Kevin Smith

General Information

Born 1975.12.30 in Chicago
Nationality: USA
Swiss Resident (C-Permit)

Research Interests

Bioimage informatics, big data, HCS, machine learning, computer vision

Address

KTH Stockholm
School of Computer Science and Communication
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100 44 Stockholm, Sweden
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Languages

English	Mother tongue
German	Basic
French	Basic

Academic Positions

2015 – present	**Assistant Professor** School of Computer Science and Communications Science for Life Laboratory KTH Royal Institute of Technology, Stockholm, Sweden
2014 – 2015	**Senior Research Associate** Biozentrum University of Basel, Basel, Switzerland
2011 – 2014	**Postdoctoral Researcher** Scientific Center for Optical and Electron Microscopy ETH Zurich, Zurich, Switzerland
2007 – 2011	**Postdoctoral Researcher** Computer Vision Lab, School of Computer and Communication Sciences EPFL, Lausanne, Switzerland
2002 – 2007	**Researcher** IDIAP Research Institute EPFL, Lausanne, Switzerland

Academic Degrees

2002 – 2007	EPFL, Lausanne, Switzerland **Dr. sc.**, Ph.D. in Computer Science Thesis title: Bayesian Methods for Visual Multi-Object Tracking with Applications to Human Activity Recognition Referees: Dr. Daniel Gatica-Perez, Prof. Hervé Bourlard, Prof. James Ferryman, Dr. Patrick Pérez
1999 – 2002	University of Illinois, Urbana-Champaign, Illinois, USA **M.Sc.**, Master of Science in Electrical and Computer Engineering Thesis title: Real-time 3D hand tracking in a virtual environment Supervisor: Prof. Thomas Huang
1994 – 1998	University of Illinois, Urbana-Champaign, Illinois, USA **B.Sc.**, Bachelor of Science in Mechanical Engineering

Awards

2011	Outstanding reviewer CVPR
2010	Placed fourth out of 125 teams ($10,000 prize) in the Janelia Farm DIADEM Challenge (Digital Reconstruction of Axonal and Dendritic Morphology) – "A competition to develop computer algorithms that successfully chart a neuron's many twists and branches."
2010	Outstanding reviewer CVPR
2009	Outstanding reviewer ICCV
2007	Best doctoral candidate in the School of Computer and Communication Sciences, EPFL
1998	University of Illinois at Urbana-Champaign dean's list.
1997 – 1998	Illinois general assembly legislative scholarship (Beverly Fawell). Full tuition at the University of Illinois at Urbana-Champaign.

Grants

under review	*Characterization of the niche responsible for acute lymphoblastic leukemia relapse through quantitative image analysis* Swedish Research Council Principle Investigator: Kevin Smith
2009 – 2012	*Understanding Brain Morphogenesis: Computer Vision Morphological Feature Extraction and a Machine Learning Approach to Study the Molecular and Environmental Factors Regulating Neuronal Development* Swiss National Science Foundation (SNF) Sinergia Principle Investigator: Olivier Pertz (I co-authored as a Postdoc)
2009	*Venture Kick* Swiss start-up competition award Recipient: Kevin Smith

I was substantially involved in writing the proposals for the following projects which funded my postdoctoral work at EPFL.

2009 – 2014	*Modeling Brain Circuitry using Scales Ranging from Micrometer to Nanometer* European Research Council (ERC) Advanced Grant
2008 – 2009	*Fine and Robust Segmentation of Adult-born Neuron Development in 4-D Two-Photon Microscopy* SystemsX.ch Interdisciplinary Pilot Project, Swiss National Science Foundation (SNF)

Supervision

Ph.D. students

2013 – 2014	Filippo Piccinini (Ph.D.) co-supervised with Alessandro Bevilacqua Graduated 2013 from University of Bologna. Postdoc at University of Bologna.
2007 – 2012	Aurélien Lucchi (Ph.D.) co-supervised with Pascal Fua Graduated 2012 from EPFL. Researcher at Swisscom.
2007 – 2011	Germán González (Ph.D.) co-supervised with Pascal Fua Graduated 2011 from EPFL. Postdoc at Swisscom.

M.Sc. students

2013 – 2014	Róger Bermúdez (M.Sc) co-supervised with Gaston Gonnet Graduated 2014 from ETH Zurich. Ph.D. student at EFPL.
2009 – 2010	Deniz Günaydin (M.Sc.) co-supervised with Pascal Fua Graduated 2010 from EPFL. Developer at Credit Suisse.

Teaching

KTH Royal Institute of Technology, School of Computer Science and Communications

Winter 2015	Applied Programming and Computer Science Course manager

ETH Zurich, Department of Biochemistry

Spring 2012	Image Processing with Matlab for Biologists Co-lecturer
Summer 2012	CIMST Interdisciplinary Summer School on Bio-Medical Imaging Lecturer

EPFL, School of Computer and Communication Sciences

2009 – 2011	Selected Topics in Computer Vision Co-lecturer

University of Illinois at Urbana-Champaign, School of Engineering

2000 – 2002	Senior Design Graduate teaching assistant

Professional Activities

Reviewer

IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI), PLOS ONE, BMC Bioinformatics, International Journal of Computer Vision (IJCV), IEEE Transactions on Image Processing (TIP), IEEE Transactions on Medical Imaging (TMI), IEEE Transactions on Signal Processing (TSP), Computer Vision and Image Understanding (CVIU), Pattern Recognition, ACM Multimedia, Signal Processing, EURASIP Journal on Image and Video Processing (IVP), IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE International Conference on Computer Vision (ICCV), European Conference on Computer Vision (ECCV), British Machine Vision Conference (BMVC), IEEE International Symposium on Biomedical Imaging (ISBI), Medical Image Computing and Computer-Assisted Intervention (MICCAI)

Keynotes, Invited talks, and Tutorials

2015.09	Invited talk. Swiss Image-Based Screening Conference, Basel, Switzerland
2015.04	Invited talk. Science for Life Laboratory, Karolinksa Institute, Stockholm, Sweden
2014.12	Invited talk. University of Innsbruck, Austria
2014.10	Invited talk. Bioimage Informatics, Leuven, Belgium
2014.06	Invited talk. University of Seigen, Germany
2014.04	Invited talk. University of Iceland, Reykjavík, Iceland
2013.01	Invited talk. International Symposium on Biomedical Imaging, San Francisco, USA
2012.03	Tutorial. SyBIT Annual Workshop, Leukerbad, Switzerland
2012.01	Tutorial. Center for Imaging Science and Technology Workshop, Zurich Switzerland

Publications

Published works are listed in reverse chronological order. A current record of citations to my work is available at my Google Scholar profile. As of September 2015, my *h-index* computed by Google Scholar was 15, with 2,240 total citations. Co-authors under my supervision are underlined.

Journal Articles

1. K. Smith, Y. Li, F. Piccinini, G. Csucs, A. Bevilacqua, and P. Horvath. CIDRE: An Illumination Correction Method for Optical Microscopy. *Nature Methods*, 12 (5), 404-406. doi:10.1038/NMETH.3323

2. A. Lucchi, P. Marquez Neila, C. Becker, Y. Li, K. Smith, G. Knott, and P. Fua. Learning Structured Models for Segmentation of 2D and 3D Imagery. *IEEE Transactions on Medical Image Processing (TMI)*, in press.

3. K. Smith, P. Horvath. Active Learning Strategies for Phenotypic Profiling of High-Content Screens. *Journal of Biomolecular Screening*, pre-print available March 2014, doi:10.1177/1087057114527313.

4. R. Achanta, A. Shaji, K. Smith, A. Lucchi, P. Fua, and S. Suesstrunk. SLIC Superpixels Compared to State-Of-The-Art Superpixel Methods. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 34 (11):2274–2281, 2012.

5. K. Smith, A. Lucchi, R. Achanta, G. Knott, and P. Fua. Supervoxel-Based Segmentation of Mitochondria in EM Image Stacks with Learned Shape Features. *IEEE Transactions on Medical Imaging*, 31 (2):474–486, 2011.

6. K. Smith, S. Ba, D. Gatica-Perez, and J. Odobez. Tracking the Visual Focus of Attention for a Varying Number of Wandering People. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 30 (4):1212–1229, 2008.

7. K. Smith, D. Sandin, T. Huang, J. Eliason, G. Baum. Real-Time 3D Hand Tracking in a Virtual Environment *Society of Photo-Optical Instrumentation Engineers/Society for Imaging Science and Technology*, 5006 (1):529–543, 2003.

Refereed Conference Papers

1. G. Gonzalez, L. Fusco, F. Benmansour, P. Fua, O. Pertz, and K. Smith. Automated Quantification of Morphodynamics for High-Throughput Live Cell Time-Lapse Datasets. In *IEEE International Symposium on Biomedical Imaging (ISBI)*, San Francisco, CA, April 2013.

2. F. Piccinini, A. Bevilacqua, K. Smith, and P. Horvath. Vignetting and Photo-Bleaching Correction in Automated Fluorescence Microscopy from an Array of Overlapping Images. In *IEEE International Symposium on Biomedical Imaging (ISBI)*, San Francisco, CA, April 2013.

3. <u>A. Lucchi</u>, Y. Li, K. Smith, and P. Fua. Structured Image Segmentation Using Kernelized Features. In *European Conference on Computer Vision (ECCV)*, Firenze, Italy, October 2012.

4. <u>A. Lucchi</u>, Y. Li, X. Boix, K. Smith, and P. Fua. Are Spatial and Global Constraints Really Necessary for Segmentation? In *IEEE International Conference on Computer Vision (CVPR)*, Barcelona, Spain, November 2011.

5. <u>A. Lucchi</u>, K. Smith, R. Achanta, V. Lepetit, and P. Fua. A Fully Automated Approach to Segmentation of Irregularly Shaped Cellular Stuctures in EM Images. In *Conference on Medical Image Computing and Computer Assisted Intervention (ICMI)*, 463–471, Beijing, China, September 2010.

6. K. Smith, A. Carleton, and V. Lepetit. Fast Ray Features for Learning Irregular Shapes. In *IEEE International Conference on Computer Vision (ICCV)*, pages 397–404, Kyoto, Japan September 2009.

7. K. Smith, A. Carleton, and V. Lepetit. General Constraints for Batch Multiple-Target Tracking Applied to Large-Scale Videomicroscopy. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Anchorage, AK, June 2008.

8. K. Smith, S. Ba, J.M. Odobez, and D. Gatica-Perez. Tracking the Multiple-Person Wandering Visual Focus of Attention. In *International Conference on Multimodal Interfaces (ICMI)*, Banff, Canada, November 2006.

9. K. Smith, P. Quelhas, and D. Gatica-Perez. Detecting Abandoned Luggage Items in a Public Space. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR) PETS Workshop*, New York, NY, June 2006.

10. K. Smith, S. Schreiber, I. Potucek, V. Beran, G. Rigoll, and D. Gatica-Perez. Multi-Person Tracking in Meetings: A Comparative Study. In *Multimodal Interaction and Related Machine Learning Algorithms (MLMI)*, Washington DC, May 2006.

11. M. Al-Hames, K. Smith, *et. al.* Audio-Visual Processing in Meetings: Seven Questions and Current AMI Answers. In *Multimodal Interaction and Related Machine Learning Algorithms (MLMI)*, Washington DC, May 2006.

12. K. Smith, S. Schreiber, I. Potucek, V. Beran, G. Rigoll, and D. Gatica-Perez , 2D Multi-Person Tracking in Meetings: A Comparative Study in AMI Meetings. In *Classification of Events, Activities, and Relationships (CLEAR)*, Southampton, UK, April 2006.

13. K. Smith, D. Gatica-Perez, and J. Odobez. Using Particles to Track Varying Numbers of Interacting Objects. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, San Diego, CA, June 2005.

14. K. Smith, D. Gatica-Perez, and J. Odobez. Evaluating Multi-Object Tracking. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR) EEMCV Workshop*, San Diego CA, June 2005.

15. K. Smith and D. Gatica-Perez, Order Matters: A Distributed Sampling Method for Multiple-Object Tracking. In *Proceedings of the British Machine Vision Conference (BMVC)*, London, September 2004.

Technical Reports and Non-refereed Conference Papers

1. G. Gonzalez, F. Ludovico, O. Pertz, and K. Smith. Automated Quantification of Morphodynamics for High-Throughput Live Cell Imaging Datasets. *EPFL Technical Report*, 166286, 2011.

2. R. Achanta, A. Shaji, K. Smith, A. Lucchi, P. Fua, and S. Susstrunk. SLIC Superpixels. *EPFL Technical Report*, 149300, June 2010.

3. K. Smith, A. Lucchi, R. Achanta, V. Lepetit, and P. Fua. Supervoxel-Based Segmentation of EM Image Stacks with Learned Shape Features. *EPFL Technical Report*, 161954, June 2010.

4. K. Smith. Bayesian Methods for Multi-Object Tracking with Applications to Human Activity Recognition. *Thesis EPFL*, no. 3745, Advisors Herve Bourlard and Daniel Gatica-Perez, February 2007.

5. K. Smith. Reversible-Jump Markov Chain Monte Carlo Multi-Object Tracking Tutorial. *IDIAP Technical Report*, IDIAP-COM-06-07, 2006.

6. D. Gatica-Perez, J.M. Odobez, S. Ba, K. Smith, G. Lathoud. Tracking People in Meetings with Particles. In *The International Workshop on Image Analysis for Multimedia Interactive Services (WIAMIS)*, Montreux, April 2005.