Landon Bakken

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Education

University of Wisconsin Madison **Sept 2024 – Present**
Bachelor in Computer Engineering, expected July 2028 *Madison, Wisconsin*

Applicable Classes: low level programming in assembly, high level programming in Java, microcontroller architecture, development on an FPGA, interfacing with microprocessors

Experience

Wisconsin Racing Formula SAE **Sept 2024 – Present**
Controls Lead *Madison, Wisconsin*
Electric Car

- Developed code for the ECU, emphasising a modular system to simplify simulation
- Developed and tuned traction control with load transfer feedforward and slip error feedback controller - reduced laptimes resulted in **2nd place Autocross**
- Developed and tuned torque vectoring based on speed and steering angle, and was well integrated with traction control. Recognized by the **Multimatic Vehicle Dynamics Award**
- Developed software in loop simulation to develop, tune, and validate traction control and torque vectoring
- Developed driver interface relating charge and distance left in endurance that was specifically recognized for **1st place in Overall Design**
- Managed multi-bus full car CAN communication system
- Developed flexable torque control system that combines driver input, control, and safety systems
- Implemented safety features such as a shutdown circuit, dyno mode, and accumulator relay

Combustion Car

- Developed systems to tune engine cylinder air to fuel ratio, resulting in a 13.2% power increase, and **3rd place in Efficiency**
- Made torque model to derive spark delay from the current RPM, throttle position, and desired torque reduction. Allows for precise and immediate torque cuts for traction control, faster pneumatic shifting, and faster throttle response, contributing to **3rd place in Overall Design**
- Developed a steering wheel with shift lights, distraction-free display, and lap timer with estimated lap times and splits

UW Makerspace **Sept 2024 – Present**
Technical Staff *Madison, WI*

- Assist students with operating tools and equipment at the UW Madison Makerspace
- Trained students on how to safely use composites room for carbon fiber work

Personal Projects

Machine Learning | *Neural Networks, Gradient Descent, Python* **Dec 2024 – Jan 2025**

- Built a machine learning model and training system from scratch using gradient descent in Python

Multiplayer Networking | *Networking, C#, Unity, Documentation* **Nov 2023 – Dec 2024**

- Developed a low-latency, peer-to-peer multiplayer system for Unity using UDP, TCP, and HTTP protocols, with comprehensive documentation for users without networking experience

3D Engine on a Calculator | *Low-level programming, Extreme Optimization* **Oct 2021 – May 2023**

- Created a 3D game engine on a TI-84+ CE using raycasting, a technique used in early DOOM games

Technical Skills

Computer Languages: Simulink, Python, C#, Java, C++, Javascript, Verilog, CSS/HTML
Manufacturing: SLA and FDM 3D printing, Laser Cutting, Soldering, CNC
Development Tools: Git, VS Code, Kvaser, Unity
3D Design: Blender, Fusion, Solidworks
Concepts: PID Controllers, CAN Protocol, Traction Systems, Signal Filtering, Networking