MICHAEL LILLEY

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EMPLOYMENT

- **USS Vision, Inc**; *Machine Vision Engineer — Livonia, MI, USA*
  Dates of Employment: September 2021 - Present
  - Create bespoke real-time machine vision software in Python and C++ deployed on Linux devices for automatic defect detection during various manufacturing processes.
    - Led the software development of a system that visually inspects for various types of defects in sheet metal panels. This system was installed on press lines at three factories that each belong to major automotive OEMs, with defect outflow being reduced dramatically each time.
    - Led the software development of a real-time quality checking system for laser-engraved vehicle headlamps; defect detection performance exceeded 99%.
    - Participated in the creation of custom software for Matrox Iris GTX cameras, adding the capability to load in arbitrary custom ONNX model files to use for inference.
  - Create custom machine learning architectures centered on high-performance, both in accuracy and speed.
  - Use Docker and Kubernetes for container orchistration, as well as ZeroMQ for inter-process and distributed communication.
  - Parallelize data pipelines across many CPU cores and high-bandwidth distributed systems, as well as deploy on Nvidia hardware for accelerated processing capabilities.
  - Deploy and manage SQL databases and web servers for KPI records.
  - Interface with industrial hardware such as GigE cameras and programmable logic controllers.
  - Serve as a technical contact for clients.
- **University of Michigan - Dearborn**; *Research Assistant* (1), *Tutor* (2) — *Dearborn, MI, USA*
  Dates of Employment: October 2020 - December 2022 (1), *March 2018 - April 2021* (2)
  - Led a project which studied the application of concepts from computational topology to the problem of facial region segmentation, with our results later being published in IEEE ISM 2022; gave a talk at the conference. (1)
  - Used US congressional voting records to study graphical games in the context of game theory. Constructed and ran experiments to determine overall model fitness, analyzed the effects that pruning certain inputs had on the model, and determined if the behavior of an agent was better described by one model or another. (1)
  - Regularly met with other students to assist them with coursework. Tutored up to 400-level mathematics and computer science courses, as well as introductory physics. (2)
- **Woolf Aircraft Products, Inc**; *Mechanical Drafter (Internship) — Romulus, MI, USA*
  Dates of Employment: May 2017 - August 2017
  - Detailed tubing layouts in AutoCAD and Autodesk Inventor.
  - Inspected and pressure-tested components after being fabricated.
- **EnviroSolutions, Inc**; *Civil Drafter (Year Long Co-Op) — Westland, MI, USA*
  Dates of Employment: June 2016 - May 2017
  - Detailed analytical maps in AutoCAD to convey contamination in the groundwater and soil of Superfund sites.

EDUCATION

- **University of Michigan - Dearborn** — *Dearborn, MI, USA*
  Dates of Attendance: September 2017 - August 2021
  Majors: B.Sc. Computer Science and B.Sc. CIS Mathematics - Dual Degree — *GPA*: 3.56 | *Major GPA*: 3.67
  - **Mathematics**: Calculus I-III, Differential Equations, Introduction to Mathematical Proofs, Introduction to Linear Algebra, Advanced Linear Algebra, Number Theory, Cryptography, Abstract Algebra, Probability and Statistics, Topology, Numerical Analysis, Real Analysis, Differential Geometry, Algebraic Geometry

- **Computer Science**: Computer Science I & II, Software Engineering, Data Structures and Algorithms, Algorithm Analysis and Design, Artificial Intelligence, Computational Learning, Computer Organization and Assembly Language, Natural Language Processing, Web Technology, Operating Systems, Computer Networking, Computer Vision, Java Programming, Discrete Structures I & II

PUBLICATIONS

- M. Lilley, K. Das, K. Riani and M. Abouelenien, "A Topological Approach for Facial Region Segmentation in Thermal Images," 2022 IEEE International Symposium on Multimedia (ISM), Italy, 2022, pp. 189-193, doi: 10.1109/ISM55400.2022.00042.

CERTIFICATIONS

- A3 Automate - AIA Certified Vision Professional: Advanced (Granted in September 2022)

EXPERIENCE

- **Programming Languages:** Python, C++, C, SQL, HTML/CSS, JavaScript, Markdown, Prolog
- **Software**: Linux, OpenCV, Open3D, Scikit-Image, PyTorch, TensorFlow, Anomalib, Nvidia TensorRT, Kubernetes, Flask, Hugo, Scikit-Learn, ONNX, NLTK, SpaCy, ZeroMQ, Apache Kafka, Jupyter Notebooks, Docker, Podman
- **Methods**: Neural Networks, Decision Trees, Regression Analysis, Ensemble Learning, Clustering Algorithms, Anomaly Detection, 3D Point Cloud Analysis, SIFT/SURF/ORB, Fourier Analysis, Contour and Edge Detection, Blob Analysis, Homography, Hough Transform, Embeddings, Parallel Processing, Distributed Systems, Real-Time Computing