Anton van den Hengel

Position

Director**,** Australian Institute for Machine Learning, www.adelaide.edu.au/aiml/

Professor, School of Computer Science, University of Adelaide, www.cs.adelaide.edu.au

Contact

Ph: +61 8 8313 5309

Fax: +61 8 8313 4366

E-mail: Anton.vandenHengel@adelaide.edu.au

Web Page: www.cs.adelaide.edu.au/~hengel

Blog: antonvandenhengel.wordpress.com

Post: School of Computer Science, University Adelaide, South Australia 5005

Personal Information

Nationality: Australian, Dutch

Date of Birth: 12 July 1970

Place of Birth: Ede, Netherlands

Education

Ph. D. in Computer Science 1995 – 2000

Adelaide University

Robust Estimation of Structure from Motion in the Uncalibrated Case

Masters Degree in Computer Science 1993 – 1994

Adelaide University

Thesis: Enhancing a Direct Method of Determining Shape from Shading.

Bachelor of Laws 1989 - 1993

Adelaide University

Bachelor of Mathematical Science 1988 - 1991

Adelaide University

Major: Computer Science

Awards

Excellence in Research Collaboration Award 2017 from SA Science Excellence Awards for work on “Developing a world leading intelligent medical device in South Australia”.

CVPR 2010 Best Paper Prize for A. Eriksson, A. van den Hengel, *Efficient Computation of Robust Low-Rank Matrix Approximations in the Presence of Missing Data using the L_1 Norm*, IEEE Conference on Computer Vision and Pattern Recognition (CVPR ’10), San Fancisco, USA, June 2010. CVPR is one of the equal 2 best conferences in Computer Vision, and the best paper prize one of the most coveted in the field.

Pearcey Award for Innovation in ICT, 2010. This is awarded to an individual who has "taken a risk and made a difference" within the ICT industry. See http://www.pearcey.org.au/

Innovic Next Big Thing People's Choice Award 2009 for the most exciting innovation, awarded for Videotrace.

Research and Development category of the South Australian iAwards, 2010 for Videotrace. The iAwards are Australia’s premier technology innovation awards program, and are presented by The Australian Information Industry Association.

Book Chapters

A. van den Hengel, A. Dick, H. Detmold, A. Cichowski, C. Madden, and Rhys Hill *Distributed Camera Overlap Estimation -- Enabling Large Scale Surveillance*, Remagnino, Paolo, Monekosso, Dorothy and Jain, Lakhmi, eds. (2011) Intelligent Paradigms in Safety and Security; Studies in Computational Intelligence. Springer.

W. Chojnacki, A. van den Hengel, M. Brooks, *Constrained Generalised Principal Component Analysis,* Advances in Computer Graphics and Computer Vision,

International Conferences VISAPP and GRAPP 2006, Setúbal, Portugal, February 25-28, 2006, Revised Selected Papers.

Selected Refereed Conference Papers

Y. Li, L. Liu, C. Shen, A. van den Hengel. *Mid-level deep pattern mining*. IEEE Conference on Computer Vision and Pattern Recognition (CVPR'15). 2015.

L. Liu, C. Shen, A. van den Hengel. *The treasure beneath convolutional layers: cross convolutional layer pooling for image classification*. IEEE Conference on Computer Vision and Pattern Recognition (CVPR'15). 2015

P. Wang, C. Shen, A. van den Hengel. *Efficient SDP inference for fully-connected CRFs based on low-rank decomposition*. IEEE Conference on Computer Vision and Pattern Recognition (CVPR'15). 2015

S. Paisitkriangkrai, C. Shen, A. van den Hengel. *Learning to rank in person re-identification with metric ensembles*. IEEE Conference on Computer Vision and Pattern Recognition (CVPR'15). 2015

M. Tan, Q. Shi, A. van den Hengel, C. Shen, J. Gao, F. Hu, Z. Zhang. *Learning graph structure for multi-label image classification via clique generation*. IEEE Conference on Computer Vision and Pattern Recognition (CVPR'15). 2015.

B. Li, C. Shen, Y. Dai, A. van den Hengel, M. He. *Depth and surface normal estimation from monocular images using regression on deep features and hierarchical CRFs*. IEEE Conference on Computer Vision and Pattern Recognition (CVPR'15). 2015

G. Lin, C. Shen, Q. Shi, A. van den Hengel, D. Suter. *Fast supervised hashing with decision trees for high-dimensional data*. IEEE Conference on Computer Vision and Pattern Recognition (CVPR'14). 2014.

S. Paisitkriangkrai, C. Shen, A. van den Hengel. *Strengthening the effectiveness of pedestrian detection with spatially pooled features*. European Conference on Computer Vision (ECCV'14). 2014.

L. Liu, C. Shen, L. Wang, A. van den Hengel, C. Wang. *Encoding high dimensional local features by sparse coding based Fisher vectors*. Advances in Neural Information Processing Systems (NIPS'14). 2014.

Fumin Shen, Chunhua Shen, Qinfeng Shi, Anton van den Hengel, Z. Tang, *Inductive Hashing on Manifolds*, IEEE Conference on Computer Vision and Pattern Recognition (CVPR'13), Portland, USA, June 2013

Selected Invited Research Presentations

What new results in Visual Question Answering have to say about Old AI, Keynote, GTCx Melbourne, October, 2016

What Visual Question Answering can tell us about really cognitive computing, IBM Melbourne, September 2016

VQA vs. AI, Keynote, Deep Vision Workshop, CVPR 2016

What Lego can tell us about the interaction between shape and semantics in image-based modelling, Google Mountain View, October 2015

Visual Question Answering, and what it can tell us about the unknown knowns, Apple, Cupertino, California, October 2015

Big Data, and how I learned to stop worrying and love Machine Learning, Plenary at

SAHMRI Scientific Symposium, October 2015

Machine Learning in Medicine, Plenary, The Society of Paediatric Urology of New Zealand and Australia (SPUNZA) Annual Meeting, October 2015

Interactive Image-based Modelling, Keynote: DICTA, Fremantle, Perth, December 2012.

Re-identification in practical large scale surveillance, Keynote: Re-Id workshop (in conjunction with ECCV), Florence, Italy, October 2012.

3D Content Creation, Intel, California, USA, July 2012.

Virtual Graffiti, TTI/Vanguard – Real Time, Paris, July, 2011.

Selected Research Funding

Australian Institute for Machine Learning
2018-2022, Director, $12.1M and counting

ARC Discovery Program, Deep visual understanding: learning to see in an unruly world
2018-2021, Chief Investigator, $423k

Data 2 Decisions CRC
2014-2019, Program Lead Analytics and Decision Support, $92M

ARC Centre of Excellence in Robot Vision
2014-2021, Chief Investigator, $25M

Computational infrastructure for machine learning in computer vision
2013, Chief Investigator, Value: $210k
Funding Source: ARC LIEF Program

Scalable classification for massive datasets: randomized algorithms
2012-2014, Chief Investigator, Value $927k
Funding Source: ARC Linkage Program & Industry

Learning to read 3D
2012-2014, Chief Investigator, Value $330k
Funding Source: ARC Discovery Program

Improving yield through image-based structural analysis of cereals
2011-2013, Chief Investigator, Value $725k
Funding Source: ARC Linkage Program & Industry

Added depth: automated high level image interpretation
2011-2013, Chief Investigator, Value $240k
Funding Source: ARC Discovery Program

Multi-model predictions of ecosystem flux under climate change based on novel genetic and image analysis methods
2011-2013, Chief Investigator, Value $465k
Funding Source: ARC Super Science Fellowships

Microbiology Computer Imaging
2011-2012, Chief Investigator, Value $750k
Funding Source: Industry

Content Based Image Search
2011-2012, Chief Investigator, Value $683k
Funding Source: Defence Capability Technology Demonstrator Program (CTD)

Research

Supervised 10 PhD students to completion with 4 ongoing

Supervision

- *D. Gawley,* Robust maximum likelihood parameter estimation, completed 2004, post-doc in ACVT then Oxford
- *C. Shen,* Visual motion analysis by probabilistic reasoning with graphical models, completed 2005, post-doc at NICTA / ANU, now Professor in ACVT
- *J. Bastian,* A hardware accelerated space carving algorithm, completed 2008, post-doc in ACVT
- *D. Pooley,* Synthesising new video streams from multiple sources, completed 2008, post-doc in ACVT
- *B. Ward,* Interactive 3D modelling, completed 2014, then post-doc in ACVT
- *Yanzhi Chen,* Content-based image retrieval, completed 2014, academic position in China
- *Zygmunt Szpak*, Robust structure from motion, completed 2014, then post-doc in ACVT
- *Zhenhua Wang*, Markov Random Fields with Unknown Heterogeneous Graphs, completed 2014, Academic position in China
- *Fayao Lui*, Large-scale image-based classification, completed 2015 then academic position in China
- *Yao Li,* Mid-level feature learning, completed 2017 then to Amazon
- *Ergnoor Shehu,* Optimisation over Reimannian manifolds, *ongoing*
- *Rui Yao*, Large-scale image-based classification, *ongoing*
- *Lachlan Flemming,* Plant phenomics from image sets, *ongoing*
- *R. Hill,* Image-based modelling, *ongoing*

Supervised over 40 Honours and Masters theses to completion

Supervising over 25 postdocs, with 5 completed

- *Darren Gawley*, 2004 – 2007, went on to a post-doc at Oxford
- *Thorsten Thormaehlen,* 2005 – 2007, went on to found a Vision / Graphics group at Max-Planck-Institut für Informatik, Saarbrücken, Germany
- *Emanuel Zelniker,* 2006 – 2007, went on to a post-doc at Queen Mary College, University of London
- *Xi Li,* 2011-2013, went to be a Professor at College of Computer Science, Zhejiang University, China

Current Positions

Professor, School of Computer Science, University of Adelaide

Director, The Australian Institute for Machine Learning

Director, Punchcard (The Mesh Pit Pty Ltd)

Co-organiser with Michael Black of Scenes from Video Workshop (held in conjunction with ICCV every 2 years).

Italian Institute of Technology Standing Committee of External Evaluators member

Previous Positions

Associate Editor, Journal of Field Robotics special edition.

Area Chair, ACCV 2016

Area Chair, ICPR 2016

Co-organiser ICRA 2015 Ag Robotics Workshop

Deputy Chair, Adelaide SIGGRAPH Chapter

Member of The Computing Research and Education Association of Australasia Panel awarding the John Makepeace Bennett Award for Australasian Distinguished Doctoral

Dissertation, the best Computer Science PhD thesis each year.

Associate Editor for the IPSJ Transactions on Computer Vision and Applications

Guest Editor, International Journal of Automation and Computing (Springer), Special Issue on Massive Visual Computing, 2014

Director, SNAP Surveillance Pty Ltd, www.snapsurveillance.com, 2008-2015

Panel Member, Review of CVRG, NICTA, 2014

Visiting Researcher, Trinity College, Cambridge, UK, 2013

Guest editor of a Springer Virtual Reality journal special issue on Models for Mixed and Augmented Reality

Area Chair, IbPRIA 2011, The 5th Iberian Conference on Pattern Recognition and Image Analysis

Area Chair, DICTA 2011, Digital Image Computing: Techniques and Applications 2011

Area Chair, PSIVT2009, the 3rd Pacific-Rim Symposium on Image and Video Technology

Area Chair, International Conference on Digital Image Computing, Techniques and Applications 2009

Member, ARC Research Network for a Secure Australia

Member, ARC Research Network on Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP)

Technical Committee Chair, General, International Conference on Digital Image Computing, Techniques and Applications 2007

Chair, International Workshop on Parameter Estimation for Computer Vision Problems 2007

Head, Video Surveillance & Analysis Program, The Cooperative Research Centre for Sensor Signal and Information Processing, 2003-2006

Deputy head, Image Analysis Program, The Cooperative Research Centre for Sensor Signal and Information Processing, 2002-2006

Acting Head, Image Analysis program, The Cooperative Research Centre for Sensor Signal and Information processing, during 2003, 4, and 5.

Visiting Professor, Katholieke Universiteit Leuven, Belgium, 2004

Visiting Professor, Oxford-Brookes University, UK, 2004

Co-organiser, First Australia-Japan Advanced Workshop on Computer Vision 2003

Visiting Professor, Katholieke Universiteit Leuven, Belgium, 2001

Media

Can machines really tell us if we're sick, The Conversation, January 2017

Next Generation of Computers and Business - American Chamber of Commerce, September 2016