Brandon Michael Smith

Postdoctoral Research Associate

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Skills

Primary areas: computer vision, computational imaging, image processing
Languages and libraries: C/C++, MATLAB, Java, Objective-C, OpenCV, OpenGL

Education

PhD in Computer Sciences, *University of Wisconsin–Madison* — May 2014

Dissertation title: Exemplar-based face image parsing with landmark- and segment-based representations

Committee: Li Zhang (advisor), Charles Dyer, Michael Gleicher, Vikas Singh, and Jonathan Brandt

NSF Graduate Research Fellow

Master of Science in Computer Sciences, *University of Wisconsin–Madison* — May 2009

Bachelor of Science in Computer Engineering, *University of Nebraska–Lincoln* — May 2007
Bachelor of Science in Electrical Engineering, *University of Nebraska–Lincoln* — May 2007

Honors Program graduate

Superior Scholar (recognized at Honors Convocation each year of enrollment)

Employment

University of Wisconsin–Madison Department of Computer Sciences
Postdoctoral Research Associate (supervised by Charles Dyer, Mohit Gupta) — 2014 – present
Graduate Research Assistant (supervised by Li Zhang) — 2008 – 2014

Lead author of 10+ papers in top publication venues, e.g., CVPR, SIGGRAPH, ICCV, ECCV

Collaborated with computer vision researchers, mentored younger students

Co-authored several successful grant proposals

KagenAir LLC, Appleton, WI
Technical Consultant — 2015 – present

Developed state-of-the-art computer vision functionality for the Sensitometer mobile application (available on iTunes), which measures pupillary light reflex

Effort led by former U.S. Representative Steve Kagen, M.D.

Adobe Systems Incorporated, San Jose, CA
Computer Vision Research Intern — Summer 2013

Worked in the Imagination Lab (now the Creative Intelligence Lab) on facial landmark localization. US Patent 9129152

Adobe Systems Incorporated, San Jose, CA
Computer Graphics and Computer Vision Research Intern Summer 2009

Worked in the Advanced Technology Lab (now the Creative Intelligence Lab) on image-based modeling and 3D reconstruction. US Patent Application 12852349

The Boeing Company, St. Louis, MO
Intern Summer 2006

Worked in the Electronic Systems Integration Laboratory of the Boeing Integrated Defense Systems division (now Boeing Defense, Space & Security) to develop components on test bench motherboards for aircraft electronics testing

Developed modules using Very-High-Speed Integrated Circuit Hardware Description Language (VHDL) and C

Sandia National Laboratory, Livermore, CA
Intern Summer 2005

Worked in the Sandia Institute for Modeling and Simulation to develop software modules for the U.S. Borders Application, which simulates traffic flow at key points on the U.S. borders

Studied radiation detection technology and created a Java-based software model of radiation-detecting portals

National Institute of Standards and Technology (NIST), Boulder, CO
Summer Undergraduate Research Fellow Summer 2004

Worked in the Scientific Applications and Visualization Group to develop software tools in C for manipulating 3D geometric data

Studied 3D immersive scientific visualization

Teaching and Lecturing Experience

PhD Minor in Teaching as Research, *University of Wisconsin–Madison*

The Delta Program in Research, Teaching and Learning

Graduate Teaching Assistant, *University of Wisconsin–Madison* Fall 2007

CS 367: Data Structures and Algorithms, Department of Computer Sciences

Guest Lecturer (two lectures), *University of Wisconsin–Madison* Fall 2012

CS 766: Computer Vision, Department of Computer Sciences

Guest Lecturer (two lectures), *University of Wisconsin–Madison* Spring 2011

CS 534: Computational Photography, Department of Computer Sciences

Publications

Book Chapters

Li Zhang, **Brandon M. Smith**, Shengqi Zhu. *FaceSimile: A Mobile Application for Face Image Search Based on Interactive Shape Manipulation*. Chapter in Gang Hua, Xian-Sheng Hua, editors, Mobile Cloud Visual Media Computing: From Interaction to Service, pages 147-165. Springer International, 2015.

Refereed Journal Papers

Brandon M. Smith, Pratham Desai, Vishal Agarwal, Mohit Gupta. *CoLux: Multi-Object 3D Micro-Motion Analysis Using Speckle Imaging*, ACM Trans. Graph. (also Proc. SIGGRAPH), July 2017.

Brandon M. Smith, Charles R. Dyer, Madhav V. Chitturi, John D. Lee. *Automatic Driver Head State Estimation in Challenging Naturalistic Driving Videos.* Transportation Research Record: Journal of the Transportation Research Board, 2017, *in press*.

Refereed Conference Papers

Brandon M. Smith, Charles R. Dyer. *Pose-Robust 3D Facial Landmark Estimation from a Single 2D Image*. 27th British Machine Vision Conference (BMVC), York, United Kingdom, September 19 – 22, 2016.

Hyunwoo J. Kim*, **Brandon M. Smith***, Nagesh Adluru, Charles R. Dyer, Sterling C. Johnson, Vikas Singh. *Abundant Inverse Regression using Sufficient Reduction and its Applications*. European Conference on Computer Vision (ECCV), Amsterdam, Netherlands, October 11 – 14, 2016. *Joint first authors

Brandon M. Smith, Li Zhang. *Collaborative Facial Landmark Localization for Transferring Annotations across Datasets.* European Conference on Computer Vision (ECCV), Zürich, Switzerland, September 6–12, 2014.

Brandon M. Smith, Jonathan Brandt, Zhe Lin, Li Zhang. *Nonparametric Context Modeling of Local Appearance for Pose- and Expression-Robust Facial Landmark Localization.* IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), Columbus, Ohio, June 24 – 27, 2014.

Brandon M. Smith, Li Zhang, Jonathan Brandt, Zhe Lin, Jianchao Yang. *Exemplar-Based Face Parsing*. IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), Portland, Oregon, June 25 – 27, 2013.

Brandon M. Smith, Li Zhang. *Joint Face Alignment with Non-Parametric Shape Models*. European Conference on Computer Vision (ECCV), Florence, Italy, October 7 – 13, 2012.

Brandon M. Smith, Shengqi Zhu, Li Zhang. *Face Image Retrieval by Shape Manipulation*. IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), Colorado Springs, Colorado, June 21 – 23, 2011.

Shengqi Zhu, Li Zhang, **Brandon M. Smith**. *Model Evolution: An Incremental Appraoch to Non-Rigid Structure from Motion*. IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), San Francisco, California, June 13 – 18, 2010.

Brandon M. Smith, Li Zhang, Hailin Jin, Aseem Agarwala. *Light Field Video Stabilization*. 12th IEEE International Conference on Computer Vision (ICCV), Kyoto, Japan, September 29 – October 2, 2009.

Brandon M. Smith, Li Zhang, Hailin Jin. *Stereo Matching with Nonparametric Smoothness Priors in Feature Space*. IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), Miami, Florida, June 20 – 26, 2009.

Refereed Abstracts

Brandon M. Smith, Charles R. Dyer, Madhav V. Chitturi, John D. Lee, *Automatic Driver Head State Estimation in Challenging Naturalistic Driving Videos* (poster), Transportation Research Board 96th Annual Meeting, Washington, D.C., January 8 – 12, 2017.

Brandon M. Smith, Charles R. Dyer, Madhav V. Chitturi, John D. Lee, *Video Analytics for Quantifying Driver Distraction and Engagement* (poster), Automated Vehicles Symposium, San Francisco, California, July 11 – 13, 2016.

Brandon M. Smith and Charles R. Dyer, *Efficient and Robust Face Alignment under Significant Head Rotation in the Wild* (poster), IEEE International Conference on Computational Photography (ICCP), Evanston, Illinois, May 13 – 15, 2016.

Brandon M. Smith, Charles R. Dyer, Madhav V. Chitturi, John D. Lee, *Automatic Driver Face State Estimation in Challenging Naturalistic Driving Videos* (talk given by John D. Lee), Transportation Research Board 95th Annual Meeting, Washington, D.C., Lectern Session: User Characteristics Potpourri: Novel Analysis of Naturalistic Data, Legislation and Regulation, and Automated Driving, January 10 – 14, 2016.

Brandon M. Smith, Li Zhang, Hailin Jin. *Stereoscopic 3D Video Stabilization* (demo). IEEE International Conference on Computer Vision (ICCV), Barcelona, Spain, November 6 – 13, 2011.

Shengqi Zhu, **Brandon M. Smith**, Li Zhang. *FaceSimile: A Mobile Application for Face Image Search Based on Interactive Shape Manipulation* (demo). 17th Annual ACM International Conference on Mobile Computing and Networking (MobiCom), Las Vegas, NV, September 19 – 23, 2011.

Technical Reports

Brandon M. Smith, Charles R. Dyer. *Efficient Branching Cascaded Regression for Face Alignment under Significant Head Rotation*. arXiv:1611.01584v2, November 10, 2016.

Patents and Applications

Jonathan Brandt, Zhe Lin, **Brandon M. Smith**. *Exemplar-based Feature Weighting*. United States Patent 9129152. Published Sep 8, 2015.

Hailin Jin, **Brandon M. Smith**. *System and Method for Generating Editable Constraints for Image-based Models*. United States Patent Application 12852349. Published May 16, 2013.

Honors and Awards

Fellow, *National Science Foundation Graduate Research Fellowship Program*	2009 – 2012
Best Poster, *University of Wisconsin–Madison McPherson Eye Research Institute Fall Poster and Gallery Session*	2010
Summer Graduate Research Assistant, *University of Wisconsin–Madison Department of Computer Sciences Summer Research Assistant Award*	Summer 2008
Dean's List (every semester), *University of Nebraska–Lincoln College of Engineering and Technology*	2002 – 2007
Superior Scholar, *University of Nebraska – Lincoln*	2007
Awarded to graduating seniors who were recognized at Honors Convocation each year of their enrollment.	
George W. Beadle Scholarship, *University of Nebraska–Lincoln*	2002 – 2007

Honors Program Textbook Scholarship, *University of Nebraska – Lincoln* 2002 – 2006

Electrical Engineering Faculty Scholarship, *University of Nebraska–Lincoln* 2006 – 2007

Henson Professor of Engineering, Communication, and Information Sciences 2003 – 2004
Fund Scholarship, *University of Nebraska–Lincoln Dept. of Comp. Sci. & Engr.*

Chancellor's Award Scholarship, *University of Nebraska–Lincoln* 2003 – 2004

W.H Sawyer Scholarship for Engineers, *University of Nebraska–Lincoln* 2002 – 2003

Holling Memorial Fund Scholarship, *University of Nebraska–Lincoln* 2002 – 2003

Directors Club Fund Scholarship, *University of Nebraska–Lincoln Music Dept.* 2002 – 2003

Volunteer and Leadership Positions

Program Committee, *International Joint Conference on Artificial Intelligence*
    Member 2016

Student Chapter of the Association for Computing Machinery,
University of Wisconsin–Madison
    Treasurer 2010 – 2011

Computer Vision Reading Group, *University of Wisconsin-Madison*
    Organizer Spring 2011, Spring 2017

Computer Sciences Department Lobby Renovation Committee,
University of Wisconsin–Madison
    Graduate Student Representative 2011 – 2012

Student Chapter of the Association for Computing Machinery,
University of Nebraska–Lincoln
    Chairperson Spring 2007
    Secretary 2005 – 2006

Academic Appeals Committee,
University of Nebraska–Lincoln Department of Computer Science and Engineering
    Undergraduate Representative 2005 – 2006

Referee for Conference Proceedings

    IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
    IEEE International Conference on Computer Vision (ICCV)
    European Conference on Computer Vision (ECCV)
    Automatic Face and Gesture Recognition (FG)
    International Joint Conference on Artificial Intelligence (IJCAI)
    International Conference on 3D Vision (3DV)
    3D Imaging, Modeling, Processing, Visualization and Transmission (3DIMPVT)

Referee for Journal Articles

    International Journal of Computer Vision (IJCV)
    Image and Vision Computing
    IEEE Transactions on Intelligent Transportation Systems
    SIAM Journal on Imaging Sciences (SIIMS)