Alex Zhang

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EDUCATION

University of Calgary   Calgary, AB
Bachelor of Applied Science in Mechanical Engineering   *Sept. 2023 – May 2028*

EXPERIENCE

Vehicle Production Engineering Intern   Feb. 2025 – Aug. 2025
Mercedes-Benz   *Vance, AL*

- Engineered and optimized a V167 striker-liftgate alignment jig using **Siemens NX** and **Smaragd PLM** CAD data. Applied **GD&T**, tolerance stack-up analysis, and rapid prototyping to reduce tooling cost from **\$10,000** to **\$100** (99% reduction) while improving alignment performance by **15%**.
- Developed a **Python**-based statistical analysis tool to compute and **visualize Type 1 Gage Repeatability** and bias metrics, automating standard deviation, mean shift, and Cp/Cpk calculations to validate measurement capability.
- Built an interactive **PowerBI** dashboard integrating production defect data and AI fastener detection outputs to **visualize trends**, monitor KPIs, and provide structured feedback to vision system engineers.
- Led and moderated SK Rear and SK Powertrain/Chassis technical reviews, driving **cross-functional collaboration** and maintaining structured documentation for SFM platform manufacturing alignment.
- Co-developed PVC and underbody **AI vision system** use cases through industrial camera configuration and **edge device deployment**. Conducted validation testing to optimize **precision**, **recall**, and false detection rates; created **Python** scripts to **visualize detector performance trends**.
- Performed dimensional **root cause analysis** using **flushness and gap measurements**, applying structured problem-solving to implement corrective actions and document improvements for **process capability** and quality control.

Founder   Oct. 2025 – Present
Jandae   *Calgary, AB*

- Founded and **scaled** a vintage clothing brand to **five-figure revenue**, owning **end-to-end product** and **manufacturing**.
- Designed all products from **concept to production**, including **fabric selection**, **fit development**, **sampling iterations**, and **detail refinement**.
- Built and launched the brand's **e-commerce website**, optimizing **user flows**, **checkout experience**, and **conversion pathways**.

Software Development Intern   Oct. 2025 – Present
Velric AI   *New York, New york (Remote)*

- Architected mission-task infrastructure in **Supabase** using normalized **PostgreSQL** schema design, indexed **SQL** queries, and relational data modeling with secure auth integration.
- Implemented dynamic **light/dark theme** support in **Next.js (TypeScript)** using state-driven rendering, TailwindCSS theming, and component-level UI optimization.
- Integrated **OpenAI API** within **Next.js API routes** to build AI-driven mission personalization; engineered prompt pipelines, response parsing, and intent-based task generation workflows for adaptive user experiences.

Undergraduate Research Assistant   Sept. 2024 – Present
University of Calgary   *Calgary, AB*

- Developing a **machine learning forecasting model** to optimize **electricity purchasing strategies** by modeling time-series price fluctuations and demand variability.
- Validated model performance using **historical AESO market data**, applying error metrics (MAE/RMSE) and iterative hyperparameter tuning to improve prediction **accuracy** and system robustness.
- Building a **predictive decision-support system** to identify **optimal purchasing windows** from **AESO** price signals for real-time deployment.

Sales & Repair Technician   May 2024 – Aug. 2024
DECO Windshield Repair   *Calgary, AB*

- Performed high-volume **windshield repair operations** using precision **power tools**, including drills, resin injection systems, and UV curing equipment to restore structural integrity and prevent crack propagation.
- Executed hands-on fabrication and surface preparation procedures, ensuring precise chip cleaning, vacuum sealing, and controlled resin application under time-sensitive service conditions.
- Sold **2,000+** protection plans and completed **1,000+** repairs by combining technical product knowledge with performance-driven sales execution.
- Managed defect assessment, repair validation, and end-to-end customer service while consistently meeting daily operational and revenue targets.

Projects

Heat Beast Cooking Companion | *Python, Raspberry Pi*   Feb–Apr 2024
University of Calgary   *Calgary,AB*
- Designed and programmed using **Python** and **Fusion 360**, a microwave with **advanced algorithms**.
- Designed **embedded UI** using **dot-matrix**, **7-seg**, **LCD**, and **audio hardware**.

Weather House | *Python, Raspberry Pi, WeatherAPI*   Apr–May 2024
University of Calgary   *Calgary, AB*
- Developed and constructed using **Fusion 360** with **dynamic color changing capabilities**.
- Integrated a **real-time weather API system** with **LCD display**.

Technical Skills

Languages: Python, SQL (PostgreSQL), C++, C, TypeScript, JavaScript, MATLAB, DAX
Software/Tools: Siemens NX, SolidWorks, Fusion 360, AutoCAD, Smaragd, SFM, Engineering Client, Supabase, Node.js, Git/GitHub, CI/CD, Linux, SSH, REST APIs, PowerBI, Power Automate, VSCode, Jupyter
AI/ML & Data: PyTorch, TensorFlow, Pandas, NumPy, OpenCV, StatsForecast, CNN/RNN architectures, Time-Series Forecasting, Feature Engineering, Hyperparameter Tuning, Model Evaluation (MAE/RMSE), Data Visualization
Systems & Engineering: GD&T, Tolerance Stack-Up Analysis, Root Cause Analysis, Statistical Process Control (SPC), Gage R&R, Dimensional Metrology, Process Optimization, Validation Testing
Embedded & Controls: Raspberry Pi, Microcontroller Integration, Sensor Interfacing, Edge Devices, Node-RED, Serial Communication, Hardware-Software Integration
Manufacturing: CNC Milling, 3D Printing, Waterjet, Lathe, Welding, Soldering, Injection Molding, Tooling Design, Fixture Design