

## Svetlana Lazebnik

Assistant Professor  
Department of Computer Science  
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### Research Interests

Visual learning and recognition; browsing, summarization and search of large-scale photo collections; statistical and geometric techniques for visual representation.

### Education

- May 2006     **Ph.D.** in Computer Science  
University of Illinois at Urbana-Champaign  
Advisor: Dr. Jean Ponce  
Dissertation title: *Local, Semi-Local and Global Models for Texture, Object and Scene Recognition*
- Dec. 2002     **M.S.** in Computer Science  
University of Illinois at Urbana-Champaign
- June 2000     **B.S.** in Computer Science with Mathematics Minor (Graduation with Highest Honors)  
DePaul University, Chicago, IL

### Academic Appointments

- January 2012 -             **Assistant Professor**  
Dept. of Computer Science, University of Illinois at Urbana-Champaign
- July 2007 - December 2011     **Assistant Professor**  
Dept. of Computer Science, University of North Carolina at Chapel Hill
- May 2006 - July 2007         **Post-Doctoral Research Associate**  
Dept. of Computer Science, University of Illinois at Urbana-Champaign
- June 2001 - May 2006         **Research Assistant**  
Dept. of Computer Science, University of Illinois at Urbana-Champaign

### Selected Awards

- 2011             DARPA Computer Science Study Group
- 2010, 2007        Outstanding Reviewer Award  
IEEE Computer Society Conference on Computer Vision and Pattern Recognition
- 2009             Microsoft Research Faculty Fellowship
- 2009             NSF CAREER Award
- 2008             Teaching Award  
UNC Department of Computer Science Student Association
- 2008             Junior Faculty Development Award  
University of North Carolina at Chapel Hill
- 2003             David J. Kuck Best Master's Thesis Award  
Dept. of Computer Science, University of Illinois
- 2002             Dave & Jane Liu Award (for exceptional research promise)  
Dept. of Computer Science, University of Illinois
- 2002             Henry Ford II Scholar Award (to an outstanding second-year graduate student)  
College of Engineering, University of Illinois
- 2000 - 2006       Support for Underrepresented Groups in Engineering (SURGE) Fellowship  
College of Engineering, University of Illinois

## Publications

### Journal Articles

- R. Raguram, C. Wu, J.-M. Frahm, and S. Lazebnik, “Modeling and Recognition of Landmark Image Collections Using Iconic Scene Graphs,” *International Journal of Computer Vision*, vol. 95, no. 3, December 2011, pp. 213-239.
- J.-M. Frahm, M. Pollefeys, S. Lazebnik, C. Zach, D. Gallup, B. Clipp, R. Raguram, C. Wu, and T. Johnson, “Fast Robust Large-scale Mapping from Video and Internet Photo Collections,” *ISPRS Journal of Photogrammetry and Remote Sensing*, vol. 65, no. 6 (special issue on 100 years of ISPRS), 2010, pp. 538-549.
- S. Lazebnik and M. Raginsky, “Supervised Learning of Quantizer Codebooks by Information Loss Minimization,” *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 31, no. 7, July 2009, pp. 1294-1309.
- S. Lazebnik, Y. Furukawa, and J. Ponce, “Projective Visual Hulls,” *International Journal of Computer Vision*, vol. 74, no. 2, August 2007, pp. 137-165.
- F. Rothganger, S. Lazebnik, C. Schmid, and J. Ponce, “Segmenting, Modeling, and Matching Video Clips Containing Multiple Moving Objects,” *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 29, no. 3, March 2007, pp. 477-491.
- J. Zhang, M. Marszalek, S. Lazebnik, and C. Schmid, “Local Features and Kernels for Classification of Texture and Object Categories: A Comprehensive Study,” *International Journal of Computer Vision*, vol. 73, no. 2, June 2007, pp. 213-238 – **over 480 citations on Google Scholar**.
- F. Rothganger, S. Lazebnik, C. Schmid, and J. Ponce, “3D Object Modeling and Recognition Using Local Affine-Invariant Image Descriptors and Multi-View Spatial Constraints,” *International Journal of Computer Vision*, vol. 66, no. 3, March 2006, pp. 231-259.
- S. Lazebnik, C. Schmid, and J. Ponce, “A Sparse Texture Representation Using Local Affine Regions,” *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 27, no. 8, August 2005, pp. 1265-1278.
- S. Lazebnik and J. Ponce, “The Local Projective Shape of Smooth Surfaces and Their Outlines,” *International Journal of Computer Vision*, vol. 63, no. 1, June 2005, pp. 65-83.

### Invited Papers and Book Chapters

- J.-M. Frahm, M. Pollefeys, S. Lazebnik, B. Clipp, D. Gallup, R. Raguram, and C. Wu, “Fast Robust Reconstruction of Large-Scale Environments,” *44th Annual Conference on Information Sciences and Systems*, invited session on 3D Data Acquisition and Analysis, 2010, 6 pages.
- S. Lazebnik, C. Schmid, and J. Ponce, “Spatial Pyramid Matching,” *Object Categorization: Computer and Human Vision Perspectives*, S. Dickinson, A. Leonardis, B. Schiele, and M. Tarr (eds.), Cambridge University Press, 2009, pp. 401-415.
- J. Ponce, T. L. Berg, M. Everingham, D. A. Forsyth, M. Hebert, S. Lazebnik, M. Marszalek, C. Schmid, B. C. Russell, A. Torralba, C. K. I. Williams, J. Zhang, and A. Zisserman, “Dataset Issues in Object Recognition,” *Toward Category-Level Object Recognition*, Springer-Verlag Lecture Notes in Computer Science vol. 4170. J. Ponce, M. Hebert, C. Schmid, and A. Zisserman (eds.), 2006, pp. 29-48.
- S. Lazebnik, C. Schmid, and J. Ponce, “A Discriminative Framework for Texture and Object Recognition Using Local Image Features,” *Toward Category-Level Object Recognition*, Springer-Verlag Lecture Notes in Computer Science vol. 4170. J. Ponce, M. Hebert, C. Schmid, and A. Zisserman (eds.), 2006, pp. 423-442.
- F. Rothganger, S. Lazebnik, C. Schmid, and J. Ponce, “3D Object Modeling and Recognition from Photographs and Image Sequences,” *Toward Category-Level Object Recognition*, Springer-Verlag Lecture Notes in Computer Science vol. 4170. J. Ponce, M. Hebert, C. Schmid, and A. Zisserman (eds.), 2006, pp. 105-126.

- C. Schmid, G. Dorko, S. Lazebnik, K. Mikolajczyk, and J. Ponce, “Pattern Recognition with Local Invariant Features,” *Handbook of Pattern Recognition and Computer Vision*, 3rd edition, C.H. Chen and P.S.P Wang (eds.), World Scientific Publishing Co., 2005, pp. 71-92.
- J. Ponce, S. Lazebnik, F. Rothganger, and C. Schmid, “Toward True 3D Object Recognition,” *Congrès de Reconnaissance des Formes et Intelligence Artificielle*, Toulouse, France, January 2004.
- J. Ponce, F. Rothganger, S. Lazebnik, K. McHenry, C. Schmid, S. Mahamud, and M. Hebert, “3D Photography from Photographs and Video Clips,” *Proceedings of the International Symposium on Core Research for Evolutional Science, Technology (CREST) — Ikeuchi Project*, Tokyo, Japan, 2003, pp. 153-182.

### Refereed Conference and Workshop Papers

- J. Tighe and S. Lazebnik, “Understanding Scenes on Many Levels,” *Proceedings of the International Conference on Computer Vision*, 2011.
- M. Pandey and S. Lazebnik, “Scene Recognition and Weakly Supervised Object Localization with Deformable Part-Based Models,” *Proceedings of the International Conference on Computer Vision*, 2011.
- Y. Gong and S. Lazebnik, “Iterative Quantization: A Procrustean Approach to Learning Binary Codes,” *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2011, pp. 817 - 824.
- Y. Gong and S. Lazebnik, “Comparing Data-Dependent and Data-Independent Embeddings for Classification and Ranking of Internet Images,” *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2011, pp. 2633 - 2640.
- J. Tighe and S. Lazebnik, “SuperParsing: Scalable Nonparametric Image Parsing with Superpixels,” *Proceedings of the European Conference on Computer Vision*, 2010.
- J.-M. Frahm, P. Georgel, D. Gallup, T. Johnson, R. Raguram, C. Wu, Y.-H. Jen, E. Dunn, B. Clipp, S. Lazebnik, and M. Pollefeys, “Building Rome on a Cloudless Day,” *Proceedings of the European Conference on Computer Vision*, 2010.
- M. Raginsky and S. Lazebnik, “Locality Sensitive Binary Codes from Shift-Invariant Kernels,” *Advances in Neural Information Processing Systems*, 2009.
- S. Lazebnik and M. Raginsky, “An Empirical Bayes Approach to Contextual Region Classification,” *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2009.
- M. Raginsky, S. Lazebnik, R. Willett, and J. Silva, “Near-Minimax Recursive Density Estimation on the Binary Hypercube,” *Advances in Neural Information Processing Systems*, 2008.
- X. Li, C. Wu, C. Zach, S. Lazebnik, and J.-M. Frahm, “Modeling and Recognition of Landmark Image Collections Using Iconic Scene Graphs,” *Proceedings of the European Conference on Computer Vision*, Marseille, France, October 2008. Springer-Verlag Lecture Notes In Computer Science vol. 5302, pp. 427-440.
- B. Davis and S. Lazebnik, “Analysis of Human Attractiveness Using Manifold Kernel Regression,” *International Conference on Image Processing (special session on aesthetics, mood, and emotion)*, 2008, pp. 109-112.
- R. Raguram and S. Lazebnik, “Computing Iconic Summaries of General Visual Concepts,” *First IEEE Workshop on Internet Vision (in conjunction with CVPR)*, 2008.
- S. Lazebnik and M. Raginsky, “Learning Nearest-Neighbor Quantizers from Labeled Data by Information Loss Minimization,” *Proceedings of the International Conference on Artificial Intelligence and Statistics*, 2007.
- S. Lazebnik, C. Schmid, and J. Ponce, “Beyond Bags of Features: Spatial Pyramid Matching for Recognizing Natural Scene Categories,” *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, New York, June 2006, vol. 2, pp. 2169-2178 – **over 1000 citations on Google Scholar**.
- J. Zhang, M. Marszalek, S. Lazebnik, and C. Schmid, “Local Features and Kernels for Classification of Texture and Object Categories: A Comprehensive Study,” *Beyond Patches Workshop (in conjunction with CVPR)*, 2006.

- M. Raginsky and S. Lazebnik, “Estimation of Intrinsic Dimensionality Using High-Rate Vector Quantization,” *Advances in Neural Information Processing Systems* 18, MIT Press, 2006, pp. 1105-1112.
- S. Lazebnik, C. Schmid, and J. Ponce, “A Maximum Entropy Framework for Part-Based Texture and Object Recognition,” *Proceedings of the IEEE International Conference on Computer Vision*, Beijing, China, October 2005, vol. 1, pp. 832-838.
- S. Lazebnik, C. Schmid, and J. Ponce, “Semi-Local Affine Parts for Object Recognition,” *Proceedings of the British Machine Vision Conference*, Kingston, UK, September 2004, vol. 2, pp. 959-968.
- F. Rothganger, S. Lazebnik, C. Schmid, and J. Ponce, “Segmenting, Modeling, and Matching Video Clips Containing Multiple Moving Objects,” *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, Washington, DC, June 2004, vol. 2, pp. 914-921.
- S. Lazebnik, C. Schmid, and J. Ponce, “Affine-Invariant Local Descriptors and Neighborhood Statistics for Texture Recognition,” *Proceedings of the International Conference on Computer Vision*, Nice, France, October 2003, pp. 649-655.
- S. Lazebnik and J. Ponce, “The Local Projective Shape of Smooth Surfaces and Their Outlines,” *Proceedings of the International Conference on Computer Vision*, Nice, France, October 2003, pp. 83-89.
- S. Lazebnik, C. Schmid, and J. Ponce, “A Sparse Texture Representation Using Affine-Invariant Regions,” *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, Madison, WI, June 2003, Vol. II, pp. 319-324.
- F. Rothganger, S. Lazebnik, C. Schmid, and J. Ponce, “3D Object Modeling and Recognition Using Affine-Invariant Patches and Multi-View Spatial Constraints,” *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, Madison, WI, June 2003, Vol. II, pp. 272-277.
- S. Lazebnik, A. Sethi, C. Schmid, D. Kriegman, J. Ponce, and M. Hebert, “On Pencils of Tangent Planes and the Recognition of Smooth 3D Shapes from Silhouettes,” *Proceedings of the European Conference on Computer Vision*, Copenhagen, Denmark, May 2002. Springer-Verlag Lecture Notes in Computer Science, vol. 2352, pp. 651-665.
- S. Lazebnik, E. Boyer, and J. Ponce, “On Computing Exact Visual Hulls of Solids Bounded by Smooth Surfaces,” *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, Kauai, Hawaii, December 2001, Vol. 1, pp. 156-161.

## Theses

- S. Lazebnik, *Local, Semi-Local and Global Models for Texture, Object and Scene Recognition*, Ph.D. Dissertation, University of Illinois at Urbana-Champaign, May 2006, 172 pages.
- S. Lazebnik, *Projective Visual Hulls*, M.S. Thesis, University of Illinois at Urbana-Champaign, December 2002, 220 pages.

## Oral Presentations

### Invited Talks

- *Modeling and Recognizing the Content of Open-Universe Image Collections*
  - University of Illinois at Urbana-Champaign, June 30, 2011
  - University of Minnesota, February 14, 2011
- *Representing Internet Photo Collections with Iconic Images*
  - ICCV Area Chair Workshop, Kyoto University, June 8, 2009
  - CVPR Area Chair Workshop, Georgia Tech, February 23, 2009
  - Microsoft Research Redmond, June 30, 2008
- *Object and Scene Recognition with Bags of Features and Spatial Pyramids*

- Carnegie Mellon University, May 2, 2007
- Microsoft Research, Redmond, April 16, 2007
- University of California at San Diego, April 9, 2007
- AT&T Research, April 5, 2007
- New York University, April 4, 2007
- State University of New York at Stony Brook, March 14, 2007
- Kodak Research, March 7, 2007
- University of Rochester, March 5, 2007
- Duke University, February 28, 2007
- University of North Carolina at Chapel Hill, February 26, 2007
- *Fun with Nearest-Neighbor Quantizers*
  - Carnegie Mellon University, VASC seminar, October 30, 2006
- *Improving Bag-of-Features Image Classification*
  - ETH Zurich, BIWI group seminar, September 12, 2006
- *Local, Semi-Local and Global Models for Texture, Object and Scene Recognition*
  - University of Washington, April 13, 2006
  - University of Texas at Austin, March 28, 2006
  - Stanford University, March 6, 2006
  - University of Wisconsin at Madison, February 27, 2006
- *Local Image Features for Recognizing Textures, Objects, and Scenes*
  - Toyota Technical Institute, Chicago, February 2, 2006
  - Microsoft Research, Redmond, December 12, 2005
- *From Textons to Parts: Learning Texture and Object Representations Based on Local Image Features*
  - MIT Computer Science and Artificial Intelligence Lab, August 16, 2005
  - Stanford University, March 22, 2005
  - Xerox Research Centre Europe, February 22, 2005
- *Semi-Local Parts and Their Relations for Object Recognition*
  - INRIA Rhône-Alpes, February 21, 2005
- *Learning Local Affine Representations for Texture and Object Recognition*
  - Microsoft Research, Cambridge, September 6, 2004
  - Oxford University Robotics Research Group Seminar, August 31, 2004
  - CalTech Vision Group Seminar, April 13, 2004
- *Texture Recognition Using Affine-Invariant Regions*
  - INRIA Rhône-Alpes, October 23, 2003

### Invited Workshops

- *Understanding Scenes on Many Levels (invited poster)*
  - Workshop on Frontiers in Computer Vision, August 2011
- *Large-Scale Nonparametric Image Parsing*
  - CVPR 2011 Workshop on Large-Scale Learning for Vision, June 20, 2011
- *SuperParsing: Scalable Nonparameteric Parsing with Superpixels (invited poster)*

- Janelia Farm Workshop on Computer Vision and Neuroscience, November 2010
- *Iconic Images*
  - Internet Vision Workshop, Banff, Canada, September 2, 2009
- *Combining Appearance and Geometry for Efficient Scene Recognition*
  - IEEE Workshop on Visual Place Categorization, Miami, Florida, June 21, 2009
- *An Empirical Bayes Approach to Contextual Region Classification*
  - Fourth International Workshop on Object Recognition, Como, Italy, May 16, 2008
- *Exploring Image Data with Quantization-Based Techniques*
  - IPAM Workshop on Numerical Tools and Fast Algorithms for Massive Data Mining, Search Engines and Applications, UCLA, October 25, 2007
- *The Beauty of Local Invariant Features*
  - Third Sicily Workshop on Object Recognition, September 21, 2006
  - Workshop on Visual Learning and Recognition, Institute for Mathematics and Its Applications, University of Minnesota, May 22, 2006
- *A Maximum Entropy Framework for Part-Based Texture and Object Recognition*
  - Snowbird Learning Workshop, April 6, 2005 (poster)
  - Workshop on Visual Recognition/Pattern Classification, Mathematical Sciences Research Institute, Berkeley, March 21, 2005
- *Semi-Local Parts and Their Relations for Object Recognition*
  - Second Sicily Workshop on Object Recognition, October 11, 2004
- *Learning Local Affine Representations for Texture and Object Recognition*
  - Snowbird Learning Workshop, April 8, 2004
- *Texture Recognition Using Affine-Invariant Regions*
  - First Sicily Workshop on Object Recognition, September 10, 2003

## Teaching Experience: University of North Carolina at Chapel Hill

Fall 2011	COMP 590-096: Artificial Intelligence
Spring 2011	COMP 776: Computer Vision
Fall 2010	COMP 590-096: Artificial Intelligence
Spring 2010	COMP 776: Computer Vision
Fall 2009	COMP 875: Machine Learning Methods for Image Analysis
Spring 2009	COMP 776: Computer Vision
Fall 2008	COMP 790-096: Computational Photography
Spring 2008	COMP 776: Computer Vision ( <i>winner of UNC CSSA Teaching Award</i> )
Fall 2007	COMP 790-096: Computer Vision and the Web

## Professional Service and Memberships

- Journal editorial board: International Journal of Computer Vision (since 2009)
- Panels: NSF CISE, 2008, 2009, 2010
- Conference area chair:
  - IEEE Conference on Computer Vision and Pattern Recognition, 2009 and 2011
  - IEEE International Conference on Computer Vision, 2009 and 2011
- Conference session chair: CVPR 2009 and 2011, ICCV 2011

- Conference reviewer:
  - Neural Information Processing Systems, 2006-2010
  - Asian Conference on Computer Vision, 2009
  - International Conference on Machine Learning, 2009
  - European Conference on Computer Vision, 2008, 2010
  - IEEE Conference on Computer Vision and Pattern Recognition, 2006, 2007, 2010
  - International Conference on Artificial Intelligence and Statistics, 2007
- Workshop co-organizer: NIPS 2010 workshop “Beyond Classification: Machine Learning for Next Generation Computer Vision challenges”
- Workshop program committees:
  - ECCV Workshop on Reconstruction and Modeling of Large-Scale 3D Virtual Environments, 2010
  - CVPR Workshop on Advancing Computer Vision with Humans in the Loop, 2010
  - CVPR Joint Workshop on Visual and Contextual Learning, and Visual Scene Analysis, 2009
  - CVPR Workshop on Feature Detectors and Descriptors, 2009
  - International Workshop on Internet Vision, 2008 and 2009
  - International Workshop on Semantic Learning Applications in Multimedia, 2008 and 2009
  - ICCV Workshop on 3D Representation for Recognition, 2007 and 2009
- Journal reviewer:
  - International Journal of Computer Vision
  - IEEE Transactions on Pattern Analysis and Machine Intelligence
  - IEEE Transactions on Image Processing
  - Image and Vision Computing
  - Proceedings of the IEEE
  - Journal of Machine Learning Research
  - International Journal of Robotics Research
  - IEEE Transactions on Systems, Man, and Cybernetics (Part B)
- Member of the Beckman Institute Student and Research Staff Council, 2002-2003
- Member of IEEE (Institute of Electrical and Electronics Engineers) since 1999