Curriculum Vitae

Name

Jonathan Daniel Ventura

Educational Preparation

Postdoc in Computer Science, Graz University of Technology October 2012 – June 2014

Ph.D. in Computer Science, University of California, Santa Barbara March 2012

M.S. in Computer Science, University of California, Santa Barbara November 2010

B.S. in Computer Science, University of California, Santa Barbara June 2005

Employment History

Assistant Professor, Department of Computer Science & Software Engineering
California Polytechnic State University, San Luis Obispo September 2018 – present

Assistant Professor, Department of Computer Science
University of Colorado Colorado Springs August 2014 – June 2018

Awards and Honors

Best Paper Award (with A. Sharma), *IEEE International Conference on Artificial Intelligence and Virtual Reality*, San Diego, CA, December 2019.

UCCS Engineering and Applied Science Researcher of the Year, 2016.

Best Paper Award (with C. Arth, C. Pirchheim, D. Schmalstieg, and V. Lepetit), *IEEE International Symposium on Mixed and Augmented Reality (ISMAR '15)*, Fukuoka, Japan, October 2015.

Best Paper Award (with S. Gauglitz, C. Sweeney, M. Turk, and T. Höllerer), *IEEE International Symposium on Mixed and Augmented Reality (ISMAR '12)*, Atlanta, GA, November 2012.

Semi-finalist, ACM Student Research Competition, 2008.

Adobe Best Poster Award, UCSB Graduate Student Workshop, 2008.

NSF Integrative Graduate Education and Research Traineeship (IGERT), 2006-2008.

Professional Memberships and Registrations

Member, Institute for Electrical and Electronics Engineers (IEEE) Computer Society.

Member, Association for Computing Machinery (ACM).

Community and Professional Service Contributions

Program chair

IEEE Artificial Intelligence & Virtual Reality (AIVR) Conference, 2019.

ACM Multimedia Systems Conference: Special Session on Augmented Reality, 2015-16.

IEEE AVSS Workshop on Surveillance for Location-aware Data Protection, 2016.

Program committee

ACM Symposium on Virtual Reality Software & Technology, 2015-17.

IEEE Virtual Reality, 2015-16.

IEEE International Symposium on Mixed & Augmented Reality, 2012-14, 2018.

IEEE ISMAR Workshop on Tracking Methods and Applications, 2012-14.

Reviewer

AAAI Conference on Artificial Intelligence

Asian Conference on Computer Vision

Elsevier Computers & Graphics

Elsevier Computer Vision and Image Understanding

Elsevier Image and Vision Computing

Elsevier International Journal of Human-Computer Studies

Elsevier Multimedia Systems Journal

Eurographics Conference

European Conference on Computer Vision

International Conference on Computer Vision

IEEE Computer Vision and Pattern Recognition

IEEE International Conference on 3D Vision

IEEE International Symposium on Mixed & Augmented Reality

IEEE International Symposium on Wearable Computers

IEEE Symposium on 3D User Interfaces

IEEE Transactions on Visualization and Computer Graphics

IEEE Virtual Reality

Laval Virtual Reality International Conference

Springer Virtual Reality

Springer Journal of Mathematical Imaging

Publications

In author lists, my name is in bold font, an asterisk indicates a graduate student researcher and two asterisks indicates an undergraduate student researcher.

Books and Book Chapters

1. **Jonathan Ventura** and Tobias Höllerer. Urban visual modeling and tracking. In *Fundamentals of Wearable Computers and Augmented Reality*, chapter 8, pages 174–194. CRC Press, Boca Raton, 2nd edition, 2015.

Peer-reviewed Journal Articles

1. Geoffrey A Fricker, **Jonathan D Ventura**, Jeffrey A Wolf, Malcolm P North, Frank W Davis, and Janet Franklin. A convolutional neural network classifier identifies tree species in mixed-conifer forest from hyperspectral imagery. *Remote Sensing*, 11(19):2326, 2019.

2. **Jonathan Ventura** and Tobias Höllerer. Structure and motion in urban environments using upright panoramas. *Virtual Reality*, 17(2), 2013.

Peer-reviewed Conference Proceedings

1. Alisha Sharma** and **Jonathan Ventura**. Unsupervised learning of depth and ego-motion from cylindrical panoramic video. In *IEEE Conference on Artificial Intelligence and Virtual Reality (AIVR'19)*, 2019.

2. Lewis Baker*, Stefanie Zollmann, and **Jonathan Ventura**. Spherical structure-from-motion for casual capture of stereo panoramas. In *IEEE Virtual Reality (VR) Posters*, Osaka, Japan, 2019.

3. Yousef Alsahafi*, Daniel Lemmond**, **Jonathan Ventura**, and Terrance E. Boult. CarVideos: A novel dataset for fine-grained car classification in videos. In *International Conference on Information Technology: New Generations*, 2019.

4. Diptodip Deb** and **Jonathan Ventura**. An aggregated multicolumn dilated convolution network for perspective-free counting. In *CVPR Workshop on Visual Understanding of Humans in Crowd Scene*, Salt Lake City, UT, 2018.

5. Tobias Langlotz, Elias Tappeiner*, Stefanie Zollmann, **Jonathan Ventura**, and Holger Regenbrecht. Urban pointing: Browsing situated media using accurate pointing interfaces. In *ACM CHI Conference Extended Abstracts on Human Factors in Computing Systems*, Montreal, Canada, 2018.

6. Patrick Skinner*, **Jonathan Ventura**, and Stefanie Zollmann. POSTER: indirect augmented reality browser for GIS data. In *Adjunct Proceedings of the IEEE International Symposium for Mixed and Augmented Reality 2018*, Munich, Germany, 2018.

7. Chloe Bradley*, Terrance E. Boult, and **Jonathan Ventura**. Cross-modal facial attribute recognition with geometric features. *International Workshop on Heterogeneous Face Recognition (HFR) co-located with 12th IEEE Conference on Automatic Face & Gesture Recognition*, 2017.

8. Derek Prijatelj**, **Jonathan Ventura**, and Jugal Kalita. Neural networks for semantic textual similarity. 2017.

9. **Jonathan Ventura**, Steve Cruz**, and Terrance E. Boult. Improving teaching and learning through video summaries of student engagement. In *Workshop on Computational Models for Learning Systems and Educational Assessment (CMLA 2016)*, Las Vegas, NV, 2016.

10. Stefanie Zollmann, Christian Poglitsch*, and **Jonathan Ventura**. VISGIS: Dynamic situated visualization for geographic information systems. *Image and Vision Computing New Zealand*, 2016.

11. **Jonathan Ventura**. Structure from motion on a sphere. In *European Conference on Computer Vision (ECCV)*, Amsterdam, the Netherlands, 2016.

12. **Jonathan Ventura**, Clemens Arth, and Vincent Lepetit. An efficient minimal solution for multi-camera motion. In *International Conference on Computer Vision (ICCV)*, Santiago, Chile, 2015.

13. Clemens Arth, Christian Pirchheim*, **Jonathan Ventura**, Dieter Schmalstieg, and Vincent Lepetit. Instant outdoor localization and SLAM initialization from 2.5D maps. In *International Symposium on Mixed and Augmented Reality (ISMAR)*, Fukuoka, Japan, 2015.

14. Christian Poglitsch*, Clemens Arth, Dieter Schmalstieg, and **Jonathan Ventura**. [POSTER] A particle filter approach to outdoor localization using image-based rendering. In *International Symposium on Mixed and Augmented Reality (ISMAR)*, 2015.

15. Lukas Gruber*, **Jonathan Ventura**, and Dieter Schmalstieg. Image-space illumination for augmented reality in dynamic environments. In *IEEE Virtual Reality*, Arles, France, 2015.

16. **Jonathan Ventura**, Clemens Arth, Gerhard Reitmayr, and Dieter Schmalstieg. A minimal solution to the generalized pose-and-scale problem. In *Computer Vision and Pattern Recognition (CVPR)*, Columbus, OH, USA, 2014.

17. **Jonathan Ventura**, Clemens Arth, Gerhard Reitmayr, and Dieter Schmalstieg. Global localization from monocular SLAM on a mobile phone. In *IEEE Virtual Reality*, Minneapolis, MN, USA, 2014.

18. **Jonathan Ventura**, Clemens Arth, and Vincent Lepetit. Approximated relative pose solvers for efficient camera motion estimation. In *ECCV 2014 Workshop on Computer Vision in Vehicle Technology*, 2014.

19. Steffen Gauglitz, Chris Sweeney, **Jonathan Ventura**, Matthew Turk, and Tobias Höllerer. Model estimation and selection towards unconstrained real-time tracking and mapping. *IEEE Transactions on Visualization and Computer Graphics*, 2013.

20. Clemens Arth, **Jonathan Ventura**, and Dieter Schmalstieg. Geospatial management and utilization of large-scale urban visual reconstructions. In *Computing for Geospatial Research & Application (COM.Geo), 4th International Conference on*, San Jose, CA, USA, 2013.

21. Steffen Gauglitz, Chris Sweeney, **Jonathan Ventura**, Matthew Turk, and Tobias Hollerer. Live tracking and mapping from both general and rotation-only camera motion. In *Mixed and Augmented Reality (ISMAR), 2012 IEEE International Symposium on*, Atlanta, GA, USA, 2012.

22. **Jonathan Ventura** and Tobias Hollerer. Wide-area scene mapping for mobile visual tracking. In *Mixed and Augmented Reality (ISMAR), 2012 IEEE International Symposium on*, Atlanta, GA, USA, 2012.

23. **Jonathan Ventura** and Tobias Hollerer. Fast and scalable keypoint recognition and image retrieval using binary codes. In *Applications of Computer Vision (WACV), 2011 IEEE Workshop on*, Kona, HI, USA, 2011.

24. **Jonathan Ventura** and Tobias Hollerer. Outdoor mobile localization from panoramic imagery. In *Mixed and Augmented Reality (ISMAR), 2011 10th IEEE International Symposium on*, Basel, Switzerland, 2011.

25. Lukas Gruber, Steffen Gauglitz, **Jonathan Ventura**, Stefanie Zollmann, Manuel Huber, Michael Schlegel, Gudrun Klinker, Dieter Schmalstieg, and Tobias Hollerer. The city of sights: Design, construction, and measurement of an augmented reality stage set. In *Mixed and Augmented Reality (ISMAR), 2010 9th IEEE International Symposium on*, Seoul, South Korea, 2010.

26. **Jonathan Ventura** and Tobias Höllerer. Real-time planar world modeling for augmented reality. In *IEEE ISMAR Workshop on Augmented Reality Super Models*, Seoul, South Korea, 2010.

27. **Jonathan Ventura** and Tobias Hollerer. Online environment model estimation for augmented reality. In *Mixed and Augmented Reality, 2009. ISMAR 2009. 8th IEEE International Symposium on*, Orlando, FL, USA, 2009.

28. **Jonathan Ventura**, Stephen DiVerdi, and Tobias Höllerer. A sketch-based interface for photo pop-up. In *Proceedings of the 6th Eurographics Symposium on Sketch-Based Interfaces and Modeling*, New Orleans, LA, USA, 2009.

29. **Jonathan Ventura**, Marcus Jang, Tyler Crain, Tobias Höllerer, and Doug Bowman. Evaluating the effects of tracker reliability and field of view on a target following task in augmented reality. In *Proceedings of the 16th ACM Symposium on Virtual Reality Software and Technology*, Kyoto, Japan, 2009.

30. Cha Lee, **Jonathan Ventura**, Chris Coffin, Sehwan Kim, and Tobias Höllerer. “Anywhere access” with annotated environment maps. In *IEEE ISMAR Workshop on AR 2.0: Social Augmented Reality*, Orlando, FL, USA, 2009.

31. Lukas Gruber, **Jonathan Ventura**, Steffen Gauglitz, Stefanie Zollmann, Dieter Schmalstieg, and Tobias Höllerer. Sightlining: Designing an augmented reality stage set. In *WARM 2010: Winter Augmented Reality Meeting*, Graz, Austria, 2009.

32. Jason Wither, Chris Coffin, **Jonathan Ventura**, and Tobias Hollerer. Fast annotation and modeling with a single-point laser range finder. In *Proceedings of the 7th IEEE/ACM International Symposium on Mixed and Augmented Reality*, Cambridge, UK, 2008.

33. **Jonathan Ventura** and Tobias Höllerer. Depth compositing for augmented reality. In *ACM SIGGRAPH 2008 posters*, Los Angeles, CA, USA, 2008.

34. Alex Villacorta, Karl Grossner, **Jonathan Ventura**, Anne-Marie Hansen, Emily Moxley, Joriz de Guzman, and Matt Peterson. Spheres of influence. ACM SIGGRAPH Art Gallery: Global Eyes, 2007.

Non-peer-reviewed Publications

1. Marc Moreno López* and **Jonathan Ventura**. Dilated convolutions for brain tumor segmentation in MRI scans. *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI) Brain Lesion (BrainLes) workshop*, 2017.

2. Steffen Gauglitz, Christopher Michael Sweeney, **Jonathan Ventura**, Matthew Alan Turk, and Hollerer Tobias. Environment mapping with automatic motion model selection, November 2016. US Patent US9495761 B2.

3. Christian Pirchheim*, **Jonathan Ventura**, **Dieter Schmalstieg**, Clemens Arth, and Vincent Lepetit. Augmented reality lighting with dynamic geometry, June 2015. US Patent US 20150262412 A1.

4. Lukas Gruber, Dieter Schmalstieg, and **Jonathan Ventura**. Zero-baseline 3d map initialization, January 2015. US Patent US 20150371440 A1.

5. Stephen J. Diverdi and **Jonathan Ventura**. Generating a depth map based on a single image, May 23 2013. US Patent 20,130,127,823.

Funded Grants

1. **Jonathan Ventura**, PI, Hunter Glanz, Co-PI, Dennis L. Sun, Co-PI, Foaad Khosmood, Co-PI, and Alexander Dekhtyar, Co-PI. “HDR DSC: Collaborative Research: Central Coast Data Science Partnership: Training a New Generation of Data Scientists.” 1/1/2020 – 12/31/2022. National Science Foundation, $243,638.00.

2. Bruce E. DeBruhl, PI, Alexander Dekhtyar, Co-PI, Aaron Keen, Co-PI, Zoë Wood, Co-PI, and **Jonathan Ventura**, Co-PI. “CUE Ethics: Collaborative Research: CS4All: An Inclusive and In-Depth Computing Curriculum for Non-Majors.” 10/1/2019 – 9/30/2022. National Science Foundation, $386,374.00.

3. **Jonathan Ventura**, PI. "Imaging Live Cells with Super-Resolution Microscopy." 9/13/2018 – 6/30/2021. University of Colorado Colorado Springs via National Institute of General Medical Sciences (Primary) and National Institute of Biomedical Imaging and Bioengineering, $62,793.00.
4. Private gift in support of a four-GPU server to support undergraduate & graduate student research. 1/13/2019. $25,000.00.
5. Guy Hagen, PI **Jonathan Ventura**, Co-PI and Kathrin Spendier, Co-PI. "Imaging Live Cells with Super-Resolution Microscopy." 7/1/2018 – 6/30/2021. National Institute of General Medical Sciences (Primary) and National Institute of Biomedical Imaging and Bioengineering. $432,000.00.
6. Jugal Kalita, PI and **Jonathan Ventura**, Co-PI. "REU Site: Machine Learning in Natural Language Processing and Computer Vision." 6/1/2017 – 5/31/2020. National Science Foundation, $386,374.00.
7. **Jonathan Ventura**, PI. "Deep Learning for Brain Tumor Segmentation." 5/1/2017 – 4/31/2018. UCCS Center of the BioFrontiers Institute, $24,891.00.
8. **Jonathan Ventura**, PI and Terrance E. Boult, Co-PI. "The Graduate Certificate in Innovation at University of Colorado Colorado Springs." 8/1/2015 – 12/31/2017. VentureWell, $35,345.00.
9. **Jonathan Ventura**, PI. "High-speed Visual-Inertial Sensor Fusion." 7/1/2015 – 6/30/2016. UCCS Collaborative Research and Creative Works, $7,473.00.
10. **Jonathan Ventura**, PI. "CRII: RI: High-Speed Vision-Based Motion Estimation." 5/1/2015 – 4/30/2018. National Science Foundation, $174,802.00.
11. Terrance E. Boult, PI and **Jonathan Ventura**, Co-PI. "IARPA Janus Face Recognition." 10/1/2014 – 8/1/2018. Sub-contract to University of Maryland. $569,318.00.

Graduate Students

1. Ryan Nett, Computer Science B.S./M.S. program, expected graduation Spring 2020. Tentative thesis title: "Dataset and Evaluation of Self-Supervised Learning for Panoramic Depth Estimation."

Courses Taught

Spring 2019

CSC 348: Discrete Structures

Winter 2019

CSC 566: Special Topics in Knowledge Discovery from Data: Representation Learning

Fall 2018

CSC 478: Special Topics in Computer Graphics: Computer Vision Systems

Other Significant Student Advising and Related Projects

Senior projects:

1. John Luu, Computer Science, Spring 2019. Project title: “Evaluating the Performance of 3D Face Recognition Inferred from 2D Faces Against Standard 2D Face Recognition.”
2. Gustave Rousselet, Computer Science, Spring 2019. Project title: “Classification of post-wildfire aerial imagery using convolutional neural networks.”
3. Dillon Pinto, Computer Science, Fall 2019. Tentative project title: “Automatic classification of burn severity in post-fire aerial imagery using a convolutional neural network.”

Significant Service

Community

Reviewer for IEEE Computer Vision and Pattern Recognition and the International Conference on Computer Vision, the top academic conferences in the computer vision field.

Department

Committee memberships:

- SysAdmin committee: Spring 2019 – present.
- Graduate committee: Fall 2019 – present.
- Data science curriculum committee: Fall 2019 – present.