

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

✉ matt2kowal@gmail.com 🐦 @MatthewKowal9
🌐 <https://mkowal2.github.io/>
🌐 <https://www.linkedin.com/in/mkowal2/>



Selected Experience

- 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.
 📌 **Organizing Chair @ OWCV** - Co-founder and organizing chair of the Ontario Workshop on Computer Vision, a student-focused workshop for computer vision researchers in Ontario. OWCV Website.
- 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. (2021). 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., 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>
- 3 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, L ^A T _E X.
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.

Awards and Achievements

2021	Vector Postgraduate Affiliate (PGA) , Vector Institute, Toronto (\$12,000). Affiliate status for two year term. Accepted.
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