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Education

Mar. 2011	Ph.D., Computer Science, Boston University
	Thesis: Layered Graphical Models for Tracking Partially-Occluded Moving Objects in Video
Feb. 1996	M.S., Computer Science, University of Massachusetts at Amherst
May 1992	B.A., Mathematics (cum laude with honors), Brandeis University

Professional appointments

2019 - present **University of Washington** (https://apl.uw.edu/)
Principal Research Scientist, Applied Physics Laboratory
Affiliate Assistant Professor, Electrical & Computer Engineering Dept.

2018 - 2019 **Boston University** (http://www.bu.edu/cs/ivc)
Senior Research Scientist, Image and Video Computing Group, Computer Science Dept.

2014 - 2018 **Systems & Technology Research** (http://www.stresearch.com)
Senior Member of Technical Staff, Video & Image Understanding Group

2011 - 2014 **EPFL (Swiss Federal Institute of Technology)** (http://cvlab.epfl.ch)
Post-doctoral Researcher in the Computer Vision Laboratory

2005 - 2011 **Boston University** (http://www.bu.edu/cs/ivc)
Research Assistant in the Image and Video Computing Laboratory, Computer Science Dept.

1999 - 2005 **Charles River Analytics, Inc.** (http://www.cra.com)
Senior Software Engineer, then Principal Research Engineer, Sensor Processing Division

1998 - 1999 **Cognex Corporation** (http://www.cognex.com)
Software Engineer in the Vision Tools and Applications Group

1996 - 1998 **Amerinex Applied Imaging, Inc./ADCIS, SA** (http://www.adcis.net)
Senior Software Engineer, Project Aphelion

1993 - 1996 **UMass Amherst** (http://vis-www.cs.umass.edu)
Research Assistant in the Computer Vision Laboratory, Computer Science Dept.

IEEE Senior Member.   *Citizenship: U.S.*

Publications

Refereed Journals:

1. Xinchao Wang, Vitaly Ablavsky, Horesh Ben Shitrit, and Pascal Fua. "Take your Eyes off the Ball: Improving Ball-Tracking by Focusing on Team Play," Computer Vision and Image Understanding (CVIU), Vol. 119, 2014. [PDF] [videos of results]

2. Vitaly Ablavsky and Stan Sclaroff, "Layered Graphical Models for Tracking Partially-Occluded Objects," IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI), Vol. 33(9), September 2011. [PDF] [datasets]

3. Quan Yuan, Ashwin Thangali, Vitaly Ablavsky, and Stan Sclaroff, "Learning a Family of Detectors via Multiplicative Kernels," IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI), Vol. 33(3), March 2011. [PDF] [datasets]

Refereed Proceedings:

1. Dina Bashkirova, Ziliang Zhu, James Akl, Fadi Alladkani, Ping Hu, Vitaly Ablavsky, Berk Calli, Sarah Adel Bargal, and Kate Saenko, "ZeroWaste Dataset: Towards Automated Waste Recycling," In Proc. IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2022. [PDF] [project page] [VisDA-2022 challenge]

2. Milind Naphade, Shuo Wang, David C. Anastasiu, Zheng Tang, Ming-Ching Chang, Yue Yao, Liang Zheng, Mohammed Shaiqur Rahman, Archana Venkatachalapathy, Anuj Sharma, Qi Feng, Vitaly Ablavsky, Stan Sclaroff, Pranamesh Chakraborty, Alice Li, Shangru Li, and Rama Chellappa, "The 6th AI City Challenge," In Proc. IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2022. [PDF]

3. Nataniel Ruiz, Hao Yu, Danielle Allessio, Mona Jalal, Ajjen Joshi, Thomas Murray, John Magee, Jacob Whitehill, Vitaly Ablavsky, Ivon Arroyo, Beverly Woolf, Stan Sclaroff, and Margrit Betke, "Leveraging Affect Transfer Learning for Behavior Prediction in an Intelligent Tutoring System," IEEE International Conference on Automatic Face & Gesture Recognition, 2021. [oral, best poster award] [PDF]

4. Qi Feng, Vitaly Ablavsky, Qinxun Bai, and Stan Sclaroff, "Siamese Natural Language Tracker: Tracking by Natural Language Descriptions with Siamese Trackers," In Proc. IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2021. [oral] [PDF]

5. Milind Naphade, Shuo Wang, David C. Anastasiu, Zheng Tang, Ming-Ching Chang, Xiaodong Yang, Yue Yao, Liang Zheng, Pranamesh Chakraborty, Christian E. Lopez, Anuj Sharma, Qi Feng, Vitaly Ablavsky, and Stan Sclaroff, "The 5th AI City Challenge," In Proc. IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2021. [PDF]

6. Nuno C. Garcia, Sarah Adel Bargal, Vitaly Ablavsky, Pietro Morerio, Vittorio Murino, and Stan Sclaroff, "DMCL: Distillation Multiple Choice Learning for Multimodal Action Recognition," In Proc. IEEE Winter Conference on Applications of Computer Vision (WACV), 2021. [PDF]

7. Chenhongyi Yang, Vitaly Ablavsky, Kaihong Wang, Qi Feng, and Margrit Betke, "Learning to Separate: Detecting Heavily-Occluded Objects in Urban Scenes," In Proc. European Conference on Computer Vision (ECCV), 2020. [PDF]

8. Qi Feng, Vitaly Ablavsky, Qinxun Bai, Guorong Li, and Stan Sclaroff, "Real-time Visual Object Tracking with Natural Language Description," In Proc. IEEE Winter Conference on Applications of Computer Vision (WACV), 2020. [PDF]

9. Ping Hu, Jun Liu, Gang Wang, Vitaly Ablavsky, Kate Saenko, and Stan Sclaroff, "DIPNet: Dynamic Identity Propagation Network for Video Object Segmentation," In Proc. IEEE Winter Conference on Applications of Computer Vision (WACV), 2020. [PDF]

10. Hanxiao Wang, Venkatesh Saligrama, Stan Sclaroff, and Vitaly Ablavsky, "Cost-Aware Fine-Grained Recognition for IoTs Based on Sequential Fixations," In Proc. IEEE International Conference on Computer Vision (ICCV), 2019. [PDF]

11. Vitaly Ablavsky and Stan Sclaroff, "Learning parameterized histogram kernels on the simplex manifold for image and action classification," In Proc. IEEE International Conference on Computer Vision (ICCV), 2011. [PDF]

12. Vitaly Ablavsky, Ashwin Thangali, and Stan Sclaroff, "Layered graphical models for tracking partially-occluded objects," In Proc. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2008. [PDF]

13. Quan Yuan, Ashwin Thangali, Vitaly Ablavsky, and Stan Sclaroff, "Multiplicative Kernels: Object Detection, Segmentation and Pose Estimation," In Proc. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2008. [PDF]

14. Quan Yuan, Ashwin Thangali, Vitaly Ablavsky, and Stan Sclaroff, *Parameter Sensitive Detectors*, In Proc. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2007. [PDF]

15. Daniel Gutchess, Vitaly Ablavsky, Ashwin Thangali, Stan Sclaroff and Magnús Snorrason, "Video Surveillance of Pedestrians and Vehicles," In Proc. SPIE Acquisition, Tracking, Pointing, and Laser Systems Technologies XXI, Vol. 6569, 2007.

16. Camille Monnier, Vitaly Ablavsky, Stephen Holden, and Magnús Snorrason, "Sequential Correction of Perspective Warp in Camera-based Documents," In Proc. IEEE International Conference on Document Analysis and Recognition (ICDAR), Seoul, Korea, August 2005.

17. Vitaly Ablavsky, "Background Models for Tracking Objects in Water," In Proc. IEEE International Conference on Image Processing (ICIP), Barcelona, Spain, September 2003.

18. Vitaly Ablavsky and Mark R. Stevens, "Automatic Feature Selection with Applications to Script Identification of Degraded Documents," In Proc. IEEE International Conference on Document Analysis and Recognition (ICDAR), Edinburgh, UK, pp. 750-754, August 2003.

19. Vitaly Ablavsky, Daniel Stouch, and Magnús Snorrason, "Search Path Optimization for UAVs using Stochastic Sampling with Abstract Pattern Descriptors," In Proc. AIAA Guidance Navigation and Control Conference, Austin, TX, August 2003.

20. Thomas Goodsell, Magnús Snorrason, Mark R. Stevens, Dustin Cartwright, Brian Stube, and Vitaly Ablavsky, "Sign Detection for Autonomous Navigation," In Proc. SPIE Unmanned Ground Vehicle Technology V, 2003.

21. Vitaly Ablavsky, Magnús Snorrason, and Colin J. Taylor, "RAVE: Real-time Autonomous Video Enhancement system," In Proc. IEEE International Conference on Image Processing (ICIP), Rochester, NY, September 2002.

22. Vitaly Ablavsky, Magnús Snorrason, and Stephen Holden, "Efficient Pursuit of a Moving Target via Spatial Constraint Exploitation," In Proc. AIAA Guidance, Navigation, and Control Conference, Montreal, CA, August 2001.

23. Thomas Goodsell, Magnús Snorrason, Harald Ruda, and Vitaly Ablavsky, "Navigability Evaluation and Visualization for Mars Rover Operations," In Proc. the International Conference on Visualization, Imaging and Image Processing, Marbella, Spain, July 2001.

24. Mark R. Stevens, Magnús Snorrason, Vitaly Ablavsky, and Sengvieng Amphay, "ATA Algorithm Suite for Co-Boresighted PMMW and LADAR Imagery," In Proc. SPIE, Volume 4373, AeroSense, Orlando, FL, April 2001.

25. Thomas Goodsell, Magnús Snorrason, Harald Ruda, and Vitaly Ablavsky, "Automated Obstacle Mapping and Navigability Analysis for Rover Mission Planning," In Proc. SPIE, Volume 4364, AeroSense, Orlando, FL, April 2001.

26. Thomas Goodsell, Magnús Snorrason, Harald Ruda, and Vitaly Ablavsky, "Rover Obstacle Visualizer and Navigability Evaluator," In Proc. SPIE, Volume. 4195, Photonics East, Boston, MA, November 2000.

27. Vitaly Ablavsky and Magnús Snorrason, "Optimal Search for a Moving Target: a Geometric Approach," In Proc. AIAA Guidance, Navigation, and Control Conference, Denver, CO, August 2000.

Book Chapters:

- Quan Yuan, Ashwin Thangali, Vitaly Ablavsky, and Stan 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, 2011.

Invited Papers:

- Stan Sclaroff, Ashwin Thangali, Quan Yuan, and Vitaly 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.

Miscellaneous Publications and Technical Reports:

1. Qi Feng, Vitaly Ablavsky, Qinxun Bai, and Stan Sclaroff, "Robust Visual Object Tracking with Natural Language Region Proposal Network," December 2019. arXiv:1912.02048 [PDF]

2. Vitaly Ablavsky, Carlos Becker, and Pascal Fua, "Transfer Learning by Sharing Support Vectors," Technical Report EPFL-REPORT-181360, School of Computer and Communication Sciences, Swiss Federal Institute of Technology, Lausanne (EPFL), September 2012.

3. Camille Monnier, Vitaly Ablavsky, Stephen Holden, and Magnús Snorrason, "A Document Image Enhancement Module: Perspective Warp Correction," In Proc. Symposium on Document Image Understanding Technology (SDIUT), College Park, MD, November 2005.

4. Vitaly Ablavsky, Magnús Snorrason, and Mark R. Stevens, "OCR Accuracy Prediction as a Script Identification Problem," In Proc. Symposium on Document Image Understanding Technology (SDIUT), Greenbelt, MD, April 2003.

5. Vitaly Ablavsky, Mark R. Stevens and Joshua Pollak, "Data-Structure-Independent Algorithms for Image Processing," C/C++ Users Journal, pp. 24-31, November 2003.

6. Vitaly Ablavsky, "Applying BGL to Computational Geometry," C/C++ Users Journal, pp. 6-12, August 2002.

7. Vitaly Ablavsky, Dustin Cartwright, Magnús Snorrason, Mark R. Stevens, and Joshua Pollak, "ISIS: Intelligent Surveillance and Intrusion Detection for Ships," Final Technical Report R02131, Charles River Analytics Inc., Cambridge, MA, October 2002.

8. Magnús Snorrason, Vitaly Ablavsky, and Colin J. Taylor, "Passive Millimeter-Wave and Laser-Radar Autonomous Target Acquisition," Final Technical Report R99079, Charles River Analytics Inc., Cambridge, MA, January 2000.

Grants Won

Principal Investigator / co-PI

1. "Panoramic Asset Tracking of Real-Time Information for the Ouija Tabletop,"
   NAVSEA/ONR Phase I, June 2020 - September 2020, $55,000
   Phase II, April 2021 - September 2021, $50,000

2. "Collaborative Research: Shared Autonomy for the Dull, Dirty, and Dangerous: Exploring Division of Labor for Humans and Robots to Transform the Recycling Sorting Industry,"
   NSF 19-541, 9/1/2019 - 8/31/2022, $375,000

3. "Threat Detection Using Artificial Intelligence and Machine Learning,"
   Air Force SBIR AF172-010 Phase 1, 12/21/2017 - 7/20/2018, $150,000
   Project subsequently awarded two concurrent Phase II awards: $1.5M

4. "Non-Uniformity Correction Algorithm Suite (NUCAS),"
   DoD Army SBIR A04-125 Phase I, 12/14/2004 - 6/14/2005, $118,683

5. "Sensors and Methods to Handle UAV,"
   DoD Navy STTR N03-T003 Phase I, 7/1/2003 - 4/30/2004, $69,690
   (Collaboration with Boston University)

Key Team Contributor

1. "Deep Intermodal Video Analytics (DIVA),"
   IARPA BAA-16-13 Phase I, 9/2017 - 3/2019, $3.1 million
   (Contributed to assembling multi-university team and to writing the proposal.
   Task Lead on funded project)

2. "Video Analysis for Nighttime Surveillance and Situational Awareness,"
   DARPA STTR 03ST1-003 Phase I, 2003, $98,915
   (Collaboration with Boston University)

Technical Lead
(Wrote the proposals and was Technical Lead)

1. "Autonomous Intelligent Document Analysis system (AIDA),"
   DoD Army SBIR A01-040 Phase II, 6/30/2003 - 6/30/2005, $730,000

2. "Autonomous Intelligent Document Analyzer (AIDA),"
   DoD Army SBIR A01-040 Phase I, 1/2/2002 - 1/24/2003, $120,000

3. "Real-time Autonomous Video Enhancement system (RAVE),"
   DoD Navy SBIR N00-108 Phase II, 9/27/2001 - 9/27/2003, $749,560

4. "Real-time Autonomous Video Enhancement system (RAVE),"
   DoD Navy SBIR N00-108 Phase I, 10/25/2000 - 4/25/2001, $99,998

5. "Intelligent Surveillance and Intrusion detection for Ships (ISIS),"
   DoD Navy SBIR N02-073 Phase I, 6/6/2002 - 10/30/2002, $69,999