Gregory Shakhnarovich

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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.

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

- **Visiting Scientist**, Weizmann Institute of Science, December 2011–February 2012.
- **Visiting Scientist**, Weizmann Institute of Science, December 2010–February 2011.
- **Assistant Professor**, Toyota Technological Institute at Chicago, since February 2008.
- **Assistant Professor, part time**, University of Chicago, Computer Science Department, since April 2009.
- **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 Statistical Machine Learning*, TTIC/University of Chicago (2010–2011), Weizmann Institute of Science (2010–2011).
- ◇ **Instructor**, *Introduction to Computer Vision*, TTIC/University of Chicago (2010).
- ◇ **Instructor**, *Introduction to Machine Learning*, Brown University (2006).
- ◇ **Teaching Assistant**, *Machine Learning*, MIT (2002)

- ◇ **Teaching Assistant**, Technion (1998-2000)
  Courses: *Introduction to Computer Science*, *Introduction to Systems Programming*, *Pattern Recognition and Data Mining*.

Publications

Peer-reviewed journal and conference papers

D. Glasner, M. Galun, S. Alpert, R. Basri, G. Shakhnarovich, *Viewpoint-Aware Object Detection and Pose Estimation*, ICCV 2011.

T. Kim, G. Shakhnarovich, R. Urtasun, *Sparse coding for learning interpretable spatio-temporal primitives*, NIPS 2010.

C. Vargas-Irwin, G. Shakhnarovich, P. Yadollahpour, J. M. K. Mislow, M. J. Black, J. P. Donoghue, *Decoding Complete Reach and Grasp Actions from Local Primary Motor Cortex Populations*, The Journal of Neuroscience, 2010.

A. Ritz, G. Shakhnarovich, A. R. Salomon, B. J. Raphael, *Discovery of Phosphorylation Motif Mixtures in Phosphoproteomics Data*, Bioinformatics, 2009.

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 Streetlight 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.

Recent non-refereed publications and presentations

P. Yadollahpour, D. Batra, G. Shakhnarovich, *M-Best Modes: Diverse M-Best Solutions in MRFs*, Workshop on Discrete Optimization in Machine Learning, NIPS 2011.

D. Batra, G. Shakhnarovich, *Similarity Sensitive Nonlinear Embeddings*, Workshop on Kernels and Distances for Computer Vision, ICCV 2011.

Service

Founding organizer and steering committe member, Midwest Computer Vision Workshop, 2009-present.

Workshop organizer (with D. Batra, B. Kulis and K. Weinberger): Beyond Mahalanobis–Supervised Large-Scale Learning of Similarity, at Neural Information Processing Systems 2011.

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

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

Regular member of program committees: ICCV 2005-present, ECCV 2006-present, CVPR 2006-present, ICML 207-present, NIPS 2005-present, AI&Statistics 2007-present.

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.