

Matthew Kowal, B.A.Sc, M.Sc, Ph.D Student

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🌐 <https://mkowal2.github.io/>

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Employment History

- 2021 – 📌 **Technical Lead @ Vector Institute** - Lead and managed a team of industry data-scientists to complete a year-long computer vision project on video understanding.
- 2020 – 📌 **Scientist in Residence @ NextAI** - Technical consultant for AI-based startups. Provided support on the implementation of state-of-the-art deep learning algorithms for various industry applications.
- 2018 – 📌 **Teaching Assistant @ Ryerson University** - TA support (e.g., marking, supervised course projects, helped with lectures) for the following classes: Machine Learning×2, Reinforcement Learning, Computer Vision×2, Advanced Algorithms×2, Big Data.
- 2018 – 2018 📌 **Research Assistant @ Baylor University** - Assisted in research on relativistic properties of temperature, heat conduction, thermal diffusivity.
- 2017 – 2018 📌 **Mechanical Engineer in Training (EiT) @ Morrison Hershfield** - Analysis and design of mechanical systems: controls, electrical, HVAC, hydro, fire protection.
- 2015 – 2016 📌 **Structural Assistant (summer position) @ Morrison Hershfield** - Conducted bridge inspections in office and on site. Half-cell testing, coring, and deformation analysis. Soffit, deck, and abutment mapping.

Education

- 2020 – 📌 **Ph.D. Computer Science, Ryerson University** Deep Learning and Computer Vision. Supervisor: Dr. Kosta G. Derpanis
- 2018 – 2020 📌 **M.Sc. Computer Science, Ryerson University** Deep Learning and Computer Vision. Thesis title: *An Evaluation of Modalities for Action Recognition*. Supervisors: Dr. Kosta G. Derpanis and Dr. Neil Bruce
- 2013 – 2017 📌 **B.A.Sc. Applied Mathematics and Engineering, Queens University** Capstone title: *Region Tracking in an Image Sequence: Preventing Driver Inattention*. Awarded Keyser Award for best capstone project in discipline.

Research Publications

Journal Articles

- 1 Islam, A., Kowal, M., Jia, S., Derpanis, K., & Bruce, N. (2021a). Position, Padding and Predictions: A Deeper Look at Position Information in CNNs. *IEEE Transactions on Pattern Analysis and Machine Intelligence (under review)*. Retrieved from 🔗 <https://arxiv.org/abs/2101.12322>
- 2 Kowal, M., Sandison, G., Yabuki-Soh, L., & la Bastide, R. (2017). Region Tracking in an Image Sequence: Preventing Driver Inattention. *Arxiv Pre-print*. Retrieved from 🔗 <https://arxiv.org/abs/1908.08914>

Conference Proceedings

- 1 Islam, A., Kowal, M., Esser, P., Jia, S., Ommer, B., Derpanis, K., & Bruce, N. (2021). Shape or Texture: Understanding Discriminative Features in CNNs. In *International Conference on Learning Representations*. Retrieved from <https://arxiv.org/abs/2101.11604>
- 2 Islam, A., Kowal, M., Jia, S., Derpanis, K., & Bruce, N. (2021b). Simpler Does It: Generating Semantic Labels with Objectness Guidance. In *IEEE Conference on Computer Vision and Pattern Recognition (under review)*.
- 3 Islam, A., Kowal, M., Derpanis, K., & Bruce, N. (2020). Feature Binding with Category-Dependant MixUp for Semantic Segmentation and Adversarial Robustness. In *British Machine Vision Conference (Oral)*. Retrieved from <https://arxiv.org/abs/2008.05667>
- 4 Keimakh, D., Kowal, M., & Haibe-Kains, B. (2020). An Analysis of Structural Variant Callers. In *Cancer Big Data and AI Conference*.

Skills

Coding	Python, Bash, MATLAB, \LaTeX .
Library's	PyTorch, NumPy, TensorFlow, PIL, OpenCV, SciPy.
OS	Linux, MacOS, and Windows.
Communication	Strong ability to communicate or present technical concepts in an engaging manner.
Misc.	Academic research, consulting, teaching, tutoring.
Hobbies.	In order of skill: calisthenics, baseball pitcher (4 years on Queen's varsity team), competitive Super Smash Bros. Melee, close up magic, skateboarding, trail running, meditation, rock climbing, birding, gardening.

Miscellaneous Experience

Awards and Achievements

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| 2020 | Ontario Graduate Scholarship (OGS) , Ryerson University (\$15,000). Accepted. |
| 2017 | Keyser Award , Queen's University (\$1,000) - Best capstone project in Applied Mathematics and Engineering discipline. Accepted. |
| 2013 | Queen's Excellence Scholarship , Queen's University (\$8,000). Accepted. |

References

Available on Request