Stan Sclaroff

Curriculum Vitae

February 2, 2025

Education:

MIT, Media Laboratory: Ph.D. (1995), S.M. (1991).
Tufts University, B.S. (1984), majors in Computer Science and English.

Professional Appointments:

2019– Dean, College of Arts and Sciences, Boston University.
2018–2019 Dean *ad interim*, College of Arts and Sciences, Boston University.
2007– Professor, Department of Computer Science, Boston University.
2015-2018 Associate Dean of Mathematical and Computational Sciences, Boston University.
2007–2013 Chair, Department of Computer Science, Boston University.
2001–2007 Associate Professor, Department of Computer Science, Boston University.
2002 (fall) Visiting Scientist, M.I.T. Artificial Intelligence Laboratory.
1995–2001 Assistant Professor, Department of Computer Science, Boston University.
1989–1994 Research Assistant, M.I.T. Media Laboratory.
1987–1989 Senior Software Engineer, Schlumberger Technologies, CAD/CAM Div., Computer Graphics Group.
1984–1987 Software Engineer, Schlumberger Technologies, Solids Modeling Group.
1983–1984 Programmer, Portable Software.

Professional Services and Societies:

Associate Editor in Chief, IEEE Transactions on Pattern Analysis and Machine Intelligence, 2013–2016.
Associate Editor, IEEE Transactions on Pattern Analysis and Machine Intelligence, 2000–2004, 2006–2011.
Associate Editor, Image and Vision Computing Journal, 2012–2017.
Alumni nominee, MIT Corporation Visiting Committee for the Media Laboratory/Media Arts and Sciences, 2002–2007.
Member, Standing Committee of External Evaluators, Italian Institute of Technology, 2013–2019.
Advisory Board Member, Computer Vision Foundation, 2016–present.
Advisory Board Member, Department of Computer Science, Tufts University, 2011–2015.
Advisory Board Member, Springer series on Advances in Computer Vision and Pattern Recognition, 2012–present.
Advisory Committee Member, IEEE Conf. on Automatic Face and Gesture Recognition, 2015, 2019.
Advisory Committee Member, IEEE Workshop on Camera Networks and Wide Area Scene Analysis, 2011.
General Co-Chair, Intl. Conf. on Image Analysis and Processing (ICIAP), 2022.
General Co-Chair, IAPR Intl. Conf. on Pattern Recognition (ICPR), 2020.
General Co-Chair, IEEE Conf. on Comp. Vision and Pattern Recognition (CVPR), 2015.
Program Co-Chair, IEEE Conf. on Automatic Face and Gesture Recognition, 2013.
Chair, Best Paper Award Committee, IEEE Conf. on Comp. Vision and Pattern Recognition (CVPR), 2014.
Co-Chair, Award Committee, IEEE Conf. on Automatic Face and Gesture Recognition, 2015.
Area Chair, International Conf. on Computer Vision (ICCV), 2013, 2017.
Area Chair, European Conf. on Computer Vision (ECCV), 2012.
Area Chair, IEEE Conf. on Comp. Vision and Pattern Recognition (CVPR), 2006, 2009, 2010, 2011, 2017, 2018.
Area Chair, IEEE Intl. Conf. on Automated Face and Gesture Recognition, 2011.
Area Chair, IEEE Conf. on Advanced Video and Signal based Surveillance (AVSS), 2010.
Co-Organizer, IEEE AI City Challenge Workshop, 2021, 2022, 2023.
Co-Organizer, IEEE CVPR Workshop on Long-Term Detection and Tracking, 2014.
Co-Organizer, IEEE Workshop on Camera Networks, 2010.
Program Committee, ChaLearn Looking at People Workshop, 2015.
Program committee, IEEE Workshop on Camera Networks and Wide Area Scene Analysis, 2012, 2013.
Program committee, IEEE Workshop on Action Recognition with Large Number of Classes, 2013.
Program committee, Intl. Workshop on Human Activity Understanding from 3D Data, 2011, 2012, 2013.
Program committee, Intl. Workshop on Understanding Human Activities through 3D Sensors (UHA3DS), 2016, 2018.
Program committee, Intl. Workshop on Sign, Gesture, and Activity, 2010.
Program committee, ACM Workshop on Analysis and Retrieval of Tracked Events and Motion in Imagery Streams, 2010.
Program committee, IEEE Intl. Conf. on Comp. Vision (ICCV), 2005, 2007, 2009, 2011.
Program committee, ACM/IEEE Intl. Conf. on Distributed Smart Cameras (ICDSC), 2008, 2009.
Program committee, IEEE Workshop on CVPR for Human Communicative Behavior Analysis, 2008, 2009, 2010.

Program committee, ACM Intl. Conf. on Multimedia Information Retrieval, 2008.
Program committee, Intl. Workshop on Tracking Humans for the Evaluation of their Motion in Image Sequences, 2008.
Program committee, Workshop on Evaluation of Human Motion and Pose Estimation, 2006, 2007.
Program committee, IEEE Workshop on Component Analysis Methods for Computer Vision, 2007.
Program committee, IEEE Workshop on Analysis and Modeling of Faces and Gestures, 2007, 2015.
Program committee, IEEE Workshop on Human Motion – Understanding, Modeling, Capture and Animation, 2007, 2010.
Program committee, IEEE Workshop on Comp. Vision for Human Computer Interaction (V4HCI), 2005, 2006.
Program committee, IEEE Workshop on Modeling People and Human Interaction, 2005.
Program committee, ACM Intl. Workshop on Video Surveillance and Sensor Networks, 2005, 2006.
Program committee, IEEE Workshop on the Applications of Computer Vision (WACV), 2013.
Program committee, IEEE Conf. on Advanced Video and Signal based Surveillance (AVSS), 2006, 2009, 2012.
Program committee, EU Workshop on Audio-Visual Content and Info. Visualization in Digital Libraries, 2005.
Program committee, SPIE Conf. on Internet Multimedia Management Systems, 2005.
Program committee, IEEE Workshop on Human Computer Interaction, 2005.
Program committee, European Conf. on Comp. Vision (ECCV), 2004, 2006, 2008, 2016.
Program committee, IEEE Workshop on Real-time Vision for Human Computer Interaction, 2004.
Program committee, ECCV Workshop on Human Comp. Interaction, 2004, 2006.
Program committee, SIGHI Italy Workshop on Natural Interaction, 2004.
Program committee, IEEE Intl. Workshop on Visual Surveillance, 2003, 2004, 2005, 2006, 2007, 2008.
Program committee, ACM Intl. Conf. on Multimedia Information Retrieval, 2003, 2005, 2007, 2008.
Program committee, IEEE Workshop on Motion and Video Computing, 2002, 2007.
Program committee, IEEE Online Learning for Computer Vision Workshop, 2007, 2008, 2009, 2010.
Program committee, IEEE Workshop on Performance Evaluation of Tracking and Surveillance, 2001, 2002, 2003, 2005 2007, 2012.
Program committee, Intl. Conf. on Image and Video Retrieval, 2002, 2003, 2004, 2005, 2006, 2007.
Program committee, IEEE Workshop on Cues in Communication, 2001.
Program committee, ICCV Workshop on Detection and Recognition of Events in Video, 2001.
Program committee, Multimedia Databases and Image Communication Workshop, 2001.
Program committee, IEEE Workshop on Human Modeling, Analysis and Synthesis, 2000.
Program committee, Comp. Animation, 2000, 2001, 2002.
Program committee, IEEE Intl. Conf. on Multimedia, 2000.
Program committee, IEEE Conf. on Automatic Face and Gesture Recognition, 2000.
Program committee, IEEE Comp. Vision and Pattern Recognition (CVPR), 1997, 1998, 1999, 2000, 2001, 2004, 2005, 2007, 2008, 2012, 2016.
Program committee, IEEE Workshop on Content-based Access of Image and Video Libraries, 1997, 1999, 2000, 2001.
Program committee, Intl. Conf. on Visual Information, 1999.
Program committee, IEEE Workshop on Modeling People, 1999.
Program committee, IEEE Model Based 3D Image Analysis Workshop, 1998.
Program committee, IEEE Nonrigid and Articulated Motion Workshop, 1997, 2004.
Program committee, Intl. Conf. on Pattern Recognition, 1996, 2002, 2004, 2006.
Program review committee, ACM Multimedia, 1996.
Member of eleven NSF Review Panels 1996–present, and site visit panel 2004.

Special Recognitions, Honors, Awards:

Fellow: IEEE, IAPR.
Mentor of the Year Award, BU Graduate Women in Science and Engineering, 2018.
Best Paper Prize, IEEE Workshop on Computer Vision and Pattern Recognition for Human Communicative Behavior Analysis (with V. Athitsos, C. Neidle, J. Poole-Nash, A. Stefan, Q. Yuan, and A. Thangali) 2008.
Best Paper Prize, Int. Conf. on Document Analysis and Recognition (with J. Alon and V. Athitsos), 2005 .
Young Investigator Award, Office of Naval Research, 1996.
Faculty Early Career Development Award, National Science Foundation, 1996.

Patents:

10990626, Data Storage and Retrieval System using Online Supervised Hashing, April 27, 2021.
5590261, A Finite Element for Image Morphing and Alignment, December 31, 1996.

Book:

[1] J. Zhang, F. Malmberg, and S. Sclaroff. *Visual Saliency: From Pixel-Level to Object-Level Analysis*. Springer International Publishing, 2019. DOI 10.1007/978-3-030-04831-0.

Publications in Refereed Journals:

[1] A. Pentland, I. Essa, M. Friedmann, B. Horowitz, S. Sclaroff, and T. Starner. The Thingworld modeling system: Virtual sculpting by modal forces. *ACM Computer Graphics*, 24(2):143–144, March 1990.

[2] S. Sclaroff and A. Pentland. Generalized implicit functions for computer graphics. *ACM Computer Graphics (SIGGRAPH)*, 25(4):247–250, August 1991.

[3] A. Pentland and S. Sclaroff. Closed-form solutions for physically based shape modeling and recognition. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 13(7):715–730, July 1991.

[4] I. Essa, S. Sclaroff, and A. Pentland. A unified approach for physical and geometric modeling for graphics and animation. *Computer Graphics Forum*, 11(3):129–138, September 1992.

[5] S. Sclaroff and A. Pentland. Modal matching for correspondence and recognition. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 17(6):545–561, June 1995.

[6] A. Pentland, R. Picard, and S. Sclaroff. Photobook: Content-based manipulation of image databases. *International Journal of Computer Vision (IJCV)*, 18(3):233–254, June 1996.

[7] S. Sclaroff. Deformable prototypes for encoding shape categories in image databases. *Pattern Recognition*, 30(4):627–642, April 1997.

[8] J. Martin, A. Pentland, S. Sclaroff, and R. Kikinis. Characterization of neuropathological shape deformations. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 30(2):97–112, February 1998.

[9] S. Sclaroff, M. La Cascia, S. Sethi, and L. Taycher. Unifying textual and visual cues for content-based image retrieval on the world wide web. *Computer Vision and Image Understanding (CVIU)*, 75(1):86–98, July 1999.

[10] M. La Cascia, S. Sclaroff, and V. Athitsos. Fast, reliable head tracking under varying illumination: An approach based on registration of texture-mapped 3D models. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 22(4):322–336, April 2000.

[11] S. Sclaroff and L. Liu. Deformable shape detection and description via model-based region grouping. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 23(5):475–489, 2001.

[12] C. Neidle, S. Sclaroff, and V. Athitsos. Signstream: A tool for linguistic and computer vision research on visual-gestural language data. *Behavior Research Methods, Instruments and Computers*, 33(3):311–320, 2001.

[13] L. Liu and S. Sclaroff. Index trees for accelarating deformable template matching. *Pattern Recognition Letters*, 23(12):1483–1493, 2002.

[14] S. Sclaroff and J. Isidoro. Active blobs: Region-based, deformable appearance models. *Computer Vision and Image Understanding (CVIU)*, 89(2-3):197–225, 2003.

[15] R. Rosales and S. Sclaroff. A framework for heading-guided recognition of activity. *Computer Vision and Image Understanding (CVIU)*, 91(3):335–367, 2003.

[16] L. Liu and S. Sclaroff. Deformable model-guided split and merge of image regions. *Image and Vision Computing*, 22(4):343–354, 2004.

[17] L. Sigal, S. Sclaroff, and V. Athitsos. Skin color-based video segmentation under time-varying illumination. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 26(7):862–877, 2004.

[18] R. Rosales and S. Sclaroff. Combining generative and discriminative models in a framework for articulated pose estimation. *International Journal of Computer Vision (IJCV)*, 67(3):251–276, 2006.

[19] M. Erdem and S. Sclaroff. Automated camera layout to satisfy task-specific and floorplan-specific coverage requirements. *Computer Vision and Image Understanding (CVIU)*, 103(3):156–169, 2006.

[20] V. Athitsos, M. Hadjieleftheriou, G. Kollios, and S. Sclaroff. Query-sensitive embeddings. *ACM Trans. on Database Systems (TODS)*, 32(2):8:1–32, 2007.

[21] V. Athitsos, J. Alon, S. Sclaroff, and G. Kollios. Boostmap: An embedding method for efficient nearest neighbor retrieval. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 30(1):89–104, 2008.

[22] J.B. Wang, V. Athitsos, S. Sclaroff, and M. Betke. Detecting objects of variable shape structure with hidden state shape models. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 30(3), 2008.

[23] R. Li and S. Sclaroff. Multi-scale 3D scene flow from binocular stereo sequences. *Computer Vision and Image Understanding (CVIU)*, 110(1):91–101, 2008.

[24] H.D. Yang, S. Sclaroff, and S.W. Lee. Sign language spotting with a threshold model based on conditional random fields. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 31(7):1264–1277, 2009.

[25] J. Alon, V. Athitsos, Q. Yuan, and S. Sclaroff. A unified framework for gesture recognition and spatiotemporal gesture segmentation. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 31(9):1685–1699, 2009.

[26] P. Papapetrou, G. Kollios, S. Sclaroff, and D. Gunopulos. Mining frequent arrangements of temporal intervals. *Knowledge and Information Systems (KAIS)*, 21(2):133–171, 2009.

[27] R. Li, T.P. Tian, S. Sclaroff, and M.H. Yang. 3D human motion tracking with a coordinated mixture of factor analyzers. *International Journal of Computer Vision (IJCV)*, 87(1-2):170–190, 2010.

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[29] Q. Yuan, A. Thangali, V. Ablavsky, and S. Sclaroff. Learning a family of detectors via multiplicative kernels. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 33(3), March 2011.

[30] V. Ablavsky and S. Sclaroff. Layered graphical models for tracking partially-occluded objects. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 33(9), 2011.

[31] U.M. Erdem and S. Sclaroff. Event prediction in a hybrid camera network. *ACM Trans. on Sensor Networks*, 8(2), 2012.

[32] R. Li, T.P Tian, and S. Sclaroff. Divide, conquer and coordinate: Globally coordinated switching linear dynamical system. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 34(4):654–669, 2012.

[33] L. Lo Presti, S. Sclaroff, and M. La Cascia. Path modeling and retrieval in distributed video surveillance databases. *IEEE Trans. on Multimedia*, 14(2):346–360, 2012.

[34] N. Ikizler-Cinbis and S. Sclaroff. Web-based classifiers for human action recognition. *IEEE Trans. on Multimedia*, 14(4), 2012.

[35] J.F. Vigueras-Gomez and S. Sclaroff. Fast vision-based scene modeling for augmented reality in unprepared man-made environments. *Journal of Ambient Intelligence and Smart Environments*, 5(5):525–537, 2013.

[36] H. Jiang, T.P. Tian, and S. Sclaroff. Scale and rotation invariant matching using linearly augmented trees. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 37(12):2558–2572, 2015.

[37] L. Lo Presti, M. La Cascia, S. Sclaroff, and O. Camps. Hankelet-based dynamical systems modeling for 3D action recognition. *Image and Vision Computing*, 44:29–43, December 2015.

[38] A. Hernandez-Vela, S. Sclaroff, and S. Escalera. Poselet-based contextual rescoring for human pose estimation via pictorial structures. *International Journal of Computer Vision (IJCV)*, 118(1):49–64, 2016.

[39] J. Zhang and S. Sclaroff. Exploiting surroundedness for saliency detection: A boolean map approach. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 38(5):889–902, 2016.

[40] A. Joshi, C. Monnier, M. Betke, and S. Sclaroff. Comparing random forest approaches to segmenting and classifying gestures. *Image and Vision Computing*, 2016.

[41] F. Cakir, S.A. Bargal, and S. Sclaroff. Online supervised hashing. *Computer Vision and Image Understanding (CVIU)*, 156:162–173, 2017.

[42] S. Ma, J. Zhang, S. Sclaroff, N. Ikizler-Cinbis, and L. Sigal. Space-time tree ensemble for action recognition and localization. *International Journal of Computer Vision (IJCV)*, 2017.

[43] S. Ma, J. Zhang, S. Bargal, S. Sclaroff, and L. Sigal. Do less and achieve more: Training CNNs for action recognition utilizing action images from the web. *Pattern Recognition*, 2017.

[44] J. Zhang, S. Ma, M. Sameki, S. Sclaroff, M. Betke, Z. Lin, X. Shen, B. Price, and R. Mech. Salient object subitizing. *International Journal of Computer Vision (IJCV)*, 2017.

[45] J. Zhang, S. Bargal, Z. Lin, X. Shen, J. Brandt, and S. Sclaroff. Top-down neural attention by excitation backprop. *International Journal of Computer Vision (IJCV)*, 2017.

[46] D. Gurari, K. He, B. Xiong, J. Zhang, M. Sameki, S. Sclaroff S.D. Jain, M. Betke, and K. Grauman. Predicting foreground object ambiguity and efficiently crowdsourcing the segmentation(s). *International Journal of Computer Vision (IJCV)*, 126:714–730, 2018.

[47] K. He, F. Cakir, S. Bargal, and S. Sclaroff. Hashing with mutual information. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 41(10):2424–2437, 2019.

[48] P. Hu, F. Perazzi, F.C. Heilbron, O. Wang, Z. Lin, K. Saenko, and S. Sclaroff. Real-time semantic segmentation with fast attention. *IEEE Robotics and Automation Letters*, 6(1):263–270, 2021.

[49] A. Zunino, S. Bargal, P. Morerio, J. Zhang, S. Sclaroff, and V. Murino. Excitation dropout: Encouraging plasticity in deep neural networks. *International Journal of Computer Vision (IJCV)*, 129:1139–1152, 2021.

[50] S. Bargal, A. Zunino, V. Petsiuk, J. Zhang, K. Saenko, V. Murino, and S. Sclaroff. Guided zoom: Zooming into network evidence to refine fine-grained model decisions. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 43(11):4196–4202, 2021.

[51] B. Plummer, K.J. Shih, Y. Li, K. Xu, S. Lazebnik, S. Sclaroff, and K. Saenko. Revisiting image-language networks for open-ended phrase detection. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 44(4):2155–2167, 2022.

[52] P. Hu, S. Sclaroff, and K. Saenko. Leveraging geometric structure for label-efficient semi-supervised scene segmentation. *IEEE Trans. on Image Processing*, 31:6320–6330, 2022.

[53] S.S. Majumdar, S. Jain, I.C. Tourni, A. Mustafin, D. Lteif, S. Sclaroff, K. Saenko, and S.A. Bargal. Ani-GIFs: A benchmark dataset for domain generalization of action recognition from GIFs. *Frontiers in Computer Science, Sec. Computer Vision*, 26, September 2022.

[54] N. Ruiz, H. Yu, D.A. Allessio, M. Jalal, A. Joshi, T. Murray, J.J. Magee, K.M. Delgado, V. Ablavsky, S. Sclaroff, I. Arroyo, B.P. Woolf, S.A. Bargal, and M. Betke. ATL-BP: A student engagement dataset and model for affect transfer learning for behavior prediction. *IEEE Trans. on Biometrics, Behavior, and Identity Science*, 5:411–424, July 2023.

[55] P. Hu, S. Niklaus, L. Zhang, S. Sclaroff, and K. Saenko. Video frame interpolation with many-to-many splatting and spatial selective refinement. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 46:823–836, February 2024.

[56] P. Hu, X. Sun, S. Sclaroff, and K. Saenko. DualCoOp++: Fast and effective adaptation to multi-label recognition with limited annotations. *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)*, 46:3450–3462, May 2024.

Publications in Refereed Proceedings:

[1] S. Sclaroff. CSG ray tracing using octtrees. In *Proc. Schlumberger Software Conf.*, pages 571–578, November 1988.

[2] A. Pentland, M. Friedmann, B. Horowitz, S. Sclaroff, and T. Starner. The Thingworld modeling system. In *Proc. International Workshop on Algorithms and Parallel VLSI Architectures*, pages 168–172, June 1990.

[3] T. Darrell, S. Sclaroff, and A. Pentland. Segmentation by minimal description. In *Proc. IEEE International Conf. on Computer Vision (ICCV)*, pages 112–116, December 1990.

[4] A. Pentland, B. Horowitz, and S. Sclaroff. Non-rigid motion and structure from contour. In *Proc. IEEE Workshop on Visual Motion*, pages 288–293, October 1991.

[5] S. Sclaroff and A. Pentland. Closed-form solutions for physically-based shape modeling and recognition. In *Proc. IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, pages 238–243, June 1991.

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[7] S. Sclaroff and A. Pentland. Modal models: Energy-based implicit functions. In *Proc. SPIE Sensor Fusion V*, pages 14–23, November 1992.

[8] S. Sclaroff and A. Pentland. A modal framework for correspondence and description. In *Proc. IEEE International Conf. on Computer Vision (ICCV)*, pages 308–313, May 1993.

[9] A. Pentland, R. Picard, and S. Sclaroff. Photobook: Tools for content-based manipulation of image databases. In *SPIE Conf. on Storage and Retrieval of Image and Video Databases II*, pages 34–47, February 1994.

[10] S. Sclaroff and A. Pentland. Object recognition and categorization using modal matching. In *Proc. IEEE CAD-Based Vision Workshop*, pages 258–265, February 1994.

[11] A. Pentland, T. Darrell, I. Essa, A. Azarbayejani, and S. Sclaroff. Visually guided animation. In *Proc. Computer Animation '94*, pages 112–121, May 1994.

[12] S. Sclaroff and A. Pentland. Modal shape comparison. In *Aspects of Visual Form Processing (Proc. Workshop on Visual Form)*, pages 487–496, May 1994.

[13] S. Sclaroff and A. Pentland. On modal modeling for medical images: Underconstrained shape description and data compression. In *Proc. IEEE Workshop on Biomedical Image Analysis*, pages 70–79, June 1994.

[14] A. Pentland, I. Essa, T. Darrell, A. Azarbayejani, and S. Sclaroff. Visually guided interaction and animation. In *Record of the Twenty-Eighth Annual Asilomar Conf. on Signals, Systems, and Computers*, volume 2, pages 1287–1291, October 1994.

[15] S. Sclaroff and A. Pentland. Search by shape examples: Modeling nonrigid deformation. In *Record of the Twenty-Eighth Annual Asilomar Conf. on Signals, Systems, and Computers*, volume 2, pages 1341–1345, October 1994.

[16] S. Sclaroff and A. Pentland. Physically-based combinations of views: Representing rigid and nonrigid motion. In *Proc. IEEE Workshop on Nonrigid and Articulate Motion*, pages 158–164, November 1994.

[17] S. Sclaroff. Encoding deformable shape categories for efficient content-based search. In *Proc. First International Workshop on Image Databases and Multimedia Search*, pages 107–114, August 1996.

[18] W. Zhang, S. Dickinson, S. Sclaroff, I. Marsic, S. Hawkins, J. Feldman, and S. Dunn. Searching medical image databases by image content. In *Proc. Ninth Image and Multidimensional Signal Processing Workshop*, pages 146–147, March 1996.

[19] S. Sclaroff, L. Taycher, and M. La Cascia. ImageRover: A content-based image browser for the world wide web. In *Proc. IEEE Workshop on Content-Based Retrieval in Image Databases*, pages 2–9, June 1997.

[20] L. Taycher, M. La Cascia, and S. Sclaroff. Image digestion and relevance feedback in the ImageRover www search engine. In *Proc. International Conf. on Visual Information*, pages 85–92, December 1997.

[21] S. Sclaroff and J. Isidoro. Active blobs. In *Proc. IEEE International Conf. on Computer Vision (ICCV)*, pages 1146–1153, January 1998.

[22] M. La Cascia, J. Isidoro, and S. Sclaroff. Head tracking via robust registration in texture map images. In *Proc. IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, pages 508–514, June 1998.

[23] J. Isidoro and S. Sclaroff. Active voodoo dolls: A vision based input device for non-rigid control. In *Proc. Computer Animation*, pages 137–143, June 1998.

[24] M. La Cascia, S. Sethi, and S. Sclaroff. Combining textual and visual cues for content-based image retrieval on the world wide web. In *Proc. IEEE Workshop on Content-Based Access of Image and Video Libraries*, pages 24–29, June 1998.

[25] W. Zhang, S. Dickinson, S. Sclaroff, J. Feldman, and S. Dunn. Shape-based indexing for content-based medical image retrieval. In *Proc. IEEE Workshop on Biomedical Image Analysis*, pages 221–230, June 1998.

[26] R. Rosales and S. Sclaroff. Improved tracking of multiple humans with trajectory prediction and occlusion modeling. In *Proc. IEEE Workshop on the Interpretation of Visual Motion*, June 1998.

[27] L. Liu and S. Sclaroff. Automatic deformable shape segmentation for image database search applications. In *Proc. International Conf. on Visual Information*, pages 601–608, June 1999.

[28] M. La Cascia and S. Sclaroff. Fast, reliable head tracking under varying illumination. In *Proc. IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, volume 1, pages 604–610, June 1999.

[29] R. Rosales and S. Sclaroff. 3D trajectory recovery for tracking multiple objects and trajectory guided recognition of actions. In *Proc. IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, volume 2, pages 117–121, June 1999.

[30] L. Liu and S. Sclaroff. Deformable shape detection and description via model-based region grouping. In *Proc. IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, volume 2, pages 21–27, June 1999.

[31] S. Sethi and S. Sclaroff. Combinations of non-rigid deformable appearance models. In *SPIE Conf. on Telemanipulator and Telepresence Technologies VI (SPIE 3840)*, pages 2–12, September 1999.

[32] R. Rosales and S. Sclaroff. Trajectory guided recognition of actions. In *SPIE Conf. on Telemanipulator and Telepresence Technologies VI (SPIE 3840)*, pages 25–36, September 1999.

[33] J. Alon and S. Sclaroff. Recovery of piece-wise planar and piece-wise rigid models from non-rigid motion. In *SPIE Conf. on Three-Dimensional Imaging, Optical Metrology, and Inspection V (SPIE 3835)*, pages 72–83, September 1999.

[34] R. Rosales and S. Sclaroff. Learning and synthesizing human body motion and posture. In *Proc. International IEEE Conf. on Automatic Face and Gesture Recognition*, pages 506–511, March 2000.

[35] J. Alon and S. Sclaroff. Recursive estimation of motion and planar structure. In *Proc. IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, volume II, pages 550–556, June 2000.

[36] R. Rosales and S. Sclaroff. Inferring body pose without tracking body parts. In *Proc. IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, volume II, pages 721–727, June 2000.

[37] L. Sigal, Vassilis Athitsos, and S. Sclaroff. Estimation and prediction of evolving color distributions for skin segmentation under varying illumination. In *Proc. IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, volume II, pages 152–159, June 2000.

[38] L. Liu and S. Sclaroff. Index trees for efficient deformable shape-based retrieval. In *Proc. IEEE Workshop on Content-Based Access of Image and Video Libraries*, pages 83–87, June 2000.

[39] R. Rosales and S. Sclaroff. Specialized mappings and the estimation of human body pose from a single image. In *Proc. IEEE Workshop on Human Motion*, pages 19–24, November 2000.

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[176] D. Kim, T. Lan, C. Zou, N. Xu, B. Plummer, S. Sclaroff, J. Eledath, and G. Medioni. Multi-task learning from videos via efficient inter-frame attention. In *ICCV 2021 Workshop on Multi-Task Learning in Computer Vision (DeepMTL)*, 2021.

[177] M. Oliu, S. Bargal, X. Baro, S. Sclaroff, and S. Escalera. Multi-varied cumulative alignment for domain adaptation. In *Proc. Intl. Conf. on Image Analysis and Processing (ICIAP)*, 2022.

[178] P. Hu, S. Niklaus, S. Sclaroff, and K. Saenko. Many-to-many splatting for efficient video frame interpolation. In *Proc. IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2022.

[179] N. Ruiz, A. Kortylewski, W. Qiu, C. Xie, S. Bargal, A. Yuille, and S. Sclaroff. Simulated adversarial testing of face recognition models. In *Proc. IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2022.

[180] M. Naphade, S. Wang, D. Anastasiu, Z. Tang, M.-C. Chang, Y. Yao, L. Zheng, M.S. Rahman, A. Venkatachalapathy, A. Sharma, Q. Feng, V. Ablavsky, Stan Sclaroff, P. Chakraborty, A. Li, S. Li, and R. Chellappa. The 6th AI City Challenge. In *Proc. IEEE/CVF CVPR AI City Challenge Workshop*, 2022.

[181] D. Kim, K. Wang, S. Sclaroff, M. Betke, and K. Saenko. A unified framework for domain adaptive pose estimation. In *Proc. European Conf. on Computer Vision (ECCV)*, 2022.

[182] D. Kim, K. Wang, S. Sclaroff, and K. Saenko. A broad study of pre-training for domain generalization and adaptation. In *Proc. European Conf. on Computer Vision (ECCV)*, 2022.

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[184] N. Ruiz, C. Xie, S. Bargal, and S. Sclaroff. Practical disruption of image translation deepfake networks. *AAAI Conf. on Artificial Intelligence*, 2023.

[185] M. Naphade, S. Wang, D.C. Anastasiu, Z. Tang, M.C. Chang, Y. Yao, L. Zheng, M.S. Rahman, M.S. Arya, A. Sharma, Q. Feng, V. Ablavsky, S. Sclaroff, P. Chakraborty, S. Prajapati, A. Li, S. Li, K. Kunadharaju, S. Jiang, and R. Chellappa. The 7th AI City Challenge. In *The IEEE Conf. on Computer Vision and Pattern Recognition (CVPR) Workshops*, June 2023.

Book Chapters:

[1] A. Pentland, M. Friedmann, B. Horowitz, S. Sclaroff, and T. Starner. The Thingworld modeling system. In E.F. Deprettere, editor, *Algorithms and Parallel VLSI Architectures*. Elsevier Press, 1990.

[2] I. Essa, S. Sclaroff, and A. Pentland. Physically based modeling for graphics and vision. In R. Martin, editor, *Directions in Geometric Computing*, pages 161–196. Information Geometers, 1992.

[3] A. Pentland, S. Sclaroff, B. Horowitz, and I. Essa. Modal descriptions for modeling, recognition, and tracking. In *Three-Dimensional Object Recognition Systems I*, pages 423–446. Elsevier, 1993.

[4] A. Pentland and S. Sclaroff. Modal representations. In T. Boult M. Herbert, J. Ponce and A. Gross, editors, *Object Representation in Computer Vision*, pages 249–262. Springer Verlag, 1995.

[5] A. Pentland, R. Picard, and S. Sclaroff. Photobook: Content-based manipulation of image databases. In B. Furht, editor, *Multimedia Tools and Applications*. Kluwer Academic, 1996.

[6] A. Pentland, I. Essa, T. Darrell, A. Azarbayejani, and S. Sclaroff. Visually guided animation. In N. Thalmann and D. Thalmann, editors, *Interactive Computer Animation*, pages 143–164. Prentice Hall, 1996.

[7] S. Sclaroff. Distance to deformable prototypes: Encoding shape categories for efficient search. In A.W.M. Smeulders and R. Jain, editors, *Image Databases and Multi-Media Search*, pages 149–164. World Scientific, 1998.

[8] S. Sclaroff, M. La Cascia, S. Sethi, and L. Taycher. Mix and match features: Relevance feedback and combined similarity metrics. In M. Lew, editor, *Principles of Visual Information Retrieval*, pages 259–277. Springer Verlag, Germany, 2001.

[9] V. Athitsos, J. Alon, S. Sclaroff, and G. Kollios. Learning embeddings for fast approximate nearest neighbor retrieval. In T. Darrell, P. Indyk, G. Shakhnarovich, and P. Viola, editors, *Nearest-Neighbor Methods in Learning and Vision: Theory and Practice*, pages 143–162. MIT Press, 2006.

[10] Q. Yuan, A. Thangali, V. Ablavsky, and S. Sclaroff. Learning a family of detectors via multiplicative kernels. In J.M.R.S. Tavares and R.M.N. Jorge, editors, *Topics in Medical Image Processing and Computational Vision*. Springer Science, 2012.

[11] S.A. Bargal, A. Zunino, V. Petsiuk, V. Murino, S. Sclaroff, and K. Saenko. Beyond the visual analysis of deep model saliency. In A. Holzinger, R. Goebel, R. Fong, T. Moon, K.R. Muller, and W. Samek, editors, *xxAI - Beyond Explainable Artificial Intelligence*, pages 255–269. Springer Lecture Notes on Artificial Intelligence (LNAI), 2022.

Invited Papers:

[1] A. Pentland and S. Sclaroff. Modal representations. NSF/ARPA Workshop on 3-D Object Representation for Computer Vision, December 1994.

[2] J. Ponce, R. Bajcsy, D. Metaxas, T. Binford, D. Forsyth, M. Hebert, K. Ikeuchi, A. Kak, L. Shapiro, S. Sclaroff, A. Pentland, and G. Stockman. Object representation for object recognition. In *Proc. IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, pages 147–152, June 1994.

[3] S. Sclaroff and A. Pentland. Modal matching for correspondence and recognition. In *Proc. AFCET '94 (French Association for Artificial Intelligence) Tutorial: The MIT Approach to Vision and Interpretation Using Analysis-By-Synthesis*, Paris, France, January 1994.

[4] I. Essa, T. Darrell, A. Azarbayejani, S. Sclaroff, and A. Pentland. Looking at people: Extracting human movement. In *Proc. International Workshop on Computer Vision and Parallel Processing*, January 1995.

[5] S. Sclaroff. World wide web image search engines. Position paper presented at NSF/ARPA Visual Information Management, June 1995.

[6] S. Sclaroff, G. Kollios, M. Betke, and R. Rosales. Motion mining. In *Proc. Multimedia Databases and Image Communication Workshop*, volume 2184 of *Lecture Notes in Computer Science*, pages 16–30, Amalfi, Italy, September 2001. Springer-Verlag.

[7] S. Sclaroff, M. Betke, G. Kollios, J. Alon, V. Athitsos, R. Li, J. Magee, and T.-P. Tian. Tracking, analysis, and recognition of human gestures in video. In *Proc. International Conf. on Document Analysis and Recognition (ICDAR)*, pages 806–810, August 2005.

[8] S. Sclaroff, A. Thangali, Q. Yuan, and V. Ablavsky. Learning classifier families for object detection and parameter estimation. In *Proc. VipIMAGE 2011 – III ECCOMAS Thematic Conf. on Computational Vision and Medical Image Processing*, pages 15–18, 2011.

[9] S. Escalera, J. Gonzalez, X. Baro, M. Reyes, I Guyon, V. Athitsos, H. Escalante, L. Sigal, A. Argyros, C. Sminchisescu, R. Bowden, and S. Sclaroff. Chalearn multi-modal gesture recognition 2013: Grand challenge and workshop summary. In *Proc. of the 15th ACM International Conference on Multimodal Interaction (ICMI)*, pages 365–368, 2013.

[10] J. Zhang, M. Sameki, S. Ma, B. Price, R. Mech, X. Shen, M. Betke, S. Sclaroff, and Z. Lin. Salient object subitizing. In *SUNw: Scene Understanding Workshop, CVPR*, 2015.

Invited Lectures, Panels, Seminars, and Talks:

1. INRIA-Rocquencourt: *Modal Analysis for Model Recovery and Recognition, and for Recovering Non-rigid Structure from Motion*, Rocquencourt, France, January 1992.
2. Artificial Intelligence Laboratory, University of Edinburgh: *Modal Models: A Unified Representation for Physics-based Vision and Modeling*, Edinburgh, Scotland, September 1992.
3. Harvard University Medical School: *Recovering Parametric Physical Models from Medical Images*, Boston, MA, May 1993.
4. NSF Workshop on Functionality: *From Physics to Function*, given with Alex Pentland, Harper's Ferry, WV, Aug. 1993.
5. IEEE Workshop on CAD-based Vision: panel on Object Representation for Computer Vision, Champion, PA, February, 1994.
6. Institute for Information Technology, National Research Council of Canada: *Deformable Models for Image Understanding*, Ottawa, Ontario, March 1995.
7. Center for Intelligent Machines, McGill University: *Modal Models for Signal Understanding*, Montréal, Québec, March 1995.
8. NSF/ARPA Visual Information Management Workshop: panel on Image Databases, Cambridge, MA, June 1995.
9. The Rutgers University Series on Human and Computer Vision, Rutgers University: *Image Database Search by Example: Modeling Deformable Shape*, New Brunswick, NJ, August 1995.
10. Computer Science Colloquium Series, Dartmouth University: *Deformable Shape Prototypes For Interactive Image Database Search*, Hanover, NH, May 1996.
11. Interval Research Corporation: *Deformable Shape Prototypes For Interactive Image Database Search*, Palo Alto, CA, June 1996.

12. University of Marlyand: *ImageRover: Content-Based Image Browser for the World Wide Web*, College Park, MD, December 1996.

13. IEEE Nonrigid and Articulated Motion Workshop: panel on future research directions, Puerto Rico, June 1997.

14. IEEE Workshop on Generic Object Recognition: *Generic Object Recognition with Active Blobs*, Puerto Rico, June 1997.

15. The Rutgers University Series on Human and Computer Vision, Rutgers University: *Active Blobs*, New Brunswick, NJ, August 1997.

16. IBM Almaden Research Center: *ImageRover*, Almaden, CA, December 1997.

17. Interval Research Corporation *Active Blobs*, Palo Alto, CA, December 1997.

18. Xerox Palo Alto Research Center: *ImageRover*, Palo Alto, CA, December 1997.

19. Multi-Dimensional Signal Processing Laboratory Seminar, Boston University: *Active Blobs*, Boston, MA, March, 1998.

20. Microsoft Research Laboratory: *Active Blobs*, Redmond, WA, April 1998.

21. Cambridge Research Laboratory, Digital Equipment Corporation: *Active Blobs*, Cambridge, MA, April 1998.

22. Institute for Robotics and Intelligent Systems, University of Southern California: *Active Blobs*, Los Angeles, CA, June 1998.

23. Electrical and Computer Engineering Department, Boston University: *ImageRover: Content-Based Image Retrieval for the World Wide Web*, Boston, MA, November 1998.

24. Harris Corporation: *Active Blobs*, Melbourne, FL, November 1998.

25. University of Marlyand: *Active Blobs*, College Park, MD, November 1998.

26. Boston College: *Active Blobs*, Boston, MA, November 1998.

27. First International Workshop on Multimedia Internet Information Retrieval: *Content Based Image Browsing for the WWW*, Galassia Gutenberg Conference, Naples, Italy, February 1999.

28. Boston University: *Mix and Match Features: Relevance Feedback and Indexing Strategies Employed in the ImageRover WWW Search Engine*, Speech Processing Seminar Series, Department of Electrical and Computer Engineering, Boston University, March, 1999.

29. Yale University: *Active Blobs for Nonrigid Motion Tracking*, CVC group Vision Lunch seminar, Departments of Electrical Engineering and Computer Science, Yale University, April, 1999.

30. INRIA-Rocquencourt (two talks): *Unifying Textural and Visual Cues for Content-Based Image Retrieval on the WWW*, and *Inferring Body Pose without Tracking Body Parts*, Rocquencourt, France, March 2000.

31. IEEE Workshop on Content Based Access of Image and Video Libraries: panel on Object Recognition for CBIR Panel, South Carolina, June 2000.

32. IEEE Workshop on Human Modeling, Analysis and Synthesis: panel on future research directions in tracking and interpreting human motion, South Carolina, June 2000.

33. Massachusetts Institute of Technology: *Fast, Reliable Head Tracking under Varying Illumination: An Approach Based on Robust Registration of Texture-Mapped 3D Models*, Vision Interface Seminar, MIT Artificial Intelligence Laboratory, Cambridge, MA, October 2000.

34. University of Oslo, *Estimating and Tracking Human Motion in Video*, Department of Informatics, Oslo, Norway, January 2001.

35. The Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology (SINTEF): *Detection, Segmentation, Tracking, and Recognition of Nonrigid Shapes*, SINTEF Institute for Electronics and Cybernetics, Oslo, Norway, January 2001.

36. The University of Illinois, Urbana-Champaign: *A Nonlinear Supervised Learning Framework for Estimating Motion of Articulated Structures: Human Body and Human Hands*, The Beckman Institute, Champaign, Illinois, February 2001.

37. Ohio State University: *A Nonlinear Supervised Learning Framework for Estimating Motion of Articulated Structures: Human Body and Human Hands*, Computer Science Dept., Columbus, Ohio, February 2001.

38. Motorola Research Laboratory: *Detection, Segmentation, Tracking, and Recognition of Nonrigid Shapes*, Chicago, Illinois, February 2001.

39. IEEE Workshop on Cues in Communication: panel on future directions, Kauai, Hawaii, December 2001.

40. Linköping University: *Estimating and Tracking Human Motion in Video*, Dept. of Electrical Engineering, Linköping, Sweden, February 2002.

41. KTH Royal Institute of Technology: *Estimating and Tracking Human Motion in Video*, Computational Vision and Active Perception Laboratory, Dept. of Numerical Analysis and Computing Science, Stockholm, Sweden, February 2002.

42. Smith College: *Automatic Shape-based Image Retrieval*, Dept. of Computer Science, Northampton, MA, April 2002.

43. University of Maryland, College Park: *Estimating and Tracking Human Motion in Video*, Dept. of Computer Science, College Park, MD, October 2002.

44. University of Palermo, *Estimating and Tracking Human Motion in Video*, Dipartimento di Ingegneria Informatica, Palermo, Italy, March 2003.

45. University of Florence, *Estimating and Tracking Human Motion in Video*, Dipartimento di Sistemi e Informatica, Florence, Italy, April 2003.

46. University of Padova, *Estimating and Tracking Human Motion in Video*, Dipartimento di Ingegneria Informatica, Padova, Italy, May 2003.

47. The Media and Technology Charter High School, *Computer Human Interfaces*, Boston, MA, November 2003.

48. Boston University, *Motion Capture Without Wires or Markers: Computer Vision Techniques for Tracking Hand and Body Motion in Uncalibrated Video*, Neuro-Muscular Research Center, January 2004.

49. Charles River Analytics, Inc. *Embedding Methods for Efficient Matching of Edge Images*, February 2004.

50. Tufts University. *Computer Vision Techniques for Analysis of Human Gesture*, Dept. of Computer Science, April 2005.

51. Rutgers University. *Computer Vision Techniques for Analysis of Human Gesture*, Dept. of Computer Science, April 2005.

52. Massachusetts Institute of Technology. *Tracking, Analysis, and Recognition of Human Gestures*, MIT Machine Vision Colloquium, April 2005.

53. Ohio State University. *Tracking, Analysis, and Recognition of Human Gestures*, Dept. of Electrical and Computer Engineering, May 2005.

54. University of Illinois, Urbana-Champaign. *Tracking, Analysis, and Recognition of Human Gestures*, Image Formation and Processing Group, The Beckman Institute, July, 2005.

55. International Conf. on Document Analysis and Retrieval (ICDAR). *Tracking, Analysis, and Recognition of Human Gestures in Video*, Seoul, South Korea, August, 2005.

56. Korea Inst. of Science and Technology (KIST). *Sign Language Recognition Research for Intelligent Robots*, Robot Systems Lab., Seoul, South Korea, September, 2005.

57. University of Massachusetts, Amherst. *Computer Vision Techniques for Analysis of Human Gestures*, Dept. of Computer Science, Amherst, MA, October, 2005.

58. Siemens Corporate Research. *Spotting Shape and Motion Patterns of Interest in Images*, Dept. of Imaging and Visualization, Princeton, NJ, January, 2006.

59. Boston University: *Learning Prototype Embeddings for Measuring Similarity, Classification, and Retrieval*, Dept. of Cognitive and Neural Systems, February, 2007.

60. University of Toronto: *Satisfying Computer Vision Task Requirements in Video Camera Networks*, Computational Vision Research Seminar, Dept. of Computer Science, May, 2007.

61. International Conference on Image Analysis and Processing: *Surveillance on Graphs*, invited speaker, Modena, Italy, September, 2007.

62. Scuola di Dottorato Grupo di Ingegneria Informatica: *Supervised Learning Methods*, two-day course, University of Palermo, Italy, September, 2007.

63. Massachusetts Institute of Technology: *Mapping Methods for Human Pose Estimation*, invited lecture, 6.976 Special Topics in Computer Vision: Seminar of Human Motion Tracking, October, 2007.

64. The University of Tokyo: *New Algorithms for Detection, Tracking, Analysis, and Classification of Objects and Human Actions*, Institute of Industrial Science, Tokyo, Japan, October, 2009.

65. CIMAT (Centro de Investigación en Matemáticas): *New Algorithms for Detection, Tracking, Analysis, and Classification of Objects and Human Actions*, Computation Group, CIMAT, Guanajuato, México, October, 2009.

66. Notre Dame: *Algorithms for Detection, Tracking, Analysis, and Classification of Objects and Human Actions*, Department of Computer Science and Engineering, March, 2011.

67. Max Planck Institute for Intelligent Systems: *Algorithms for Detection, Tracking, Analysis, and Classification of Objects and Human Actions*, Tübingen, Germany, April, 2011.

68. CVPR Workshop on Activity Recognition Challenges (Activity Recognition Competition): *Object, Scene and Actions: Multi-Feature MIL for Human Action Recognition*, Colorado Springs, CO, June, 2011.

69. III ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing (VipIMAGE 2011), Keynote talk: *Learning Classifer Families for Object Detectin and Parameter Estimation*, Olhao, Portugal, October, 2011.

70. Max Planck Institute for Informatics: *Algorithms for Detection, Tracking, Analysis, and Classification of Objects and Human Actions*, Saarbrücken, Germany, April, 2012.

71. International Workshop on Computer Vision: *Variable Structured Models*, Siracusa, Italy, May 2012.

72. IMS/ASA Spring Research Conference 2012, Enabling the Interface between Statistics and Engineering: *Learning Models of Human Action from Image and Videos on the Web*, Harvard University, Cambridge, MA, June 2012.

73. British Machine Vision Conference 2012, Keynote talk, *People in Motion: Pose, Action, and Communication*, Guildford, England, September, 2012.

74. University of Florence, *Objects and Poses*, Florence, Italy, October, 2013.

75. University of Florence, *Action! Improved Action Recognition and Localization in Video*, Florence, Italy, October, 2013.

76. Italian Institute of Technology, *Video-Based Analysis of Peoples Actions, Interactions and Social Behaviors*, Genova, Italy, 2013.

77. Northeastern University, *Action! Improved Action Recognition and Localization in Video*, Boston, MA, February, 2014.

78. Max Planck Institute for Intelligent Systems: *Video-based Analysis of Humans and Their Behavior*, Tübingen, Germany, March, 2014.

79. EPFL Lausanne: *Video-Based Analysis of Human Actions, Interactions and Social Behaviors*, Lausanne, Switzerland, May, 2014.

80. ETH Zürich: *Video-Based Analysis of Human Actions, Interactions and Social Behaviors*, Zürich, Switzerland, May, 2014.

81. Toyota Technical Institute: *Video-Based Analysis of Human Actions, Interactions and Social Behaviors*, Chicago, Illinois, October, 2014.

82. ChaLearn Looking at People CVPR Workshop: *People in Action and Interaction*, Boston, MA, June 2015.

83. Systems and Technology Research, Inc.: *People in Action and Interaction*, Woburn, MA, July 2015.

84. IEEE Conference on Automatic Face and Gesture Recognition: *Saliency and Personalization in Deep Models of Gestures and Activities* , Keynote, Washington, DC, June 2017.

85. IEEE International Conference on Advanced Video and Signal Based Surveillance: *Saliency and Personalization in Deep Models of Human Activity*, Lecce, Italy, August 2017.

86. University of Palermo, *Modeling Attention and Capabilities of Humans and Algorithms in Vision Tasks*, Dipartimento di Ingegneria Informatica, Palermo, Italy, May 2018.

87. University of Florence, *Modeling Attention and Capabilities of Humans and Algorithms in Vision Tasks*, Media Integration and Communication Center, Florence, Italy, May 2018.

88. Italian Institute of Technology, *Learning to Embed while Learning to Rank*, PAVIS Department, Genoa, Italy, May 2018.

89. University of Florence, *The Future will be Unsupervised*, Florence, Italy, November 2022.

90. AMS Joint Mathematics Meetings, *Panel on Double Anonymous Peer Review*, Boston, MA, January 2023.

Undergraduate and Graduate Teaching:

1. CS 111 (Spring 05). Introduction to Computer Science in Java.

2. CS 113 (Spring 96 and 00). Introduction to Computer Science II with Intensive C/C++.

3. CS 480/680 (Spring 95, 96, 97, 98, 99, 08, 10, 11, 12, 13, Fall 00, 01, 03, 04, 05, 06, 14, 15). Introduction to Computer Graphics.

4. CS 542 (Spring 07, 09, 15) Machine Learning.

5. CS 580 (Fall 97, 99, Spring 01, 02, 04, 06). Advanced Computer Graphics.

6. CS 585 (Fall 96 and 98). Introduction to Image and Video Computing.

7. CS 591-A1 (Spring 95 and 96). Seminar in Computer Graphics.

8. CS 835-A1 (Fall 95). Seminar in Image and Video Computing.

9. Undergraduate Directed Study. Chris Abernethy and Rosa Lin (Spring 98), Abdulwajid Mohamed (Fall 98), Max Frenkel (Spring 99), Matheen Siddiqui (Fall 99), and Michael Ourinson (Spring 02), Kevin Law (Fall 04, Spring 05), Michael Chau (Spring 05), Rich Marscher (Spring 09), Jennifer Collins (Spring 16), Tania Papandrea (Spring 16), Jake Dharmarsiri (Fall 17), Chloe Fortuna (Fall 17).

Post-Doctoral Researchers, Supervised:

Vassilis Athitsos, Sarah Adel Bargal, Nazli Ikizler-Cinbis, Marco La Cascia, Liliana Lo Presti, Bryan A. Plummer, Javier-Flavio Vigueras Gomez, Hanxiao Wang.

Graduate Researchers, Supervised:

Vitaly Ablavsky, Jonathan Alon, Vassilis Athitsos, Qinxun Bai, Sarah Adel Bargal, Dan Buzan, Fatih Cakir, R. Gokberk Cinbis, U. Murat Erdem, Charalampos Fligkos, Fred Fung, Antonio Hernandez, Ping Hu, John Isidoro, Tadeusz Jordan, Ajjen Joshi, Siripong Kaewyou, Donghyun Kim, He Kun, Rui Li, Lifeng Liu, Liliana Lo Presti, Shugao Ma, Hani Mawlawi, Romer Rosales, Nataniel Ruiz, Saratendu Sethi, Matheen Siddiqui, Leonid Sigal, Witold Stankiewicz, Alexandra Stefan, Leonid Taycher, Ashwin Thangali, Taipeng Tian, Rob Truxler, Jared Wickman, Hee-Deok Yang, Quan Yuan, Jianming Zhang, and Jing Zhong.

Doctoral Thesis, Advisor:

1. Lifeng Liu, *Shape Model-Based Region Grouping: A Method for Deformable Object Detection and Retrieval*, Dec. 2000, B.U. Dept. of Computer Science.
2. Romer Rosales, *Specialized Mappings Architecture with Applications to Vision-Based Estimation of Articulated Body Pose*, Dec. 2001, B.U. Dept. of Computer Science.
3. John Isidoro, *Stochastic Mesh-Based Multiview Reconstruction*, May 2004, B.U. Dept. of Computer Science.
4. Vassilis Athitsos, *Learning Embeddings for Indexing, Retrieval, and Classification, with Applications to Object and Shape Recognition in Image Databases*, May 2006, B.U. Dept. of Computer Science.
5. Jonathan Alon, *Spatiotemporal Gesture Segmentation*, May 2006, B.U. Dept. of Computer Science.
6. Murat Erdem, *Optimal Placement and Event Prediction in a Hybrid Camera Network with Minimum Knowledge*, May 2008, B.U. Dept. of Computer Science.
7. Rui Li, *Simultaneous Learning of Non-linear Manifold and Dynamical Models for High-Dimensional Time Series* May 2009, B.U. Dept. of Computer Science.
8. Quan Yuan, *Learning of a Family of Detectors*, Dec. 2009, B.U. Dept. of Computer Science.
9. Tai-peng Tian, *Efficient Techniques for Recovering 2D Human Body Poses from Images*, May 2011, B.U. Dept. of Computer Science.
10. Vitaly Ablavsky, *Layers of Graphical Models for Tracking and Action-Recognition in Video*, May 2011, B.U. Dept. of Computer Science.
11. Ashwin Thangali, *Exploiting Phonological Constraints for Handshape Recognition in Sign Language Video*, May 2013, B.U. Dept. of Computer Science.
12. Antonio Hernandez-Vela, *From pixels to gestures: learning visual representations for human analysis in color and depth data sequences*, January 2015, Universitat de Barcelona (co-director of thesis with Dr. Sergio Escalera).
13. Shugao Ma, *Learning Space-Time Structures for Human Action Recognition and Localization*, May 2016, B.U. Dept. of Computer Science.
14. Jianming Zhang, *Visual Saliency Computation for Image Understanding* , August 2016, B.U. Dept. of Computer Science.
15. Qinxun Bai, *A Differential Geometric Approach to Classification*, December 2016, B.U. Dept. of Computer Science (co-advised with Steve Rosenberg, B.U. Dept. of Mathematics and Statistics).
16. Fatih Cakir, *Online Supervised Hashing for Ever-Growing Datasets*, August 2017, B.U. Dept. of Computer Science.

17. Kun He, *Learning Deep Embeddings by Learning to Rank* , August 2018, B.U. Dept. of Computer Science.

18. Ajjen Joshi, *Personalized Face and Gesture Analysis Using Hierarchical Neural Networks*, August 2018, B.U. Dept. of Computer Science (co-advised with Margrit Betke).

19. Sarah Adel Bargal, *Grounding Deep Models of Visual Data* , December 2018, B.U. Dept. of Computer Science.

20. Qi Feng, *Tell Me What To Track: Visual Object Tracking by Natural Language Descriptions*, May 2022, B.U. Dept. of Computer Science.

21. Donghyun Kim, *Learning Generalizable and Transferable Representations Across Domains and Modalities*, May 2022, B.U. Dept. of Computer Science (co-advised with Kate Saenko).

22. Ping Hu, *Pixel-level Video Understanding with Efficient Deep Models*, December 2022, B.U. Dept. of Computer Science (co-advised with Kate Saenko).

23. Nataniel Ruiz, *Simulating to Learn: Using Adaptive Simulation to Train, Test and Understand Neural Networks*, May 2023, B.U. Dept. of Computer Science.

Doctoral Thesis, Examining Committee Member:

1. Zhixiang Chen, *Computational Learning Algorithms for Geometric and Algebraic Objects,* Jun. 1995 (third reader).

2. Janet Cahn, *A Computational Memory and Processing Model for Prosody*, Nov. 1998, MIT Media Laboratory (research advisor).

3. Gulrukh Ahanger, *Techniques for Automatic Digital Video Composition*, Dec. 1998, Dept of Electrical and Computer Engineering (second reader).

4. Loredona Lo-Conte, *Visible Volume: A Robust Measure for Protein Structure Characterization*, Jan. 2000 (third reader).

5. Zhengrong Ying, *Statistical Recognition of Occluded Articulated Objects*, Aug. 2001, B.U. Dept. of Electrical and Computer Engineering (third reader).

6. Lingmin Meng, *A Hierarchical Stochastic Framework for Image Pattern Recognition and Application in Face Detection*, May 2001, B.U. Dept. of Electrical and Computer Engineering (fourth reader).

7. Gen-nan Chen, *Fundamental Algorithms of Space-Variant Vision: Non-uniform sampling, triangulation, and foveal scale-space*, Dec. 2001, B.U. Dept. of Cognitive and Neural Systems (fourth reader).

8. Mats Stefan Carlin, *Improving the Performance of Shape Similarity Retrieval Systems*, Jan. 2001, Faculty of Mathematics and Natural Sciences, University of Oslo, Norway (opponent).

9. Linhui Jia, *Classification-Driven Object-Based Image Retrieval*, Jan. 2001, Dept. of Computer Science, The University of Melbourne, Australia (external examiner).

10. Xue Zhong, *Deformable Models for Object Extraction and Matching*, Dec. 2001, School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore (external examiner).

11. Jacob Ström, *Model-based Head Tracking and Coding*, Feb. 2002, Dept. of Electrical Engineering, Linköping University, Sweden (opponent).

12. Leo Grady, *Space-Variant Computer Vision: A Graph Theoretic Approach*, Aug. 2003, B.U. Dept. of Cognitive and Neural Systems (fourth reader).

13. Jesse Hoey, *Decision Theoretic Modeling of Human Facial Displays*, May 2004, Dept. of Computer Science, U. of British Columbia, Canada (external examiner).

14. Yonggang Shi, *Dynamic Imaging with Fast Level Set Methods*, May 2005, B.U. Dept. of Electrical and Computer Engineering (fourth reader).

15. Mirco Ristivojević, *Space-Time Image Sequence Analysis: Object Tunnels and Occlusion Volumes*, Jan. 2006, B.U. Dept. of Electrical and Computer Engineering (third reader).

16. Andrey Litvin, *Statistical Shape and Appearance Models for Segmentation and Classification*, May 2006, B.U. Dept. of Electrical and Computer Engineering (third reader).

17. Zhihua He, *Image Retrieval Using General Features*, Dec. 2006, B.U. Dept. of Electrical and Computer Engineering (third reader).

18. Jingbin Wang, *Object Segmentation and Recognition with Shape Constraints*, Dec. 2006, B.U. Dept. of Computer Science (second reader).

19. Oliver Hinds, *The Intrinsic Geometric Structure of Human Primary Visual Cortex*, May 2007, B.U. Dept. of Cognitive and Neural Systems (third reader).

20. Chih Wei Ong, *Beyond Lexical Meaning: Probabilistic Models for Sign Language Recognition*, 2007, School of Electrical and Electronic Engineering, National University of Singapore (external examiner).

21. William Mullally, *Example-Based Modeling for Medical Image Registration*, May 2009, B.U. Dept. of Computer Science (third reader).

22. Greg Amis, *Neural Models of Supervised and Self-Supervised Learning*, May 2009, B.U. Dept. of Cognitive and Neural Systems (reviewer).

23. Ogi Ogas, *A Superclass Priming Neural Architecture for Visual Classification*, May 2009, B.U. Dept. of Cognitive and Neural Systems (reviewer).

24. Panagiotis Papapetrou, *Embedding-Based Subsequence Matching*, Dec. 2009, B.U. Dept. of Computer Science (second reader).

25. Pei Yin, *Discriminative Analysis for American Sign Language Recognition and Verification*, Jan. 2010, Georgia Tech., College of Computing (reader).

26. Paul Allen Debitetto, *Robust Hierarchical Image-Augmented Navigation in Urban Terrain with 3D Landmarks*, May 2011, B.U. Dept. of Electrical and Computer Engineering (third reader).

27. Kai Guo, *Action Recognition on Covariance Manifolds*, Aug. 2011, B.U. Dept. of Electrical and Computer Engineering (reader).

28. John J. Magee IV, Sep. 2011, *Adaptable Interfaces for People with Motion Disabilities*, B.U. Dept. of Computer Science (committee chair).

29. Zheng Wu, Sep. 2012, *Occlusion Reasoning for Multiple Object Visual Tracking*, B.U. Dept. of Computer Science (second reader).

30. Samuel Epstein, May 2013, *Information and Distances*, B.U. Dept. of Computer Science (committee chair).

31. Yuyang Wang, July 2013, *Nonparametric Bayesian Mixed-effects Models for Multitask Learning*, Tufts University, Dept. of Computer Science (external reader).

32. Todd Hay, May 2015, *The Analytic Edge - Visual Scene Reconstruction via the Cauchy Integral Formula*, B.U. Program in Cognitive and Neural Systems (reviewer).

33. Bian Zhenpeng, July 2015, *Motion Capture and Processing*, Nanyang Technological University, Institute in Media Innovation (external examiner).

34. Diane H. Theriault, August 2015, *An Optimization-based Model of Collective Motion*, B.U. Dept. of Computer Science (second reader).

35. Danna Gurari, August 2015, *Combining Efforts of Crowdsourced Humans and Computers to Efficiently and Accurately Demarcate Object Boundaries in Images*, B.U. Dept. of Computer Science (second reader).

36. Sobhan Naderi Parizi, January 2016, *Modeling and Optimization of Classifiers in Absence of Supervision*, Brown University, Dept. of Computer Science (third reader).

37. Haohan Zhu, February 2016, *Sequence Queries on Temporal Graphs*, B.U. Dept. of Computer Science (fourth reader).

38. Greg Castanon, May 2016, *Exploratory Search Through Large Video Corpora*, B.U. Dept. of Electrical and Computer Engineering (third reader).

39. Mikhail Breslav, September 2016, *3D Pose Estimation of Flying Animals in Multi-View Video Datasets*, B.U. Dept. of Computer Science (second reader).

40. Yuting Chen, May 2017, *Similarity Learning Based Person Re-identification*, B.U. Dept. of Electrical and Computer Engineering (third reader).

41. Jacopo Cavazza, April 2018, *Learning by Correlation for Computer Vision Applications: from Kernel Methods to Deep Learning*, Dept. of Electrical, Electronic and Telecommunications Engineering, and Naval Architecture, University of Genova, Italy (external reader).

42. Tolga Bolukbasi, May 2018, *Adaptive and Multi-Objective Learning*, B.U. Dept. of Electrical and Computer Engineering (third reader).

43. Wenxin Feng, August 2018, *Dwell-free Input Interfaces for People with Motor Impairments*, B.U. Dept. of Computer Science (second reader).

44. Huijuan Xu, August 2018, *Vision and Language with Localization*, B.U. Dept. of Computer Science (second reader).

45. Mahdi Biparva, September 2019, *Top-Down Selectin in Convolutional Neural Networks*, York University, Dept. Electrical Engineering and Computer Science (external examiner).

46. Vasili Ramanishka, May 2020, *Describing and Retrieving Visual Content Using Natural Language*, B.U. Dept. of Computer Science (second reader).

47. Xingchao Peng, May 2020, *Domain Adaptive Learning with Disentangled Features*, B.U. Dept. of Computer Science (second reader).

48. Vitali Petsiuk, May 2024, *Neural Network Interpretations as Means for Model Analysis and Improvement*, B.U. Dept. of Computer Science (second reader).

Master's Thesis, Advisor:

1. Romer Rosales, *Tracking Moving Objects in Unconstrained Environments*, Dec. 1999.

2. John Isidoro, *Active Blobs and Their Applications*, Dec. 1999.

3. Saratendu Sethi, *Combinations of Deformable Prototypes*, May 2000.

4. Jonathan Alon, *Nonrigid Shape from Image Streams*, Dec. 2000.

5. Matheen Siddiqui, *Surface Reconstruction from Multiple Views Using Rational B-Splines*, Dept. of Electrical and Computer Engineering, Boston University, Dec. 2001.

6. Luke Skelly, *Rotation Invariant 3D Feature Description*, May 2007.

7. Alexandra Stefan, *Indexing Methods For Efficient Multiclass Recognition*, Sep. 2008.

8. Ramazan Gokberk Cinbis, *Nonparametric Context Model for Object Recognition*, Sep. 2010.

9. Kun He, *Stochastic Functional Descent for Learning Support Vector Machines*, Aug. 2013.

10. Ajjen Joshi, *Recognition of Aircraft Flight Director Gestures*, Sep. 2014.

Master's Thesis, Examining Committee Member:

1. Johanna Brewer, *Real-time 4D Tumor Tracking and Modeling from Internal and External Fiducials in Fluoroscopy*, Sep. 2004 (second reader).
2. Stephen Crampton, *Counting Fingers in Real Time using Computer-Vision Techniques*, May 2004 (second reader).
3. John Magee, *A Real-Time Human-Computer Interface Based on Gaze Detection from a Low-Grade Video Camera*, May 2004 (second reader).
4. Mykhaylo Burenkov, *Adaptive and Feature Sensitive Registration and Reconstruction of Surfaces from Laser Range Data*, Dec. 2004 (second reader).
5. Angshuman Bagchi, *A Clustered Data Association Technique for Expedited Multi Target Tracking*, Jun. 2006 (second reader).
6. Panagiotis Papapetrou, *Constraint-based Mining of Frequent Arrangements of Temporal Intervals*, Sep. 2006 (second reader).
7. Lisa Premerlani, *Infrared Image Analysis and Video Tracking of Bats*, May 2007 (second reader).
8. Wajeeha Akram, *Designing and Evaluating Computer Vision Based Interfaces for Users with Disabilities*, Sep. 2007 (second reader).
9. Michalis Potamias, *Indexing Distances in Large Graphs and Applications in Search Tasks*, Dec. 2008 (second reader).
10. Seule Ki Kim, *Integrating Computer Vision Techniques into a Touchpad System*, May 2013 (second reader).
11. Wenxin Feng, *Selection Mechanism and Interface Study for Camera-Based Mouse-Replacement System*, May 2014 (second reader).

Master's Project, Advisor:

1. Siripong Kaewyou, *Using Wavelet Compression for Efficient, Multiresolution, Polygonal Display of 3D Terrain Data*, Sep. 1995.
2. Hani Mawlawi, *Graphics User Interface for Image Database Querying: Query by Sketch (QBS)*, Sep. 1996.
3. Leonid Taycher, *Image Feature Extraction Subsystem of the ImageRover WWW Image Search System*, Sep. 1997.
4. Leonid Sigal, *Estimation and Prediction of Evolving Color Distributions for Skin Segmentation Under Varying Illumination*, Sep. 1999.
5. Witold Stankiewicz, *Predictable Geomorphing*, May 2003.
6. Dan Buzan, *Robust Tracking of Human Motion*, May 2003.
7. Jing Zhong, *An Algorithm for Segmenting Foreground Objects from a Dynamic Textured Backgrounds*, Dec. 2003.
8. Benjamin Ring, *Single View Scene Reconstruction from Detected Vanishing Points*, May 2006.
9. Szu Han Chang and Michael Mallon, *Predicting the Stock Market through Preprocessing Historical Data via an Expert System as Input to a Time-Delay Artificial Neural Network*, May 2008.
10. Charalampos Fligkos, *Real Time Face Model Animation for Game Development Using the Kinect*, May 2012.
11. Rufat Mammadyarov, *Computer Vision Methods for Estimation of the Lecture's Location and Pose in the Classroom*, May 2012.

12. Rob Truxler, *MapReduce Markov Random Fields for Parallel Land Classification*, January 2013.

13. Jun Xu, *Newborn recognition using ear biometrics controlling for growth pattern*, May 2016 (coadvised with Margrit Betke and Christopher Gil).

Senior Honor's Thesis, Advisor:

1. Matheen Siddiqui, *Calibration and Its Application to Stereo*, Dec. 1999, Dept of Electrical and Computer Engineering.

2. Eric Negron, *A Hybrid Macro-System for Visual Programming by Example*, May 1996.

3. Natasha Tatarchuk, *Algorithms for Automatic Creation and Selection of Nonphotorealistic Rendering of Images via a Design Gallery Environment*, May 1997.

Senior Honor's Thesis, Reader:

1. Diane E. Hirsh, *Evaluation of Computer Vision Methods for Analysing Infrared Thermal Video and Censusing Brazilian Free-tailed Bats*, May 2004.

Undergraduate Research Opportunities (UROP), Advisor:
Dan Baker (F99), Kevin Mader (S06), Lourdes Martinez (S00–S01), Yannis Minadakis (F99), Kyle Olszeksi (S06), Maria Shugrina (co-advisor S06), Leon Sigal (S97–S99), Matheen Siddiqui (F98–F99), Ben Waber (co-advisor S04), Eric Cornelius (S08), Jon Suen (co-advisor S08-F08).

Departmental Service:
Chair, Dept. of Computer Science, 2007–2013.
Associate Chair, Dept. of Computer Science, 05/06 and 06/07 academic years.
Director of Graduate Studies, Dept. of Computer Science, 03/04 and 04/05 academic years.
Chair, Departmental Graduate Admissions Committee, 00/01 and 01/02 academic years.
Chair, Faculty Search Committee, 96/97 academic year.
Member, Faculty Search Committee, 97/98, 98/99, 99/00, 01/02, 14/15 academic years.
Member, Departmental equipment committee, 96/97 – 04/05 academic years (chair 99/00 – 00/01).
Coordinator, computer science research lab construction, 96/97 academic year.
Member, *ad hoc* committee on new building, 99/00 academic year.
Member, *ad hoc* committee to propose new College computer graphics teaching lab, 96/97 academic year.
Member, Departmental Merit Review Committee, 96, 98, and 05 (chair 05).
Departmental GAANN Scholarship Committee, 95/96 academic year.

College Service:
Dean *ad interim*, College of Arts & Sciences, 2018 – 2019.
Associate Dean of the Faculty, Mathematical & Computational Sciences, College of Arts & Sciences, 2015 – 2018.
Chair, Promotion Committee for Senior and Master Lecturers, College of Arts & Sciences, 09/10 and 10/11 academic years.
Chair, Task Force on Senior and Master Lecturers, College of Arts & Sciences, 08/09 academic year.
Chair, Academic Policy Committee, College of Arts & Sciences, 06/07 academic year.
Member, Academic Policy Committee, College of Arts & Sciences, 14/15 and 04/05 – 06/07 academic years.
Member, Appointment, Promotion, and Tenure Committee, College of Arts & Sciences, 03/04 academic year.

University Service:
Member, University Library Vision Steering Committee, 2023-2024.
Member, Presidential Search Committee, 2022-2023.
Member, Community Health Organization Group, 2020-2022.
Member, Steering Committee for Strategic Plan Implementation, 2020-2021.
Member, Diversity and Inclusion Advisory Council, 2018–2020.
Member, Task Force on Data Science, 2018–2019.
Member, Committee on Data Science in Genomics and Epidemiology, 2017–2018.
Member, General Education Implementation Task Force, 2016–2018.

Member, Provost's Search Advisory Committee for Associate Provost of Diversity and Inclusion Search, 2016–2017.
Member, BK1 Building Planning Committee, 2011–2018.
Member, Steering Committee, Data Science Initiative, 2015–present.
Member, Provost's Search Advisory Committee for College of Arts and Sciences Dean Search, 2014 – 2015.
Member, Provost's Course Credit Definition Committee, 2012–2015.
Member, IS&T Support and Infrastructure Governance Committee, 2010–2013.
Faculty Advisor, BU Women in Computer Science (WiCS) Club, 2012–2013, 2015–2016.
Faculty Advisor, BU Student Computer Graphics Club, 1996–2006.

Grants, Principal Investigator:

1. *An Atlas of the Human Brain*, subcontract to Brigham and Women's Hospital on NIH and Radiology Foundation grants, 1/1/95 – 8/31/97, $52,857.

2. *Shape and Motion Categorization for Content-based Image and Video Database Search*, Office of Naval Research, Young Investigator Award, 6/1/96 – 5/31/99, $377,461.

3. *Deformable Shape Models for Image Understanding*, NSF Faculty Early Career Development Award, 6/1/96 – 5/31/00, $204,500.

4. *Research Infrastructure for Parallel and Distributed Systems: Real-time, Multimedia, and High-Performance*, with five co-principal investigators, NSF CISE, 7/1/96 – 6/30/01, $874,019.

5. *Person Spotting in Video*, Digital Equipment Corporation, 3/1/98 – 8/31/98, $20,733.

6. *Unified Shape, Appearance, and Motion Representation for Content-Based Video Retrieval*, Office of Naval Research, 10/1/99 – 9/30/02, $300,000.

7. *Lab Upgrade for Machine Vision Research and Research-Related Education*, with Margrit Betke, Office of Naval Research, 04/01/01 – 03/31/02, $195,000.

8. *Surface Estimation of Nonrigid and Articulated Objects*, Mitsubishi Electronic Research Laboratories (gift), 04/01/01, $30,000.

9. *Estimating and Recognizing 3D Articulated Motion via Uncalibrated Cameras*, with Vladimir Pavlovic (Rutgers), NSF CISE IIS/RHA, 08/01/02 – 07/31/06, $403,416.

10. *Discovering, indexing, retrieving, and exploiting motion patterns in video databases*, Office of Naval Research, 10/01/02 – 9/30/05, $300,000.

11. *Mining and Indexing Spatio-Temporal Patterns in Video Databases of Human Motion*, with Margrit Betke and George Kollios, NSF CISE IIS/IDM, 09/15/03 – 09/14/07, $405,000.

12. *GAANN Fellowships for Strategic Areas of Computer Science*, with 12 co-principal investigators, U.S. Dept. of Education 09/01/04 – 08/31/08, $622,665.

13. *Analysis of Articulated Human Motion in Video*, MIT/Lincoln Labs, 01/01/06 – 04/30/06, $31,108.

14. *Parameter-Sensitive and Dynamics-Aware Methods for Object Detection, Pose Estimation, and Tracking*, NSF CISE RI, 08/01/07 – 07/31/10, $387,816.

15. *Large Lexicon Gesture Representation, Recognition, and Retrieval*, with Carol Neidle (BU), and Vassilis Athitsos (UT Arlington), NSF CISE HCC, 09/01/07 – 08/31/10, $899,985.

16. *II-EN: Infrastructure for Gesture Interface Research Outside the Lab*, with Carol Neidle and Margrit Betke, NSF CISE CRI, 09/01/09 – 08/31/13, $591,445.

17. *Human Action-Based Video Summarization*, with Nazli Ikizler-Cinbis (Hacettepe U), Google Faculty Research Award, 09/01/07 – 08/31/10, $75,000 (total).

18. *Collaborative Research: Computational Behavioral Science: Modeling, Analysis, and Visualization of Social and Communicative Behavior*, NSF Expeditions in Computing Program, collaborative project involving GA Tech (lead), CMU, MIT, UIUC, and USC, 09/01/10 – 08/31/17, award to B.U.: $749,047.

Grants, Co-Principal Investigator:

1. *GAANN Fellowships for Strategic Areas of Computer Science: High Performance Communication and Multimedia Computing*, with five other co-principal investigators, US Department of Education, 9/1/1995 – 8/31/1998, $354,645.

2. *Real-time, Multimedia and High Performance Computing in Distributed Systems*, with four other co-principal investigators, NSF Instrumentation Grants for Research in Computer and Information Science and Engineering, 2/15/1996 – 1/31/1997, $142,744.

3. *National Center for Sign Language and Gesture Resources*, with Carol Neidle, NSF CISE, 9/1/98 – 9/30/03, $650,000. Joint project with Dimitris Metaxas (Rutgers).

4. *Essential Tools for Computational Research on Visual-Gestural Language Data*, with Carol Neidle, NSF CISE, 06/01/00 – 05/31/03, $682,602.

5. *SENSORIUM: Research Infrastructure for Managing Spatio-Temporal Objects in Video Sensor Networks*, NSF CISE EIA, with six other co-principal investigators, 9/1/02 – 8/31/07, $1,187,603.

6. *Sensors and Methods to Handle UAV*, subcontract to Charles River Analytics, Inc., on Navy STTR phase I contract, 08/01/03 – 04/30/04, $33,281.

7. *Video Analysis for Nighttime Surveillance and Situatational Awareness*, subcontract to Charles River Analytics, Inc., on DARPA STTR phase I contract, 09/01/03 – 08/30/04, $30,055.

8. *Pattern Discovery in Signed Languages and Gestural Communication*, NSF CISE, with Carol Neidle, Margrit Betke, George Kollios, and Robert Gips (Boston College), 10/1/03 – 9/30/07, $750,000.

9. *Video Analysis for Nighttime Surveillance and Situatational Awareness*, subcontract to Charles River Analytics, Inc., on DARPA STTR phase II contract, 09/01/04 – 10/31/07, $250,000.

10. *Anthropometric Modeling and Automatic Pose Reconstruction*, subcontract to Charles River Analytics, Inc., on Air Force SBIR phase I contract, 03/31/09 – 12/23/09, $25,101.

11. *HCC: Large: Intelligent Tracking Systems that Reason about Group Behavior*, NSF CISE IIS, with Margrit Betke (PI), Joyce Wong, and Tom Kunz, 09/1/09 – 08/31/14, $2,858,292.

12. *Collaborative Research: II-EN: Development of Publicly Available, Easily Searchable, Linguistically Analyzed, Video Corpora for Sign Language and Gesture Research* , NSF CISE CRI, with Carol Neidle (PI), 04/1/10 – 03/31/11, $70,000.

13. *Person Tracking and Following for Mobile Robotics*, subcontract to Charles River Analytics, Inc., on Army SBIR phase I contract, 09/20/10 – 03/20/11, $31,730.

14. *Collaborative Research: CI-ADDO-EN: Development of Publicly Available, Easily Searchable, Linguistically Analyzed, Video Corpora for Sign Language and Gesture Research*, NSF CISE CRI, with Carol Neidle (PI), 08/1/11 – 07/31/17, $368,205.

15. *Person Tracking and Following for Mobile Robotics*, subcontract to Charles River Analytics, Inc., on Army SBIR phase II contract, 10/01/11 – 09/30/13, $233,914.

16. *Taxiing Operations via Gesture Understanding (TOPGUN)*, subcontract to Charles River Analytics, Inc., on Navy SBIR phase I contract, 03/01/13 – 02/22/14, $37,327.

17. *INT: Collaborative Research: Detecting, Predicting and Remediating Student Affect and Grit Using Computer Vision*, NSF IIS, with Margrit Betke (PI), 09/1/16 – 08/31/20, $614,990.

18. *ALERT: Tracking Passengers and Divested Objects*, TSA / Northeastern University, with Venkatesh Saligrama (PI), 01/1/17 – 05/31/18, $160,000.

19. *Deep Intermodal Video Analytics (DIVA)*, with Kate Saenko (PI), 2017-2019, $750,000.

20. *Airborne Video Inspection for Automatic Targeting with Ontology Reasoning (AVIATOR)*, subcontract to Charles River Analytics, Inc., on AFOSR STTR phase I contract, 01/01/19 – 10/22/19, $42,125.