David Szczecina

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Experience

Machine Learning Engineer, *Northern Digital Inc.*   Jan 2025 – April 2025
- Developed a 6-DoF Pose Estimation system using Computer Vision and Deep Learning for precise 3D tracking
- Designed synthetic datasets using Gaussian Splatting and Neural Radiance Fields to improve 3D model training
- Optimized feature extraction using Neural Networks and PCA to enhance feature detection in medical imaging

Machine Learning Researcher, *Vision and Image Processing Lab*   Sept 2023 – Current
- Published award winning AI research paper at Conference of Vision and Intelligent Systems (CVIS 2024)
- Developed 2 new Loss Functions that are robust to label error, increasing label error detection rates
- Performed analysis of the effect of mislabeled data on accuracy and loss in common ML datasets
- Increased Deep Learning model accuracy using Confident Learning for error detection in datasets

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 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 a manual process
- 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

Product Manager, *Zenduit*   May 2022 – Aug 2022
- Integrated IoT devices using custom firmware and drivers in C with I2C to collect and transmit telematics data
- Increased tracking accuracy and efficiency by implementing Kalman filters for real-time data systems

Publications

David Szczecina[*], Nicholas Pellegrino[*], Paul Fieguth, **"Loss Functions Robust to the Presence of Label Errors"** **Journal of Computational Vision and Imaging Systems**

Published at *CVIS 2024* (peer-reviewed). Received the **"Best AI Paper"** award.   Dec 2025

Projects

ML Lead - Copyright Detection in LLM Models, Wat.ai   May 2024 – Current
- Lead the development of a copyright tool to detect the use of copyrighted content in the training data of LLMs
- Optimized a data pipeline to minimize LLM API calls and processing overhead while preserving performance
- Designed an open-source RAG-based logging system to track copyright flagged media found in training datasets

Education

University of Waterloo,
Mechatronics Engineering, (2021 – Present)

Relevant Courses
Data Structures and Algorithms
Introduction to Pattern Recognition

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