



Passionate about building collaborative agents that use vision, ML, and robotics to automate complex tasks, learn from real-world data, and work seamlessly alongside humans.

[WORK EXPERIENCE HIGHLIGHTS]

Meta: Computer Vision Engineer

February 2021 – present

- ❖ *World-Locked Quality*: led design and development of a computer vision and robotics system to **measure spatial-temporal perceptual artifacts** (i.e. jitter, swim, bias) in AR/MR, enabling “through-the-lens” detection of **system-level regressions** in perceptual quality for Meta’s Orion AR glasses.
- ❖ *Perceptual Manufacturing Quality*: led development of a vision system to **quantify geometric display** artifacts (e.g. augmentation error, binocular disparity error, lateral color aberration) in AR/MR; deploying to **verify calibration quality** of devices at factory against user performance specifications.

Element AI: Research Scientist; Robotics Program Lead

March 2017 – December 2020

- ❖ *RL-Assisted Vehicle Design*: led experimentation to improve sample efficiency for computational vehicle design, which **jointly optimized agent behavior and design** by leveraging the Soft Actor-Critic (SAC) algorithm.
- ❖ *Learning to “Fly”*: co-developed a RL gym environment around a black-box vehicle simulator and learned efficient “flying” policies using Tune + RLlib libraries on AWS SageMaker cluster, which **taught novel maneuvers** that helped a client sports team **win a prestigious international competition**.
- ❖ *Physical Adversarial Textures for Fooling Visual Tracking*: supervised a research intern and co-developed a method to robustly **fool visual object trackers** into losing track of their target and locking onto inconspicuous-looking textured billboards.

[REFEREED PUBLICATION HIGHLIGHTS]

- ❖ R. Wiyatno and A. Xu. Physical Adversarial Textures that Fool Visual Object Tracking, in *CVF/IEEE International Conference on Computer Vision (ICCV '19)*, Seoul, South Korea, 2019.
- ❖ A. Xu and G. Dudek. Maintaining Efficient Collaboration with Trust-Seeking Robots, in *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'16)* (**finalist for the IROS KROS Best Paper Award on Cognitive Robotics**), pp. 3312-3319, Daejeon, South Korea, 2016.
- ❖ D. Meger, J. Gamboa, A. Xu, P. Giguère, and G. Dudek. Learning Legged Swimming Gaits from Experience, in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA'15)* (**finalist for the Best Conference Paper Award**), pp. 2332-2338, Seattle, USA, 2015.
- ❖ A. Xu and G. Dudek. OPTIMO: Online Probabilistic Trust Inference Model for Asymmetric Human-Robot Collaborations, in *Proc. of the ACM/IEEE International Conference on Human-Robot Interaction (HRI'15)*, pp. 221-228, Portland, USA, 2015.

[EDUCATION]

Ph.D. in Computer Science, McGill University, Canada.
 Thesis: Efficient Collaboration with Trust-Seeking Robots
 Supervisor: Professor Gregory Dudek
 CGPA: **4.00** (out of 4.00)

2008 – 2017

[LANGUAGES]

- ❖ English: fluent
- ❖ French: conversational
- ❖ Chinese Mandarin: conversational

[TECHNICAL KNOWLEDGE]

- ❖ Computer Vision: experience with both classical and learning-based techniques, including object detection, 2D feature extraction, 3D geometry, and fiducial detection and design
- ❖ Machine Learning: experience with supervised learning, unsupervised clustering, reinforcement learning, deep neural networks, and probabilistic graphical models
- ❖ Robotics: experience with core algorithms for localization, SLAM, planning, and control
- ❖ Experimental Research: skilled in designing, conducting, and managing robotics field experiments and controlled studies involving human participants

[SOFTWARE DEVELOPMENT SKILLS]

- ❖ Programming languages: fluent in Python and C++
- ❖ Libraries & frameworks: experience with OpenCV, ROS, NumPy, PyTorch, Gazebo, matplotlib, plotly, Qt
- ❖ Development tools & environments: proficient in git, hg, CMake, Jupyter, Docker, WSL, Linux

[RESEARCH COMMUNITY INVOLVEMENT]

- ❖ Program co-chair for [CRV 2018](#) and [CRV 2019](#)
- ❖ Reviewer for ICRA, IROS, RSS, RA-L, HRI, CoRL, CRV, ICCV, IJRR, AURO, ...
- ❖ Developer of the [ueye_cam ROS package](#) for IDS uEye cameras

[ROBOTICS SYSTEMS EXPERIENCE]

- ❖ Extensive experience in software development, field deployment, electronics integration, and platform maintenance with:
 - Jaco2 and Gen3 manipulators by Kinova (www.kinovarobotics.com)
 - the Aqua family of amphibious robots by McGill University & Independent Robotics (www.aquarobot.net)
 - the Kingfisher unmanned surface vessel by Clearpath Robotics (www.clearpathrobotics.com/kingfisher)
 - the Unicorn UAV by Lockheed Martin Procerus Technologies (www.lockheedmartin.com/procerus)
 - the Pelican quadrotor by Ascending Technologies (www.asctec.de)
 - the AR.Drone and Bebop lines of quadrotors by Parrot Technologies (ardrone.parrot.com)
 - the Tello quadrotor by DJI / Ryze Robotics (www.ryzerobotics.com/tello)
 - the Husky wheeled robot by Clearpath Robotics (www.clearpathrobotics.com/husky)