at Chicago, since February 2008.
- ◇ **Visiting Scientist**, Weizmann Institute of Science, December 2008–January 2009
- ◇ **Postdoctoral Research Associate**, Department of Computer Science, Brown University, October 2005–2008. Research topics: brain-machine interfaces, neural decoding of motor commands, analysis of recorded neural activity.
- ◇ **Research Assistant**, Computer Science and Artificial Intelligence Laboratory, MIT, 2000–2005. Research topics: statistical machine learning, human identification with face and gait, human pose estimation and articulated tracking, object classification.

- ◇ **Research Intern**, Mitsubishi Electric Research Lab, Summer 2002 & 2003. Developed and implemented machine learning algorithms for example-based estimation of articulated hand pose from multiple views, and algorithms for gender and ethnicity classification from face imagery.

## TEACHING

- ◇ **Instructor**, *Introduction to Machine Learning*, Brown University (Fall 2006). Designed a core machine learning course, taught to a mixed senior undergraduate and graduate audience; prepared and taught lectures, created problem sets and exams and supervised two graduate TAs.
- ◇ **Teaching Assistant**, *Machine Learning*, MIT (Fall 2002) Prepared and taught weekly recitations, created problem sets and exams.
- ◇ **Teaching Assistant**, Technion (1998-2000) Courses: *Introduction to Computer Science*, *Introduction to Systems Programming*, *Pattern Recognition and Data Mining*. Prepared and taught weekly recitations, created problem sets and exams.

## PUBLICATIONS

### Peer-reviewed journal and conference papers

- A. Ritz, G. Shakhnarovich, A. R. Salomon, B. J. Raphael, *Discovery of Phosphorylation Motif Mixtures in Phosphoproteomics Data*, Bioinformatics, 2008.
- C. Demiralp, G. Shakhnarovich, S. Zhang, D. H. Laidlaw, *Slicing-based coherence measure for refining clusters of 3D curves*, Proceedings of MICCAI Conference, 2008
- P. K. Artemiadis, G. Shakhnarovich, C. Vargas-Irwin, J. P. Donoghue, M. J. Black, *Decoding grasp aperture from motor-cortical population activity*, Proceedings of IEEE Neural Engineering Conference, 2007.
- G. Shakhnarovich, S.-P. Kim, M. J. Black, *Nonlinear Physically-Based Models for Decoding Motor-Cortical Population Activity*, Neural Information Processing Systems, 2006.
- N. Srebro, G. Shakhnarovich, S. T. Roweis, *An Investigation of Computational and Informational Limits in Gaussian Mixture Clustering*, Proceedings of International Conference on Machine Learning, 2006.
- L. Taycher, G. Shakhnarovich, T. Darrell, D. Demirdjian, *Conditional Random People: Tracking Humans with CRFs and Grid Filters*, Proceedings IEEE Conf. on Computer Vision and Pattern Recognition, 2006.
- D. Demirdjian, L. Taycher, G. Shakhnarovich, T. Darell, *Avoiding the Street-light Effect: Tracking by Exploring Likelihood Modes*, Proceedings of the International Conference on Computer Vision, 2005.
- L. Ren, G. Shakhnarovich, J. Hodgins, H. Pfister, P. Viola, *Learning Silhouette Features for Control of Human Motion*, ACM Transactions on Graphics, 2005.
- K. Grauman, G. Shakhnarovich, T. Darrell, *Virtual Visual Hulls: Example-Based 3D Shape Inference from a Single Silhouette*, Proceedings of the 2nd Workshop on Statistical Methods in Video Processing, 2004.

K. Grauman, G. Shakhnarovich, T. Darrell, *A Bayesian Approach to Image-Based Visual Hull Reconstruction*, Proceedings IEEE Conf. on Computer Vision and Pattern Recognition, 2003.

K. Grauman, G. Shakhnarovich, T. Darrell, *Inferring 3D Structure with a Statistical Image-Based Shape Model*, Proceedings of the International Conference on Computer Vision, 2003.

G. Shakhnarovich, P. Viola, T. Darrell, *Fast Pose Estimation with Parameter Sensitive Hashing*, Proceedings of the International Conference on Computer Vision, 2003.

G. Shakhnarovich, P. A. Viola, B. Moghaddam, *A Unified Learning Framework for Real Time Face Detection and Classification*, Proceedings of the Int. Conf. on Automatic Face and Gesture Recognition, 2002.

G. Shakhnarovich, J. W. Fisher, T. Darrell, *Face recognition from long-term observations*, Proceedings of European Conference on Computer Vision, 2002.

G. Shakhnarovich, T. Darrell, *On Probabilistic Combination of Face and Gait Cues for Identification*, Proceedings of the Int. Conf. on Automatic Face and Gesture Recognition, 2002.

B. Moghaddam, G. Shakhnarovich, *Boosted Dyadic Kernel Discriminants*, Neural Information Processing Systems, 2002.

G. Shakhnarovich, L. Lee, T. Darrell, *Integrated Face and Gait Recognition From Multiple Views*, Proceedings IEEE Conf. on Computer Vision and Pattern Recognition, 2001.

G. Shakhnarovich, R. El-Yaniv, Y. Baram, *Smoothed Bootstrap and Statistical Data Cloning for Classifier Evaluation*. Proceedings of International Conference on Machine Learning, 2001.

#### **Edited volume and book chapters**

G. Shakhnarovich, T. Darrell, P. Indyk, Editors. *Nearest Neighbors in Learning and Vision: Theory and Practice*. MIT Press, 2005.

G. Shakhnarovich, B. Moghaddam, *Face Recognition in Subspaces*, In Handbook of Face Recognition, S. Z. Li and A. K. Jain, Ed. Springer-Verlag, 2004.

#### TALKS AND PRESENTA- TION

- ◇ **Weizmann Institute of Science** Vision and Robotics Seminar, 2002, 2004 and 2009
- ◇ **Hebrew University of Jerusalem** CS Colloquium, 2009
- ◇ **Technion** talk, 2002 and 2009
- ◇ **Society for Neuroscience Annual Meeting**, posters, 2006,2007,2008
- ◇ **ITA** Technical Seminar Series, 2007
- ◇ **Workshop on Advances in Computational Motor Control**, talk, 2006
- ◇ **Learning Workshop at Snowbird**, posters, 2005 and 2006
- ◇ **Gordon Research Conference on Sensory Coding and the Natural Environment**, poster, 2004

- ◇ **Brown University** Pattern Recognition Seminar, 2004
- ◇ **Hebrew University of Jerusalem** Vision Seminar, 2002, 2004
- ◇ **Microsoft Research–Redmond** Vision and Imaging Group, 2003

SERVICE

Program committees: ICCV 2005–2009, ECCV 2006–2008 CVPR 2006–2009, ICML 2007-2009 AI&Statistics 2007, AAAI 2007

Workshop organizer (with T. Darrell, P. Indyk and P. Viola): Nearest neighbor methods in vision and learning, at Neural Information Processing Systems 2003.

Founding organizer of MIT Machine Vision Colloquium (2003-2005).

Reviewer for IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Image Processing, IEEE Transactions on Biomedical Engineering, Neural Information Processing Systems, Image and Vision Computing, International Journal of Computer Vision.

REFERENCES

Available upon request.