

# Peter Anderson

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July 2019

EDUCATION	<b>Australian National University (ANU)</b> <i>PhD, Computer Science</i> Advisor: Prof. Stephen Gould Thesis: <i>Vision and Language Learning: From Image Captioning and Visual Question Answering towards Embodied Agents</i>	Canberra, Australia Feb 2015 – Apr 2018
	<b>University of New South Wales (UNSW)</b> <i>Bachelor of Computer Engineering</i> 1st class Honors and University Medal (Spring 2011 exchange to University of Colorado, Boulder, USA)	Sydney, Australia Mar 2009 – Dec 2012
	<b>University of Sydney (USYD)</b> <i>Bachelor of Commerce (Finance and Economics)</i> 1st class Honors and University Medal	Sydney, Australia Mar 2000 – Dec 2004
RESEARCH INTERESTS	Computer Vision, Deep Learning, Natural Language Processing, Robotics	
HONORS & AWARDS	<b>Outstanding Reviewer Award, CVPR</b> (Among the top 0.9% of reviewers)	2019
	<b>Outstanding Reviewer Award, NeurIPS</b> (Among the top 3.6% of reviewers)	2018
	<b>Facebook ParLAI Research Award</b> (1 of 7 awards)	2017
	<b>Winner, Visual Question Answering Challenge, CVPR</b> (1st out of 24 teams from ~26 institutions and ~8 countries)	2017
	<b>ANU Finalist, Three Minute Thesis (3MT)</b> (Among the top 12 PhD thesis presenters from all ~20 research schools at ANU) [Video: Non-technical 3MT talk]	2017
	<b>Australian Postgraduate Award (APA), ANU</b> (PhD Scholarship)	2015–2018
	<b>Research Supplementary Scholarship, ANU</b> (PhD Scholarship)	2015–2018
	<b>Runner Up, CiSRA Extreme Imaging Competition</b> (For computer vision research on soccer robots with extremely limited resources)	2013
	<b>3rd Place, RoboCup SPL</b> using the Aldebaran Nao humanoid robot (3rd place and most goals scored out of 25 autonomous robot soccer teams from ~17 countries) [Video: rUNSWift 3rd place play-off]	2012
	<b>Best Paper Finalist, RoboCup International Symposium</b> (Selection Rate: $3/64 = 4.7\%$ , for one of 4 papers from my undergraduate honors thesis)	2012
	<b>1st class Honors and University Medal in Computer Eng, UNSW</b> (Highest weighted average mark for 5 years in Bachelor of Computer Engineering)	2012
	<b>Undergraduate Performance Award, UNSW</b> (2nd out of ~170 4th year students in the School of Computer Science and Engineering)	2012
	<b>Faculty of Engineering Dean's Award, UNSW</b> (Awarded to Engineering students with a minimum High Distinction average)	2011-2012
	<b>UNSW Endeavour Exchange Scholarship</b> (Funding for a six month exchange to the University of Colorado, Boulder)	2011

<b>1st class Honors and University Medal in Finance, USYD</b> (Top student graduating with a major in Finance)	2004
<b>Joye Prize for 1st in Finance Honors, USYD</b>	2004
<b>Finance Honors Scholarship, USYD</b> (Honors Year Scholarship)	2004

<b>PROFESSIONAL EXPERIENCE</b>	<b>School of Interactive Computing, Georgia Tech</b>	Atlanta, USA
	<i>Research Scientist</i> , with Devi Parikh and Dhruv Batra	Jul 2018 – current
	<ul style="list-style-type: none"> <li>Focusing on the intersection of vision and language with embodied agents.</li> </ul>	
	<b>Department of Computing, Macquarie University</b>	Sydney, Australia
	<i>Research Fellow</i> , with Mark Johnson	Apr 2018 – Jul 2018
	<ul style="list-style-type: none"> <li>Extending image captioning models to understand more visual concepts.</li> </ul>	
	<b>Deep Learning Technology Center, Microsoft Research</b>	Seattle, USA
	<i>Research Intern</i> , with Lei Zhang and Xiaodong He	Apr 2017 – Jun 2017
	<ul style="list-style-type: none"> <li>Developed bottom-up and top-down visual attention [9], now the de facto framework for a variety of vision and language tasks.</li> </ul>	
	<b>Sabre Autonomous Solutions</b>	Sydney, Australia
	<i>Robotic Software Engineer</i>	Feb 2014 – Feb 2015
	<ul style="list-style-type: none"> <li>Advanced an autonomous grit-blasting robot from university prototype to commercial product.</li> </ul>	
	<b>FrameFish</b>	Sydney, Australia
	<i>Founder</i>	Jan 2013 – Feb 2014
	<ul style="list-style-type: none"> <li>Developed &amp; commercialized virtual try-on technology for glasses &amp; sunglasses.</li> </ul>	
	<b>Wireless Networking Lab, CSIRO</b>	Sydney, Australia
	<i>Research Intern</i>	Nov 2011 – Feb 2012
	<ul style="list-style-type: none"> <li>Prototyped filters to fuse an inertial sensor with a wireless positioning system.</li> </ul>	
	<b>Equities Research, Credit Suisse</b>	Sydney, Australia
	<i>Associate</i>	Jan 2005 – Mar 2009
	<ul style="list-style-type: none"> <li>Sell-side analyst covering Australian financials including commercial banks, investment banks and diversified financials.</li> </ul>	

## LATEST PREPRINTS

- [20] **Peter Anderson\***, Ayush Shrivastava\*, Devi Parikh, Dhruv Batra and Stefan Lee. *Chasing Ghosts: Instruction Following as Bayesian State Tracking*, arXiv preprint 1907.02022, 2019
- [19] 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
- [18] 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*, arXiv preprint 1812.08658, 2019
- [17] **Peter Anderson**, Angel Chang, Devendra Singh Chaplot, Alexey Dosovitskiy, Saurabh Gupta, Vladlen Koltun, Jana Kosecka, Jitendra Malik, Roozbeh Motlaghi, Manolis Savva and Amir R. Zamir. *On Evaluation of Embodied Navigation Agents*, arXiv preprint 1807.06757, 2018

- [16] 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]

- [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

*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 [18], Prithviraj Ammanabrolu, Meera Hahn  
Interns: Karan Desai [18], Ayush Shrivastava [20], Sanyam Agarwal [16]  
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
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*Tutorials:*

Connecting Language and Vision to Actions	ACL 2018
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**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)