David Szczecina

david.szczecina@uwaterloo.ca | (647)-449-5825 | www.david-s.ca | github.com/davidszczecina

Experience

Computer Vision Engineer, *Miovision* May 2025 – April 2025

- Built a Deep Learning pipeline for Semantic Segmentation of poor-visibility regions in traffic video streams
- Trained a classifier to flag frames with degraded tracking performance due to adverse visibility conditions
- Improved multi-object tracking by modeling occlusions and using temporal cues to track occluded objects

Artificial Intelligence Researcher, *UW Vision and Image Processing Lab* Sept 2023 – Current

- Published award winning AI research paper at Conference of Vision and Intelligent Systems (CVIS 2024)
- Invented 2 new Loss Functions that are robust to label error, increasing label error detection rates by 13%
- Analyzed the effect of mislabelled data on accuracy and loss in common ML datasets
- Increased Deep Learning model accuracy using Confident Learning for error detection in datasets

Machine Learning Engineer, *Northern Digital Inc.* Jan 2025 – April 2025

- Architected a Gaussian-Splat reconstruction pipeline to generate photorealistic 3D models from 2D images
- Developed a custom Structure-from-Motion workflow for real time Time-of-Flight point-cloud registration
- Achieved sub-millimeter 6-DoF tracking accuracy by optimizing pose estimation through real-time CV filters
- Implemented a CNN-based anomaly detector to monitor and flag drift in medical-device tracking accuracy

Backend Software Engineer, *Magna International* April 2024 – Aug 2024

- Developed a scalable TCP data processing framework and SQL database for machine state tracking, resulting in the collection of 750 million data samples per day and annual savings of $350k
- Optimized server for high-volume data using asynchronous connections to handle concurrent clients
- Integrated AI processing using cloud computing for predictive analytics and downtime prevention

Software Engineer, *Toyota Motor Manufacturing* Sept 2023 – Dec 2023

- Programmed a machine vision system to control a 6-axis robot arm, automating 3 manual positions
- Developed machine learning-based vision systems for defect detection, improving accuracy by 18%
- Decreased equipment downtime by 40% through root cause analysis and reprogramming machinery
- Automated audio verification processes using Digital Signal Processing, automating 2 manual positions

Featured Publications

Pre-train to Gain: Robust Learning Without Clean Labels
Conference on Vision and Intelligent Systems; **D. Szczecina**, N. Pellegrino, P. Fieguth
Published at CVIS 2025; **Best AI Paper award** Dec 2025

Loss Functions Robust to the Presence of Label Errors
Journal of Computational Vision and Imaging Systems; **D. Szczecina**[*], N. Pellegrino[*], P. Fieguth
Published at JCVIS 2024; **Best AI Paper award** Dec 2024

Education

University of Waterloo
MASc Systems Design Engineering (2025 – Present)
BASc Mechatronics Engineering, (2021 – 2026)
Relevant Courses
Data Structures and Algorithms
Deep Learning

Technical Skills

Programming: Python, C, C++, Java, C#, SQL, MATLAB, JavaScript, HTML, CSS, .Net, OpenCV, PyTorch, TensorFlow, Docker, React, Git, Linux

Design: Solidworks, AutoCAD, 3D Printing, PCB design, Microsoft Office, VBA, Power BI