

Jacob Dreyer

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Education

Bachelor of Engineering Science in Software Engineering, Western University Expected April 2026

- **Related Coursework:** Software Testing, Cloud Computing, Networking, Embedded Systems, Computer Graphics, Circuits, Microprocessors, Project Management, Web Technologies, Operating Systems
- **Dean's Honor List:** Year 2 & 3

Experience

Automation Engineer Intern, Umicore - Burlington, ON May 2024 - August 2025

- Led a team of 11 in data migration and system implementation by developing Python automation scripts that reduced manual data entry by over a month.
- Designed, developed, and trained computer vision systems using C# and machine learning to accurately detect and classify diverse part types, improving identification accuracy and automation efficiency.
- Designed and implemented a hardware system that reduced daily downtime by over 4 hours by integrating an offline laser station and camera system to print and grade part codes.
- Developed a software-driven solution through the use of SQL to implement data transfer to/from the database and automated label generation and grading.
- Provided critical IT and production support under tight time constraints, ensuring minimal downtime and maintaining continuous operational flow on critical equipment.
- Engineered a complete PLC and HMI control solution for a ball mill system, coordinating equipment automation, sensor feedback, and operator interfaces to improve process reliability and control.

Health and Safety Intern, Umicore - Burlington, ON May 2023 - August 2023

- Led monthly training sessions for 150+ employees, translating safety concepts into clear, engaging presentations to drive adoption of best practices and improve organizational compliance.
- Gathered and synthesized employee feedback to inform updates to safety policies, procedures, and tools, collaborating with stakeholders to improve usability, effectiveness, and adoption.
- Developed and improved operational documentation in partnership with cross-functional teams, enhancing clarity, standardization, and knowledge transfer.

Projects

Ongoing Living and Learning Website, Ongoing Living and Learning

- Programmed and maintained an accessible website for Ongoing Living using HTML and Javascript that incorporated inclusive design principles and custom accessibility tools.
- Implemented announcements, event registration, and real-time chat functionality using the MERN stack allowing users to securely interact with the organization.
- Utilized agile principles throughout the project lifecycle, ensuring flexibility and responsiveness to changing requirements.
- Implemented secure Single Sign-On authentication using Google Identity Services streamlining user access while enhancing security, reducing account management overhead, and improving accessibility for users with varying technical abilities.
- Partnered directly with the client to gather requirements, iterate on features, and deliver an accessible web application validated through ongoing stakeholder feedback using Agile principles.

CleanWaste

- Developed and trained a multi-class image classification model using Python and Tensorflow to sort waste into compost, landfill, and recycling.

- Experimented with multiple CNN architectures and performed hyperparameter tuning to achieve a 80% accuracy on held-out validation data.
- Integrated model output into a real-time classification system with confidence scoring, enabling immediate feedback for users disposing of waste.

AI Powered Sustainability Report Extractor, Royal Bank of Canada

- Built an AI-driven system designed to automatically extract key sustainability and ESG metrics from complex and unorganized corporate sustainability reports, streamlining analysis and reducing manual data processing.
- Partnered with stakeholders to translate requirements into clear user stories, and designed a robust, modular system architecture supporting ingestion, processing, model inference, and structured output delivery.
- Continuously collaborated with stakeholders to understand use cases, validate requirements, and deliver a production-ready solution that met functional and integration expectations.
- Implemented an evaluation framework to programmatically benchmark multiple AI solutions, comparing accuracy, latency, and integration complexity to ensure the application fulfilled user requirements.
- Leveraged AWS and GCP cloud services, including Amazon Textract and enterprise-grade APIs, to automate document ingestion, OCR, and data extraction, integrating them into a scalable AI-driven pipeline.
- Engineered a production-ready application integrating the selected model with backend services, validation logic, and error handling, ensuring reliable end-to-end extraction and seamless client use.
- Architected a PostgreSQL database layer and chatbot-based interface enabling users to query extracted ESG metrics, while enforcing configurable rules to standardize calculation of sustainability metrics.

Automotive CAN Bus Dashboard

- Extracted and analyzed CAN bus signals from a production vehicle using an Arduino-based embedded system, translating ECU data into structured signals for dashboard visualization and system-level understanding.

Skills

Development Tools: Git, Node.js, AWS, GCP, MS SQL Server, MongoDB, Docker, Kubernetes, Azure DevOps

Languages: Java, JavaScript, TypeScript, Python, HTML, CSS, SQL, C++, C#, C, MATLAB, Assembly, VB

Libraries & Frameworks: React.js, Express.js, REST APIs, Tensorflow, ASP.NET Core, JWT, Django, GraphQL, Vite

Standards: IEC 61508, IEC 61511, ULC S524, CSA B149, Ontario Electrical Code