

**EDUCATION****Doctor of Philosophy in Robotics (Ph.D.)** (Aug 2016–May 2022)

Carnegie Mellon University

The Robotics Institute, Pittsburgh, USA

Thesis: Amodal Visual Scene Representations With and Without Geometry

Advisor: Dr. Katerina Fragkiadaki

**Master of Science in Computer Science (MS)** (Aug 2014–Jan 2016)

Ryerson University, Toronto, Canada

Thesis: Segmentation-Aware Convolutional Nets

Advisor: Dr. Konstantinos Derpanis

Distinction: Ryerson Gold Medal

**Bachelor of Arts in Psychology (BA)** (Aug 2008–Jan 2012)

Ryerson University, Toronto, Ontario

Thesis: The Effect of Cognitive Switching on Sustained Attention

Advisor: Dr. Benjamin Dyson

Distinction: Honours

**PEER-REVIEWED PUBLICATIONS**

20. **Harley, A.W.**, Fang, Z., Fragkiadaki, K., 2022. Particle Video Revisited: Tracking Through Occlusions Using Point Trajectories. *ECCV 2022 (Oral)*. <https://arxiv.org/abs/2204.04153>
19. **Harley, A.W.**, Zuo, Y., Wen, J., Mangal, A., Potdar, S., Chaudhry, R., Fragkiadaki, K., 2021. Track, Check, Repeat: An EM Approach to Unsupervised Tracking. *Computer Vision and Pattern Recognition (CVPR)*. [http://www.cs.cmu.edu/~aharley/em\\_cvpr21.pdf](http://www.cs.cmu.edu/~aharley/em_cvpr21.pdf)
18. Lal, S., Prabhudesai, M., Mediratta, I., **Harley, A.W.**, Fragkiadaki, K., 2021. CoCoNets: Continuous Contrastive 3D Scene Representations. *Computer Vision and Pattern Recognition (CVPR)*. [http://www.cs.cmu.edu/~aharley/coco\\_cvpr21.pdf](http://www.cs.cmu.edu/~aharley/coco_cvpr21.pdf)
17. Fang, Z., Jain, A., Sarch, G., **Harley, A.W.**, Fragkiadaki, K., 2021. Move to See Better: Self-Improving Embodied Object Detection. *BMVC 2021*. <https://arxiv.org/abs/2012.00057>
16. Prabhudesai, M., Lal, S., Patil, D., Tung, H.-Y., **Harley, A.W.**, Fragkiadaki, K., 2021. Disentangling 3D Prototypical Networks For Few-Shot Concept Learning. *International Conference on Learning Representations (ICLR)*. <https://openreview.net/pdf?id=-Lr-u0b42he>
15. **Harley, A.W.**, Lakshmikanth, S. K., Schydlo, P., Fragkiadaki, K., 2020. Tracking Emerges by Looking Around Static Scenes, with Neural 3D Mapping. *European Conference on Computer Vision (ECCV)*. <https://arxiv.org/abs/2008.01295>
14. Prabhudesai, M., Lal, S., Tung, H.-Y. F., **Harley, A.W.**, Potdar, S., Fragkiadaki, K., 2020. 3D Object Recognition By Corresponding and Quantizing Neural 3D Scene Representations. *Computer Vision and Pattern Recognition (CVPR) Workshops*. <https://arxiv.org/abs/2010.16279>
13. Prabhudesai, M., Lal, S., Tung, H.-Y. F., Javed, S. A., Sieb, M., **Harley, A.W.**, Fragkiadaki, K., 2020. Embodied Language Grounding With 3D Visual Feature Representations. *Computer Vision and Pattern Recognition (CVPR)*.
12. **Harley, A.W.**, Lakshmikanth, S. K., Li, F., Zhou, X., Tung, H.-Y. F., Fragkiadaki, K., 2020. Learning from Unlabelled Videos Using Contrastive Predictive Neural 3D Mapping. *International Conference on Learning Representations (ICLR)*. <https://arxiv.org/abs/1906.03764>

11. Wei, S.-E., Saragih, J., Simon, T., **Harley, A.W.**, Lombardi, S., Perdoch, M., Hypes, A., Wang, D., Badino, H., Sheikh, Y., 2020. VR facial animation via multiview image translation. *ACM Transactions on Graphics (SIGGRAPH)*.
10. **Harley, A.W.**, Wei, S.-E., Saragih, J., Fragkiadaki, K., 2019. Image Disentanglement and Uncooperative Re-Entanglement for High-Fidelity Image-to-Image Translation. *International Conference on Computer Vision (ICCV) Workshops*. <https://arxiv.org/abs/1901.03628>
9. Tung, H.-Y. F., **Harley, A.W.**, Huang, L.-K., Fragkiadaki, K., 2018. Reward Learning from Narrated Demonstrations. *Computer Vision and Pattern Recognition (CVPR)*. <https://arxiv.org/abs/1804.10692>
8. Tung, H.-Y. F.\*, **Harley, A.W.\***, Seto, W.\*, Fragkiadaki, K., 2017. Adversarial Inverse Graphics Networks: Learning 2D-to-3D Lifting and Image-to-Image Translation from Unpaired Supervision. *International Conference on Computer Vision (ICCV)*. (asterisks indicate equal contribution) <https://arxiv.org/abs/1705.11166>
7. **Harley, A. W.**, Derpanis, K. G., and Kokkinos, I., 2017. Segmentation-Aware Convolutional Networks Using Local Attention Masks. *International Conference on Computer Vision (ICCV)*. <https://arxiv.org/abs/1708.04607>
6. Yu, J. J., **Harley, A. W.**, and Derpanis, K. G., 2016. Back to Basics: Unsupervised Learning of Optical Flow via Brightness Constancy and Motion Smoothness. *European Conference on Computer Vision (ECCV) Workshops*. <https://arxiv.org/abs/1608.05842>
5. **Harley, A. W.**, Derpanis, K. G., and Kokkinos, I., 2016. Learning Dense Convolutional Embeddings for Semantic Segmentation. *International Conference on Learning Representations (ICLR) Workshops*. <http://arxiv.org/abs/1511.04377>
4. **Harley, A. W.**, 2015. An Interactive Node-Link Visualization of Convolutional Neural Networks. *International Symposium on Visual Computing (ISVC)*. <http://scs.ryerson.ca/~aharley/vis/> **Featured in Popular Science**
3. **Harley, A. W.**, Ufkes, A., Derpanis, K. G., 2015. Evaluation of Deep Convolutional Nets for Document Image Classification and Retrieval. *International Conference on Document Analysis and Recognition (ICDAR)*. <http://scs.ryerson.ca/~aharley/icdar15/> **Best Student Paper Award**
2. **Harley, A. W.**, Dyson, B., 2013. Separating Stimulus, Goal and Response Switching During a Fast-Paced Sustained Attention Task. *Psychonomic Society Annual Meeting*, Volume 18, p. 258.
1. **Harley, A. W.**, 2012. The Effect of Cognitive Switching on Sustained Attention. *42nd Annual Ontario Undergraduate Psychology Thesis Conference*, 2012.

## **WORK EXPERIENCE**

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|------|--|
| 2019 | Uber ATG, with Dr. Ersin Yumer<br>Topic: Geometry-aware photo-realistic simulation of urban scene videos   |
| 2018 | Facebook Reality Labs / Oculus Research, with Dr. Shih-En Wei, Dr. Jason Saragih<br>Topic: GANs for high-fidelity cross-domain image translation                     |
| 2015 | INRIA-Saclay, Center for Visual Computing (Paris), with Dr. Iasonas Kokkinos<br>Topic: Attention mechanisms within CNNs, for spatially precise semantic segmentation |

## **HONORS AND AWARDS**

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| 2021    | Highlighted Reviewer, ICLR 2021  |
| 2019    | Best Reviewer, ICCV 2019   |
| 2018-20 | NSERC Postgraduate Scholarship – Doctorate (PGS-D; \$42,000)                 |
| 2018    | Qualcomm Innovation Fellowship Finalist                                      |
| 2016    | Ryerson Gold Medal (Ryerson University's highest honour)                     |
| 2016    | Nominated for The Governor General Gold Medal at Ryerson                     |
| 2015    | Queen Elizabeth II Graduate Scholarship in Science and Technology (\$15,000) |
| 2015    | ICDAR Best Student Paper Award (\$375)                                       |
| 2015    | Ryerson Graduate Development Award (\$2,000)                                 |
| 2015    | Mitacs Globalink Research Award – Inria (\$5,000)                            |

2014 Ryerson Graduate Fellowship (\$3,750)  
2014 NSERC Undergraduate Student Research Award (USRA; \$4,500)  
2012 CPA Certificate of Academic Excellence for Undergraduate Thesis  
2009-14 Ryerson Dean's List

#### **ACADEMIC AND ADMINISTRATIVE EXPERIENCE**

2020 Co-organized ECCV 2020 workshop: "Perception Through Structured Generative Models"  
2020 Co-organized CVPR 2020 workshop: "How far are we from the common sense of a toddler?"  
2016-20 Reviewer for CVPR, ECCV, ICCV, WACV, ICML, NeurIPS, CoRL, ICLR, 3DV, TPAMI  
2019 Teaching assistant: 16-720: Computer Vision  
2018 Teaching assistant: 16-831: Statistical Techniques in Robotics  
2015 Guest speaker at German Research Center for Artificial Intelligence (DFKI)  
2014-15 Teaching assistant: CS 1, Computer Graphics, Introduction to Computer Vision, AI 1.  
2014-15 Faculty of Science representative in funding committee, Ryerson University (volunteer)  
2014 Competitor at ACM International Collegiate Programming Contest.  
2014 Guest speaker at Ryerson Competitive Programming Club

#### **REFERENCES**

Dr. Katerina Fragkiadaki, Asst. Prof., Machine Learning Dept., Carnegie Mellon University; [katef@cs.cmu.edu](mailto:katef@cs.cmu.edu)  
Dr. Christopher G. Atkeson, Prof., Robotics Institute, Carnegie Mellon University; [cga@cmu.edu](mailto:cga@cmu.edu)  
Dr. Shih-En Wei, Research Scientist, Reality Labs, Meta; [swei@fb.com](mailto:swei@fb.com)  
Dr. Konstantinos Derpanis, Assoc. Prof., Dept. of Computer Science, Ryerson University; [kosta@scs.ryerson.ca](mailto:kosta@scs.ryerson.ca)  
Dr. Iasonas Kokkinos, Assoc. Prof., Dept. of Computer Science, University College London; [i.kokkinos@cs.ucl.ac.uk](mailto:i.kokkinos@cs.ucl.ac.uk)