

Abby Stylianou

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Education

Dec 2018	Ph.D. in Computer Science Advisors: Dr. Robert Pless and Dr. Sanmay Das Thesis: <i>Learning about Large Scale Image Search: Lessons from Global Scale Hotel Recognition to Fight Sex Trafficking</i>	Washington University in St. Louis
Dec 2016	M.S. in Computer Science Masters Thesis: <i>Indoor Scene Localization to Fight Sex Trafficking in Hotels</i>	Washington University in St. Louis
May 2012	B.A. in Environmental Studies: Geoscience	Washington University in St. Louis

Appointments and Affiliations

Assistant Professor, Department of Computer Science Beginning August 2019	Saint Louis University Saint Louis, MO
Postdoctoral Research Scientist Jan 2019–present	George Washington University Washington, DC
Visiting Scholar Jan 2019–present	Danforth Plant Science Center Saint Louis, MO
Clare Booth Luce Graduate Fellow Aug 2016–Dec 2018	Washington University in St. Louis Saint Louis, MO
Research Associate July 2012–August 2016	Washington University in St. Louis Saint Louis, MO

Research Interests

My research has focused on building very large datasets of images and their metadata, and the deep learning approaches to digest and understand those datasets for a variety of tasks. These tasks include performing hotel-specific image retrieval in order to locate victims of sex trafficking who have been photographed in hotels, making measurements of the natural environment in time-lapse imagery to understand climate change, and observing how individuals interact with the world around them in outdoor webcam images to support better design of the built environment. I am particularly interested in how motivated communities of non-experts can participate in the collection of these datasets, what artifacts and challenges are introduced by capturing data from such diverse populations, and how computer vision and machine learning solutions to the complex geometric and image retrieval problems that I work on can be made accessible and understandable to non-technical individuals, such as citizen journalists and law enforcement investigators, through software interfaces designed specifically with non-experts in mind.

Awards

- National Center for Women Information Technology Collegiate Award Honorable Mention for ‘TraffickCam: Image Analysis to Combat Human Trafficking’, 2019.

- Turner Dissertation Award recipient for Best Dissertation of 2018, Washington University Department of Computer Science & Engineering.
- Best Paper Award for “SparkleGeometry: Glitter Imaging for 3D Point Tracking” at the Computational Cameras and Displays Workshop, CVPR 2016.
- First place, Graduate Student Research Symposium, Washington University in St. Louis, 2016.
- Best Paper Award for “Finding Jane Doe: A Forensic Application of 2D Image Calibration” at the International Conference on Imaging in Crime Detection and Prevention (ICDP) 2013.

Publications

Refereed Journal Publications

- [1] J. Aaron Hipp, Burgess Amanda Manteiga, Alicia, Abby Stylianou, and Robert Pless. Webcams, crowdsourcing, and enhanced crosswalks: Developing a novel method to analyze active transportation. *Frontiers in Public Health*, published online, 2016.

Book Chapters

- [2] J. Aaron Hipp, Deepti Adlakha, Amy A. Eyler, Rebecca Gernes, Agata Kargol, Abigail Stylianou, and Robert Pless. Learning from outdoor webcams: Surveillance of physical activity across environments. In *Seeing Cities Through Big Data: Research, Methods and Applications in Urban Informatics*, pages 471–490. Springer International Publishing, 2017.

Refereed Conference and Workshop Publications

- [3] Abby Stylianou, Hong Xuan, Maya Shende, Jonathan Brandt, Richard Souvenir, and Robert Pless. Hotels-50k: A global hotel recognition dataset. In *The AAAI Conference on Artificial Intelligence (AAAI)*, January 2019.
- [4] Abby Stylianou, Richard Souvenir, and Robert Pless. Visualizing deep similarity networks. In *IEEE Winter Conference on Applications of Computer Vision (WACV)*, January 2019.
- [5] Abby Stylianou, Richard Souvenir, and Robert Pless. Traffickcam: Crowdsourced and computer vision-based approaches to fighting sex trafficking. *2017 IEEE Applied Imagery Pattern Recognition Workshop (AIPR)*, October 2017.
- [6] Abby Stylianou and Robert Pless. Sparklegeometry: Glitter imaging for 3d point tracking. In *IEEE Workshop on Computational Cameras and Displays*, 2016.
- [7] J. Aaron Hipp, Alicia Manteiga, Amanda Burgess, Abby Stylianou, and Robert Pless. Cameras and crowds in transportation tracking. In *International Conference on Wireless, Connected and Mobile Health Research*, 2015.
- [8] Abby Stylianou, Abigail Norling-Ruggles, Richard Souvenir, and Robert Pless. Indexing open imagery to create tools to fight sex trafficking. In *2015 IEEE Applied Imagery Pattern Recognition Workshop (AIPR)*, October 2015.
- [9] Abby Stylianou, Austin Abrams, and Robert Pless. Characterizing feature matching performance over long time periods. In *IEEE Winter Conference on Applications of Computer Vision (WACV)*, January 2015.
- [10] Joseph O’Sullivan, Abby Stylianou, and Robert Pless. Democratizing the visualization of 500 million webcam images. In *2014 IEEE Applied Imagery Pattern Recognition Workshop (AIPR)*, October 2014.
- [11] Abby Stylianou, Joseph O’Sullivan, Austin Abrams, and Robert Pless. Images don’t forget: Online photogrammetry to find lost graves. In *2014 IEEE Applied Imagery Pattern Recognition Workshop (AIPR)*, October 2014.

- [12] J. Aaron Hipp, Deepti Adlakha, Amy A. Eyler, Rebecca Gernes, Agata Kargol, Abigail Stylianou, and Robert Pless. Learning from outdoor webcams: Surveillance of physical activity across environments. In *NSF Workshop on Big Data and Urban Informatics*, 2014.

Abstracts

- [13] Zongyang Li, Abby Stylianou, and Robert Pless. Learning to correct for bad camera settings in large scale plant monitoring. In *IEEE Workshop on Computer Vision Problems in Plant Phenotyping (CVPR Workshop)*, June 2019.
- [14] Zeyu Zhang, Hong Xuan, Xiaotong Liu, Abby Stylianou, and Robert Pless. Visualizing data driven phenotypes. In *IEEE Workshop on Computer Vision Problems in Plant Phenotyping (CVPR Workshop)*, June 2019.

Datasets

- [15] Abby Stylianou, Hong Xuan, Maya Shende, Jonathan Brandt, Richard Souvenir, and Robert Pless. Hotels-50k: A global hotel recognition dataset. In *The AAAI Conference on Artificial Intelligence (AAAI)*, January 2019.

Teaching & Mentoring

- Guest Lecture, *Introduction to Computer Vision (CSCI 4527)*, SP2018, George Washington University
- Mentored Teaching Experience, *Computer Vision (CSE 559A)*, FL2017, Washington University in St. Louis
Prepared and taught weekly recitation section and held weekly office hours
- Instructor, *Computer Science Institute for Women*, SU2015, Donald Danforth Plant Science Center
Prepared and taught several sessions during a weeklong computer science camp for middle school girls

Funding

Grants (as Senior Personnel or Contributor)

1. *An Object-Centric Approach for Image Analysis to Combat Human Trafficking*
PI: Robert Pless
Sponsor: National Institute of Justice
Amount Funded: \$1,005,852
Duration: 2019–2021

Talks

- “Understanding Image Similarity in Deep Networks with Applications in Combating Human Trafficking”, Jan. 2019, Danforth Plant Science Center, Saint Louis, MO
- “Hotels-50K: A Global Hotel Recognition Dataset”, Jan. 2019, The Thirty-Third AAAI Conference on Artificial Intelligence, Honolulu, HI
- “Visualizing Deep Similarity Networks”, Jan. 2019, IEEE WACV, Waikoloa Village, HI
- “Traffickcam: Crowdsourced and Computer Vision Based Approaches to Fighting Sex Trafficking”, Oct. 2017, Applied Imagery Pattern Recognition Workshop (AIPR), Washington, DC
- “Sparklegeometry: Glitter Imaging for 3D Point Tracking”, July 2016, CVPR Computational Cameras and Displays Workshop, Las Vegas, NV
- “Introducing Traffickcam”, June 2016, Maritz Holdings Inc., Saint Louis, MO

- “Indexing Open Imagery to Create Tools to Fight Sex Trafficking”, Oct. 2015, Applied Imagery Pattern Recognition Workshop (AIPR), Washington, DC
- “Images Don’t Forget: Online Photogrammetry to Find Lost Graves”, Oct. 2015, Applied Imagery Pattern Recognition Workshop (AIPR), Washington, DC
- “Characterizing feature matching performance over long time periods”, Jan. 2015, IEEE WACV, Waikoloa Village, HI
- “Finding Jane Doe: A forensic application of 2d image calibration”, Dec. 2013, International Conference on Imaging in Crime Detection and Prevention (ICDP), London, England

Popular Press

- “AI has helped rescue children trafficked for sexual exploitation”, New Scientist, Feb. 2019, <https://www.newscientist.com/article/2193727-ai-has-helped-rescue-children-trafficked-for-sexual-exploitation/>
- “Scientists use AI to help children sold for sex in hotels”, Thomson Reuters Foundation News, <http://news.trust.org/item/20190211114045-fa4qk/>
- “How AI can help halt human sex trafficking by identifying victims’ hotel rooms from pics”, The Register, Jan. 2019, https://www.theregister.co.uk/2019/02/05/ai_human_trafficking/
- “Your hotel room photos could help catch sex traffickers”, CNN, Feb. 2017, <https://www.cnn.com/2017/02/09/tech/traffickcam-sex-trafficking/index.html>
- “An incredibly simple way your phone may help save sex trafficked children”, Washington Post, July 2016, https://www.washingtonpost.com/news/inspired-life/wp/2016/07/01/how-simply-snapping-a-photo-of-your-hotel-room-could-save-trafficked-children/?noredirect=on&utm_term=.d1144d47af76
- “How you can help victims of sex trafficking while traveling”, The Daily Dot, June 2016, <https://www.dailymail.com/debug/traffickcam-sex-trafficking-st-louis-app/>
- “A new app created in St. Louis aims to track down pimps and victims of sex trafficking”, Saint Louis Post Dispatch, June 2016, https://www.stltoday.com/news/local/crime-and-courts/a-new-app-created-in-st-louis-aims-to-track/article_984efb3b-8ee1-5f98-94d7-96afeefa5af0.html
- “You can help stop human trafficking with the TraffickCam app”, TechCrunch, June 2016, <https://techcrunch.com/2016/06/25/traffickcam/>
- “Who was she? New technology brings hope to identifying headless girl killed 30 years ago”, Fox News, June 2013, <https://www.foxnews.com/us/who-was-she-new-technology-brings-hope-to-identifying-headless-girl-killed-30-years-ago>
- “Slain girl’s remains found as part of 30-year-old St. Louis murder investigation”, Saint Louis Post Dispatch, June 2013, https://www.stltoday.com/news/local/crime-and-courts/slain-girl-s-remains-found-as-part-of--year/article_266e23ef-c09e-5d36-bdd4-db7090e4f461.html
- “Experts join hunt for slain child’s grave in Berkeley cemetery”, Saint Louis Post Dispatch, Mar. 2013, https://www.stltoday.com/news/local/crime-and-courts/experts-join-hunt-for-slain-child-s-grave-in-berkeley/article_a3208928-56ec-551e-b654-447a5b350ba1.html