Peter Anderson

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EDUCATION

Australian National University (ANU) — Canberra, Australia
PhD, Computer Science — Feb 2015 – Apr 2018
Advisor: Prof. Stephen Gould
Thesis: *Vision and Language Learning: From Image Captioning and Visual Question Answering towards Embodied Agents*

University of New South Wales (UNSW) — Sydney, Australia
Bachelor of Computer Engineering — Mar 2009 – Dec 2012
1st class Honors and University Medal
(Spring 2011 exchange to University of Colorado, Boulder, USA)

University of Sydney (USYD) — Sydney, Australia
Bachelor of Commerce (Finance and Economics) — Mar 2000 – Dec 2004
1st class Honors and University Medal

RESEARCH INTERESTS

Computer Vision, Deep Learning, Natural Language Processing, Robotics

HONORS & AWARDS

Outstanding Reviewer Award, CVPR (Among the top 0.9% of reviewers) 2019

Outstanding Reviewer Award, NeurIPS (Among the top 3.6% of reviewers) 2018

Facebook ParlAI Research Award (1 of 7 awards) 2017

Winner, Visual Question Answering Challenge, CVPR 2017
(1st out of 24 teams from ∼26 institutions and ∼8 countries)

ANU Finalist, Three Minute Thesis (3MT) 2017
(Among the top 12 PhD thesis presenters from all ∼20 research schools at ANU)
[Video: Non-technical 3MT talk]

Australian Postgraduate Award (APA), ANU (PhD Scholarship) 2015–2018

Research Supplementary Scholarship, ANU (PhD Scholarship) 2015–2018

Runner Up, CiSRA Extreme Imaging Competition 2013
(For computer vision research on soccer robots with extremely limited resources)

3rd Place, RoboCup SPL using the Aldebaran Nao humanoid robot 2012
(3rd place and most goals scored out of 25 autonomous robot soccer teams from ∼17 countries)
[Video: rUNSWift 3rd place play-off]

Best Paper Finalist, RoboCup International Symposium 2012
(Selection Rate: 3/64 = 4.7%, for one of 4 papers from my undergraduate honors thesis)

1st class Honors and University Medal in Computer Eng, UNSW 2012
(Highest weighted average mark for 5 years in Bachelor of Computer Engineering)

Undergraduate Performance Award, UNSW 2012
(2nd out of ∼170 4th year students in the School of Computer Science and Engineering)

Faculty of Engineering Dean's Award, UNSW 2011-2012
(Awarded to Engineering students with a minimum High Distinction average)

UNSW Endeavour Exchange Scholarship 2011
(Funding for a six month exchange to the University of Colorado, Boulder)

1st class Honors and University Medal in Finance, USYD 2004
(Top student graduating with a major in Finance)

Joye Prize for 1st in Finance Honors, USYD 2004

Finance Honors Scholarship, USYD (Honors Year Scholarship) 2004

PROFESSIONAL EXPERIENCE

School of Interactive Computing, Georgia Tech Atlanta, USA
Research Scientist, with Devi Parikh and Dhruv Batra Jul 2018 – current
- Focusing on the intersection of vision and language with embodied agents.

Department of Computing, Macquarie University Sydney, Australia
Research Fellow, with Mark Johnson Apr 2018 – Jul 2018
- Extending image captioning models to understand more visual concepts.

Deep Learning Technology Center, Microsoft Research Seattle, USA
Research Intern, with Lei Zhang and Xiaodong He Apr 2017 – Jun 2017
- Developed bottom-up and top-down visual attention [9], now the de facto framework for a variety of vision and language tasks.

Sabre Autonomous Solutions Sydney, Australia
Robotic Software Engineer Feb 2014 – Feb 2015
- Advanced an autonomous grit-blasting robot from university prototype to commercial product.

FrameFish Sydney, Australia
Founder Jan 2013 – Feb 2014
- Developed & commercialized virtual try-on technology for glasses & sunglasses.

Wireless Networking Lab, CSIRO Sydney, Australia
Research Intern Nov 2011 – Feb 2012
- Prototyped filters to fuse an inertial sensor with a wireless positioning system.

Equities Research, Credit Suisse Sydney, Australia
Associate Jan 2005 – Mar 2009
- Sell-side analyst covering Australian financials including commercial banks, investment banks and diversified financials.

LATEST PREPRINTS

[20] Yuankai Qi, Qi Wu, **Peter Anderson**, Marco Liu, Chunhua Shen and Anton van den Hengel. *RERERE: Remote Embodied Referring Expressions in Real indoor Environments*, arXiv preprint 1904.10151, 2019

[19] **Peter Anderson**, Angel Chang, Devendra Singh Chaplot, Alexey Dosovitskiy, Saurabh Gupta, Vladlen Koltun, Jana Kosecka, Jitendra Malik, Roozbeh Mottaghi, Manolis Savva and Amir R. Zamir. *On Evaluation of Embodied Navigation Agents*, arXiv preprint 1807.06757, 2018

[18] Sanyam Agarwal, Devi Parikh, Dhruv Batra, **Peter Anderson** and Stefan Lee. *Visual Landmark Selection for Generating Grounded and Interpretable Navigation Instructions*, in CVPR workshop on Deep Learning for Semantic Visual Navigation, 2019

*denotes equal contribution

CONFERENCE PUBLICATIONS [Google Scholar]

[17] **Peter Anderson***, Ayush Shrivastava*, Devi Parikh, Dhruv Batra and Stefan Lee. *Chasing Ghosts: Instruction Following as Bayesian State Tracking*, in Advances in Neural Information Processing Systems (NeurIPS), 2019

[16] Harsh Agrawal*, Karan Desai*, Yufei Wang, Xinlei Chen, Rishabh Jain, Mark Johnson, Dhruv Batra, Devi Parikh, Stefan Lee and **Peter Anderson**. *nocaps: novel object captioning at scale*, in International Conference on Computer Vision (ICCV), 2019

[15] Huda Alamri, Vincent Cartillier, Abhishek Das, Jue Wang, Anoop Cherian, Irfan Essa, Dhruv Batra, Tim K. Marks, Chiori Hori, **Peter Anderson**, Stefan Lee and Devi Parikh. *Audio-Visual Scene-Aware Dialog*, in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2019

[14] Ashwin Kalyan, **Peter Anderson**, Stefan Lee and Dhruv Batra. *Trainable Decoding of Sets of Sequences for Neural Sequence Models*, in International Conference on Machine Learning (ICML), 2019

[13] **Peter Anderson**, Stephen Gould and Mark Johnson. *Partially-Supervised Image Captioning*, in Advances in Neural Information Processing Systems (NeurIPS), 2018

[12] Paria Jamshid Lou, **Peter Anderson** and Mark Johnson. *Disfluency Detection using Auto-Correlational Neural Networks*, in Conference on Empirical Methods in Natural Language Processing (EMNLP), 2018

[11] Mark Johnson, **Peter Anderson**, Mark Dras and Mark Steedman. *Predicting accuracy on large datasets from smaller pilot data*, in Proceedings of the Annual Meeting of the Association for Computational Linguistics (ACL), 2018
(Oral Presentation)

[10] **Peter Anderson**, Qi Wu, Damien Teney, Jake Bruce, Mark Johnson, Niko Sünderhauf, Ian Reid, Stephen Gould and Anton van den Hengel. *Vision-and-Language Navigation: Interpreting visually-grounded navigation instructions in real environments*, in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018
(Spotlight Presentation; Selection Rate: 294/3309 = 8.9%) [Video]

[9] **Peter Anderson**, Xiaodong He, Chris Buehler, Damien Teney, Mark Johnson, Stephen Gould and Lei Zhang. *Bottom-Up and Top-Down Attention for Image Captioning and Visual Question Answering*, in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018
(Oral Presentation; Selection Rate: 70/3309 = 2.1%) [Video]

[8] Damien Teney, **Peter Anderson**, Xiaodong He and Anton van den Hengel. *Tips and Tricks for Visual Question Answering: Learnings from the 2017 Challenge*, in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018

[7] **Peter Anderson**, Basura Fernando, Mark Johnson and Stephen Gould. *Guided Open Vocabulary Image Captioning with Constrained Beam Search*, in Conference on Empirical Methods in Natural Language Processing (EMNLP), 2017

[6] **Peter Anderson**, Basura Fernando, Mark Johnson and Stephen Gould. *SPICE: Semantic Propositional Image Caption Evaluation*, in Proceedings of the European Conference on Computer Vision (ECCV), 2016

[5] Basura Fernando, **Peter Anderson**, Marcus Hutter and Stephen Gould. *Discriminative Hierarchical Rank Pooling for Activity Recognition*, in Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2016

[4] **Peter Anderson**, Youssef Hunter and Bernhard Hengst. *An ICP Inspired Inverse Sensor Model with Unknown Data Association*, in Proceedings of the IEEE International Conference on Robotics and Automation (ICRA), 2013

[3] **Peter Anderson** and Bernhard Hengst. *Fast Monocular Visual Compass for a Computationally Limited Robot*, in Proceedings of the RoboCup International Symposium, 2013
(Oral Presentation)

[2] Sean Harris, **Peter Anderson**, Belinda Teh, Youssef Hunter, Roger Liu, Bernhard Hengst, Ritwik Roy, Sam Li and Carl Chatfield. *RoboCup Standard Platform League – rUNSWift 2012 Innovations*, in Proceedings of the Australasian Conference on Robotics and Automation (ACRA), 2012

[1] **Peter Anderson**, Yongki Yusmanthia, Bernhard Hengst, and Arcot Sowmya. *Robot Localisation using Natural Landmarks*, in Proceedings of the RoboCup International Symposium, 2012
(Oral Presentation, Best Paper Finalist: Selection Rate: 3/64 = 4.7%)

INVITED TALKS

The Increasingly Real Problem of Grounded Language Learning
Facebook AI Research (FAIR), Menlo Park, USA — Aug 2019
Google Research, Mountain View, USA — Aug 2019

Both Sides Now: Generating and Understanding Visually-Grounded Language
Allen Institute for Artificial Intelligence (AI2), Seattle, USA — Apr 2019
Microsoft Research, Redmond, USA — Apr 2019

Vision and language: attention, navigation, and making it work 'in the wild'
Vision and Language Seminar, ACVT, University of Adelaide, Aus. — Jul 2018
Visual Question Answering Challenge Workshop — CVPR 2018

Language and Vision using Deep Neural Nets
CLaS-CCD Research Colloquium, Macquarie University, Sydney, Aus. — Jun 2018

Visual Understanding in Natural Language
University of Toronto, Toronto, CA — Dec 2017
Microsoft Research, Redmond, USA — Dec 2017
Georgia Tech, Atlanta, USA — Nov 2017

VQA Challenge Winner Talk
Visual Question Answering Challenge Workshop — CVPR 2017

Guided Open Vocabulary Image Captioning with Constrained Beam Search
ACVT, University of Adelaide, Adelaide, Australia — Nov 2016

SPICE: Semantic Propositional Image Caption Evaluation
ACRV Science Day, Queensland Uni. of Technology, Brisbane, Aus. — Aug 2016

A Practical Introduction to Deep Learning with Caffe
Deep Learning Workshop — AI/ACRA 2015

TEACHING

CS 7643 Deep Learning (Georgia Tech) - 3 guest lectures — Spring 2019
CS 4476 Intro. to Computer Vision (Georgia Tech) - 4 guest lectures — Fall 2018
CS 7643 Deep Learning (Georgia Tech) - 3 guest lectures — Fall 2018

ADVISING

Advised on individual projects at Georgia Tech:
PhD students: Harsh Agarwal [16], Prithviraj Ammanabrolu, Meera Hahn
Interns: Karan Desai [16], Ayush Shrivastava [17], Sanyam Agarwal [18]
Undergrads (CS 8903 Special Problems): Arda Pekis, Vineet Vinayak

PROFESSIONAL ACTIVITIES

Area Chair: NeurIPS 2019

Reviewer: CoRL 2019, CoNLL 2019, EMNLP 2019, ICCV 2019, IROS 2019, ICRA 2019, ICML 2019, ICLR 2019, NeurIPS 2018, CVPR 2018-19, ECCV 2018

Workshop organization:

Visual Question Answering and Dialog Workshop	CVPR 2019
Habitat Embodied Agents Workshop	CVPR 2019
Visually-Grounded Interaction and Language (ViGIL)	NeurIPS 2018
Visual Learning and Embodied Agents in Simulation Environments	ECCV 2018
New Benchmarks, Metrics, and Competitions for Robotic Learning	RSS 2018

Panelist at Workshops:

Visual Question Answering Challenge Workshop	CVPR 2018

Tutorials:

Connecting Language and Vision to Actions	ACL 2018

REFEREES

Prof. Devi Parikh, Georgia Tech/Facebook AI Research (parikh@gatech.edu)
Prof. Dhruv Batra, Georgia Tech/Facebook AI Research (dbatra@gatech.edu)
Prof. Stephen Gould, ANU (stephen.gould@anu.edu.au)
Prof. Mark Johnson, Macquarie University (mark.johnson@mq.edu.au)
Prof. Anton van den Hengel, Uni. of Adelaide (anton.vandenhengel@adelaide.edu.au)