

<http://www.cs.uml.edu/~saenko/>

Research Interests: adaptive machine learning, learning for joint vision and language understanding

EDUCATION

University of British Columbia, Vancouver, Canada	Computer Science	B.Sc., 2000
Massachusetts Institute of Technology, Cambridge, USA	EECS	M.Sc., 2004
Massachusetts Institute of Technology, Cambridge, USA	EECS	Ph.D., 2009

ACADEMIC APPOINTMENTS

University of Massachusetts, Lowell	Assistant Professor	9/2012-present
Harvard University, SEAS	Associate in Computer Science	9/2012-present
UC Berkeley EECS	Visiting Scholar	9/2009-8/2012
International Computer Sciences Institute	Postdoctoral Researcher	9/2009-8/2012
Harvard University, SEAS	Postdoctoral Fellow	9/2009-8/2012
MIT CSAIL	Research Assistant	9/2002-8/2009
MIT EECS	Teaching Assistant	2007

GRANTS

- **Google Research Award:** *Natural Language Video Description using Deep Recurrent Neural Networks*, PI at UML, 2015, \$23,500.
- **NGA:** *Adaptive Neural Networks for Geospatial Image Analysis*, PI at UML, Sep 2015, Award Amount: \$209,000.
- **AFRL:** *Efficient Large-Scale CNN-enabled Semantic Segmentation of Videos*, PI at UML, Start Date: May 2015, Award Amount: \$100,000.
- **NSF:** *AitF: FULL: Collaborative Research: PEARL: Perceptual Adaptive Representation Learning in the Wild*; PI at UML, Start Date: 09/2015; \$200,000.
- **NSF:** *REU Site: HCISec - Enhancing Undergraduate Research in Modern Human Computer Interaction Security and Privacy*; Award Number: 1461060; PI:Xinwen Fu; Co-PI:Kate Saenko, UML; Start Date:06/01/2015; \$249,677.
- **NSF:** *EAGER: Quantifying and Reducing Data Bias in Object Detection Using Physics-based Image Synthesis*; PI at UML. Start Date: 09/01/2014; \$185,875.
- **NSF:** *CI-New: Collaborative Research: Federated Data Set Infrastructure for Recognition Problems in Computer Vision*. PI at UML: 2014-2015; \$60,000.
- **NSF:** *RI: Large: Collaborative Research: Reconstructive Recognition: Advancing computer vision by uniting statistical scene understanding and physics-based visual reasoning*, PI at UML. 2012-17; \$400,000.
- **DARPA:** *Mind's Eye: Recognizing Activities with Probabilistically Grounded Visual Intelligence Models*, as Co-PI at ICSI: 2010-13; \$200,000/yr. PI at UML: 2012-14; \$277,000.
- **Toyota:** *Visual Object Recognition for Practical Assistance Robots*, Co-PI at ICSI, Berkeley; 2010-12; \$250,000/yr.

TEACHING

- **Data Science Option for Computer Science B.Sc.** UML CS, 2015-
Proposed and implemented a new program of study called the Data Science Option. The option allows Computer Science majors to gain the additional knowledge necessary to become a data scientist, and consists of 4 required and 2 elective courses.

- **COMP 4230, COMP 5320 Computer Vision I**, Instructor UML CS, 2012-2015
Developed and taught a new grad/ugrad course. The course covers introductory topics in computer vision and image processing through lectures, programming assignments and a final project.
- **COMP 4540, COMP 5450 Machine Learning**, Instructor UML CS, 2013-2016
Developed and taught a new grad/ugrad course in Machine Learning. The course offers an introduction to the subject through lectures, programming assignments, in-class quizzes, exams and a final project.
- **Science Club for Girls**, Volunteer Mentor Scientist Cambridge, MA, 2010
Led a once-per-week after-school club for 5th grade girls in Cambridge public school, along with two other mentor scientists. Planned and conducted hand-on rocket science experiments to encourage the girls' interest in science careers.
- **Intelligent Multimodal Interfaces**, Graduate Teaching Assistant MIT EECS, 2007
Helped develop a new multi-disciplinary graduate course on Intelligent Multimodal Interfaces. Created and graded assignments, prepared and gave guest lectures.
- **MATH101**, Undergraduate Teaching Assistant UBC Math Dept., 1997,1999
Supervised and graded exams and homework assignments for first-year calculus courses. Provided one-on-one tutoring in calculus to the students.

AWARDS

- **Teaching Excellence Award**, UMass Lowell Computer Science Department 2015
- **Best Paper Prize**, TASK-CV Workshop: Transferring and Adapting Source Knowledge in Computer Vision, at the International Conf. on Computer Vision 2015
- **Best Paper Prize**, Domain Adaptation Workshop: Theory and Application, NIPS 2011
- **Mentor Award**, Science Club for Girls, Cambridge, MA 2010
- **Best Student Paper Award**, International Conference on Multimodal Interfaces 2006
- **Postgraduate Scholarship**, Canadian Natural Sciences and Engineering Research Council 2000
- **Canadian Premier's Award for Young Women in Science** 1999
- **Honorable Mention in the CRA's Outstanding Undergraduate Award** 1998

INTERNSHIPS

- **Mitsubishi Electric Research Laboratories (MERL)** Cambridge, MA
Research Intern (May 2005 – Aug 2005)
Worked with Prof. Candy Sidner investigating human-robot engagement for hosting activities. Implemented algorithms for face detection and tracking on a mobile robot.
- **Advanced Telecommunications Research Intl.** Kyoto, Japan
Student Researcher (Jun 1998 – Dec 1998)
Conducted research in the area of speech synthesis. Improved speech databases for a concatenative speech synthesis system (CHATR).
- **UBC Computer Science Department** Vancouver, BC
Undergraduate Research Assistant (Jan 1998 – May 1998)
Worked on a research project in the field of performance prediction for object-oriented frameworks and libraries. Researched scientific literature and implemented algorithms in Java. Supervised by Prof. Gail Murphy.

- **Redback Networks, Inc.** **San Jose, CA**
Software Developer, SmartEdge 800 (Jul 2000 – Aug 2002)
Designed and implemented network protocols, system infrastructure, and software redundancy features in an embedded programming environment using C for NetBSD and VxWorks.
- **Motorola Inc.** **Richmond, BC**
Software Developer (May 1999 – Aug 1999)
Developed test tools and designed test cases for GPRS wireless network protocol software in a team environment.
- **Newbridge Networks Corporation** **Burnaby, BC**
Software Engineer (Jan 1997 – Aug 1997)
Designed, wrote and packaged software using Object Oriented design techniques in C++. Researched the latest in network security technology. Produced a security model for a distributed object system based on CORBA.

PROFESSIONAL ACTIVITIES

- Publications Co-Chair, CVPR 2016
- Demos and Exhibits Co-chair, CVPR 2015
- Area Chair: ICCV, 2015, CVPR 2016
- Co-organizer of the [tutorial at CVPR 2012](#) on Domain Transfer Learning for Vision Applications
- Co-organizer of workshops: TASK-CV Workshop, ECCV 2014; Workshop on Visual Domain Adaptation (VisDA), ICCV 2013; [Workshop on Integrating Language and Vision](#), at NIPS, 2011; 6th [Workshop for Women in Machine Learning](#), at NIPS, 2010; The 2006 Johns Hopkins 2006 Summer Workshop on articulatory feature-based speech recognition ([final report](#))
- Reviewer for conferences: CVPR, ECCV, ICCV, NIPS
- Reviewer for journals: *Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, *IEEE International Journal of Computer Vision (IJCV)*, *Journal of Machine Learning Research (JMLR)*, *IEEE Transactions on Multimedia*
- Volunteer mentor for [Science Club for Girls](#) in Cambridge, MA
- Session chair for the [3rd CSAIL Student Workshop, 2007](#), Gloucester, MA

COLLABORATORS

- **Collaborators and Co-Editors:** Trevor Darrell (UC Berkeley), Bill Freeman (MIT), Mario Fritz (Max-Planck-Institut für Informatik), Brian Kulis (OSU), Daphne Koller (Stanford), Fei-Fei Li (Stanford), Jitendra Malik (Berkeley), Raymond Mooney (UT Austin), Marshall Tappen (UCF), Tinne Tuytelaars (K.U.Leuven), Todd Zickler (Harvard)
- **Graduate and Postdoctoral Sponsors:** Trevor Darrell (UCB/ICSI), PhD advisor, Jim Glass (MIT), MS advisor, Todd Zickler (Harvard), postdoc advisor
- **Thesis Advisor and Postgraduate-Scholar Sponsor:** Brigit Schroeder, Vasili Ramanishka, Baochen Sun, Huijuan Xu, XingChao Peng (UMass Lowell PhD students); Judy Hoffman (Berkeley PhD student co-advised); Karim Ali; Abir Das (UMass Lowell Postdocs)

PUBLICATIONS

Google Scholar profile (estimated citation count: 1975)
<http://scholar.google.com/citations?user=9xDADY4AAAAJ>

Refereed Journal, Conference and Workshop Articles

- [1] Darrell, T., Saenko, K., Hoffman, J., "Dagstuhl Summary Paper". In: Machine Learning with Interdependent and Non-identically Distributed Data (Dagstuhl Seminar 15152) (2015).
- [2] Donahue, J., Hendricks, L. A., Guadarrama, S., Rohrbach, M., Venugopalan, S., Saenko, K., Darrell, T., "Long-term recurrent convolutional networks for visual recognition and description". In: CVPR (2015).
- [3] Guadarrama, S., Rodner, E., Saenko, K., Darrell, T., "Understanding object descriptions in robotics by open-vocabulary object retrieval and detection". In: The International Journal of Robotics Research (2015).
- [4] Hoffman, J., Pathak, D., Darrell, T., Saenko, K., "Detector Discovery in the Wild: Joint Multiple Instance and Representation Learning". In: CVPR (2015).
- [5] Mrowca, D., Rohrbach, M., Hoffman, J., Hu, R., Saenko, K., Darrell, T., "Spatial Semantic Regularisation for Large Scale Object Detection". In: Proceedings of the IEEE International Conference on Computer Vision. 2015, pp. 2003-2011.
- [6] Peng, X., Sun, B., Ali, K., Saenko, K., "Learning Deep Object Detectors From 3D Models". In: Proceedings of the IEEE International Conference on Computer Vision. 2015, pp. 1278-1286.
- [7] Peng, X., Sun, B., Ali, K., Saenko, K., "What Do Deep CNNs Learn About Objects?" In: International Conference on Representation Learning (ICLR) Workshop Track (2015).
- [8] Sun, B., Feng, J., Saenko, K., "Return of Frustratingly Easy Domain Adaptation". In: In Proceedings of AAAI (2015).
- [9] Sun, B., Peng, X., Saenko, K., "Generating Large Scale Image Datasets from 3D CAD Models". In: CVPR 2015 Workshop on The Future of Datasets in Vision (2015).
- [10] Sun, B., Saenko, K., Subspace Distribution Alignment for Unsupervised Domain Adaptation. Vol. 2. British Machine Vision Conference, 2015.
- [11] Tzeng, E., Hoffman, J., Darrell, T., Saenko, K., "Simultaneous deep transfer across domains and tasks". In: Proceedings of the IEEE International Conference on Computer Vision. 2015, pp. 4068-4076.
- [12] Venugopalan, S., Rohrbach, M., Donahue, J., Mooney, R., Darrell, T., Saenko, K., "Sequence to Sequence Video to Text". In: ICCV (2015).
- [13] Venugopalan, S., Xu, H., Donahue, J., Rohrbach, M., Mooney, R., Saenko, K., "Translating videos to natural language using deep recurrent neural networks". In: HLT NAACL (2015).
- [14] Xu, H., Venugopalan, S., Ramanishka, V., Rohrbach, M., Saenko, K., "A Multi-scale Multiple Instance Video Description Network". In: ICCV 2015 Workshop on Closing the Loop between Vision and Language (2015).
- [15] Ali, K., Saenko, K., "Confidence-rated multiple instance boosting for object detection". In: Computer Vision and Pattern Recognition (CVPR), 2014 IEEE Conference on. IEEE. 2014, pp. 2433-2440.

- [16] Chakrabarti, A., Xiong, Y., Sun, B., Darrell, T., Scharstein, D., Zickler, T., Saenko, K., "Modeling Radiometric Uncertainty for Vision with Tone-Mapped Color Images". In: Pattern Analysis and Machine Intelligence, IEEE Transactions on 36.11 (2014), pp. 2185-2198.
- [17] Goehring, D., Hoffman, J., Rodner, E., Saenko, K., Darrell, T., "Interactive adaptation of real-time object detectors". In: Robotics and Automation (ICRA), 2014 IEEE International Conference on. IEEE. 2014, pp. 1282-1289.
- [18] Guadarrama, S., Rodner, E., Saenko, K., Zhang, N., Farrell, R., Donahue, J., Darrell, T., "Open-vocabulary object retrieval". In: Robotics: Science and Systems (2014).
- [19] Hoffman, J., Darrell, T., Saenko, K., "Continuous manifold based adaptation for evolving visual domains". In: Computer Vision and Pattern Recognition (CVPR), 2014 IEEE Conference on. IEEE. 2014, pp. 867-874.
- [20] Hoffman, J., Guadarrama, S., Tzeng, E. S., Hu, R., Donahue, J., Girshick, R., Darrell, T., Saenko, K., "LSDA: Large scale detection through adaptation". In: Advances in Neural Information Processing Systems. 2014, pp. 3536-3544.
- [21] Hoffman, J., Guadarrama, S., Tzeng, E., Donahue, J., Girshick, R., Darrell, T., Saenko, K., From large-scale object classifiers to large-scale object detectors: An adaptation approach. NIPS, 2014.
- [22] Hoffman, J., Rodner, E., Donahue, J., Kulis, B., Saenko, K., "Asymmetric and Category Invariant Feature Transformations for Domain Adaptation". In: International Journal of Computer Vision 109.1-2 (2014), pp. 28-41.
- [23] Schroeder, B., Sun, B., Saenko, K., Ali, K., Deconstructing the Deformable Parts Model: Do More with Less. ECCV Workshop on Parts and Attributes. 2014.
- [24] Sun, B., Saenko, K., "From virtual to reality: Fast adaptation of virtual object detectors to real domains". In: Proceedings of the British Machine Vision Conference. BMVA Press (2014).
- [25] Thomason, J., Venugopalan, S., Guadarrama, S., Saenko, K., Mooney, R., "Integrating language and vision to generate natural language descriptions of videos in the wild". In: Proceedings of the 25th International Conference on Computational Linguistics (COLING), August (2014).
- [26] Donahue, J., Hoffman, J., Rodner, E., Saenko, K., Darrell, T., "Semi-supervised domain adaptation with instance constraints". In: Computer Vision and Pattern Recognition (CVPR), 2013 IEEE Conference on. IEEE. 2013, pp. 668-675.
- [27] Guadarrama, S., Krishnamoorthy, N., Malkarnenkar, G., Venugopalan, S., Mooney, R., Darrell, T., Saenko, K., "Youtube2text: Recognizing and describing arbitrary activities using semantic hierarchies and zero-shot recognition". In: Computer Vision (ICCV), 2013 IEEE International Conference on. IEEE. 2013, pp. 2712-2719.
- [28] Huang, K., Ding, X., Chen, G., Saenko, K., "Automatic mobile photo tagging using context". In: TENCON 2013-2013 IEEE Region 10 Conference (31194). IEEE. 2013, pp. 1-5.
- [29] Janoch, A., Karayev, S., Jia, Y., Barron, J. T., Fritz, M., Saenko, K., Darrell, T., "A category-level 3d object dataset: Putting the kinect to work". In: Consumer Depth Cameras for Computer Vision. Springer London, 2013, pp. 141-165.
- [30] Krishnamoorthy, N., Malkarnenkar, G., Mooney, R., Saenko, K., Guadarrama, S., "Generating natural-language video descriptions using text-mined knowledge". In: NAACL HLT 2013 (2013), p. 10.

- [31] McCann, E., Medvedev, M., Brooks, D. J., Saenko, K., "Off the grid: Self-contained landmarks for improved indoor probabilistic localization". In: Technologies for Practical Robot Applications (TePRA), 2013 IEEE International Conference on. IEEE. 2013, pp. 1-6.
- [32] Hoffman, J., Kulis, B., Darrell, T., Saenko, K., "Discovering latent domains for multisource domain adaptation". In: ECCV 2012. Springer Berlin Heidelberg, 2012, pp. 702-715.
- [33] Packer, B., Saenko, K., Koller, D., "A combined pose, object, and feature model for action understanding." In: CVPR. 2012, pp. 1378-1385.
- [34] Xiong, Y., Saenko, K., Darrell, T., Zickler, T., "From pixels to physics: Probabilistic color derendering". In: Computer Vision and Pattern Recognition (CVPR), 2012 IEEE Conference on. IEEE. 2012, pp. 358-365.
- [35] Hoffman, J., Saenko, K., Kulis, B., Darrell, T., "Domain adaptation with multiple latent domains". In: NIPS Domain Adaptation Workshop (2011).
- [36] Kulis, B., Saenko, K., Darrell, T., "What you saw is not what you get: Domain adaptation using asymmetric kernel transforms". In: Computer Vision and Pattern Recognition (CVPR), 2011 IEEE Conference on. IEEE. 2011, pp. 1785-1792.
- [37] Owens, T., Saenko, K., Chakrabarti, A., Xiong, Y., Zickler, T., Darrell, T., "Learning object color models from multi-view constraints". In: Computer Vision and Pattern Recognition (CVPR), 2011 IEEE Conference on. IEEE. 2011, pp. 169-176.
- [38] Saenko, K., Karayev, S., Jia, Y., Shyr, A., Janoch, A., Long, J., Fritz, M., Darrell, T., "Practical 3-d object detection using category and instance-level appearance models". In: Intelligent Robots and Systems (IROS), 2011 IEEE/RSJ International Conference on. IEEE. 2011, pp. 793-800.
- [39] Tuytelaars, T., Fritz, M., Saenko, K., Darrell, T., "The NBNN kernel". In: Computer Vision (ICCV), 2011 IEEE International Conference on. IEEE. 2011, pp. 1824-1831.
- [40] Fritz, M., Saenko, K., Darrell, T., "Size matters: Metric visual search constraints from monocular metadata". In: Advances in Neural Information Processing Systems. 2010, pp. 622-630.
- [41] Saenko, K., Kulis, B., Fritz, M., Darrell, T., "Adapting visual category models to new domains". In: Computer Vision-ECCV 2010. Springer Berlin Heidelberg, 2010, pp. 213-226.
- [42] Saenko, K., Darrell, T., "Filtering abstract senses from image search results". In: Advances in Neural Information Processing Systems. 2009, pp. 1589-1597.
- [43] Saenko, K., Darrell, T., "Unsupervised learning of visual sense models for polysemous words". In: Advances in Neural Information Processing Systems. 2009, pp. 1393-1400.
- [44] Saenko, K., Livescu, K., Glass, J., Darrell, T., "Multistream articulatory feature-based models for visual speech recognition". In: Pattern Analysis and Machine Intelligence, IEEE Transactions on 31.9 (2009), pp. 1700-1707.
- [45] Saenko, K., Darrell, T., "Object category recognition using probabilistic fusion of speech and image classifiers". In: Machine Learning for Multimodal Interaction. Springer Berlin Heidelberg, 2008, pp. 36-47.
- [46] Hasegawa-Johnson, M., Livescu, K., Lal, P., Saenko, K., "Audiovisual speech recognition with articulator positions as hidden variables". In: Proc. International Congress of Phonetic Sciences (ICPhS) (2007).

- [47] Livescu, K., Cetin, O., Hasegawa-Johnson, M., King, S., Bartels, C., Borges, N., Kantor, A., Lal, P., Yung, L., Bezman, A., "Articulatory feature-based methods for acoustic and audio-visual speech recognition: 2006 JHU summer workshop _nal report (Tech. Rep. No. WS06)". In: Johns Hopkins University Center for Language and Speech Processing (2007).
- [48] Livescu, K., Cetin, O., Hasegawa-Johnson, M., King, S., Bartels, C., Borges, N., Kantor, A., Lal, P., Yung, L., Bezman, A., "Articulatory feature-based methods for acoustic and audio-visual speech recognition: Summary from the 2006 JHU summer workshop". In: Acoustics, Speech and Signal Processing, 2007. ICASSP 2007. IEEE International Conference on. Vol. 4. IEEE. 2007, pp. IV-621.
- [49] Saenko, K., Darrell, T., "Towards adaptive object recognition for situated human-computer interaction". In: Proceedings of the 2007 workshop on Multimodal interfaces in semantic interaction. ACM.2007, pp. 43-46.
- [50] Christoudias, C. M., Saenko, K., Morency, L.-P., Darrell, T., "Co-adaptation of audio-visual speech and gesture classifiers". In: Proceedings of the 8th international conference on Multimodal interfaces. ACM. 2006, pp. 84-91.
- [51] Saenko, K., Livescu, K., "An asynchronous DBN for audio-visual speech recognition". In: Spoken Language Technology Workshop, 2006. IEEE. IEEE. 2006, pp. 154-157.
- [52] Saenko, K., Livescu, K., Glass, J., Darrell, T., "Production domain modeling of pronunciation for visual speech recognition". In: Acoustics, Speech, and Signal Processing, 2005. Proceedings.(ICASSP'05). IEEE International Conference on. Vol. 5. IEEE. 2005, pp. v-473.
- [53] Saenko, K., Livescu, K., Siracusa, M., Wilson, K., Glass, J., Darrell, T., "Visual speech recognition with loosely synchronized feature streams". In: Computer Vision, 2005. ICCV 2005. Tenth IEEE International Conference on. Vol. 2. IEEE. 2005, pp. 1424-1431.
- [54] Hazen, T. J., Saenko, K., La, C.-H., Glass, J. R., "A segment-based audio-visual speech recognizer: Data collection, development, and initial experiments". In: Proceedings of the 6th international conference on Multimodal interfaces. ACM. 2004, pp. 235-242.
- [55] Saenko, K., Darrell, T., Glass, J. R., "Articulatory features for robust visual speech recognition". In: Proceedings of the 6th international conference on Multimodal interfaces. ACM. 2004, pp. 152-158.