

# LANDON BAKKEN

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## Education

### University of Wisconsin Madison

*Bachelor in Computer Engineering, expected July 2028*

**Sept 2024 – Present**

*Madison, Wisconsin*

## Experience

### Wisconsin Racing Formula SAE

**Sept 2024 – Present**

*Controls Lead*

*Madison, WI*

Electric Car

- Developed code for the ECU, emphasising a modular system to simplify simulation
- Developed software in loop simulation to develop, tune, and validate traction control and torque vectoring
- Implemented safety features such as a shutdown circuit, dyno mode, and accumulator relay
- Developed flexible torque control system that combines driver input, control, and safety systems
- Developed and tuned traction control with load transfer based feedforward and a slip error based feedback controller
- Developed driver focused torque vectoring based on speed and steering angle inputs that is well integrated with traction control
- Managed multi-bus CAN communication by forwarding signals and optimizing the database

Combustion Car

- Developed systems to tune engine cylinder air to fuel ratio, resulting in a 13.2% power increase
- 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
- Developed a driver-focused steering wheel with shift lights, distraction-free display, and lap timer with estimated lap times and splits

Notables

- 1st place in Design, 2nd place AutoCross @ 2025 Michigan Electric
- 2025 Multimatic Vehicle Dynamics Award @ 2025 Michigan Electric
- 3rd place in Efficiency and Design @ 2025 Michigan Combustion

### 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, relying only on NumPy for optimization and GUI libraries for interface

### 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, the rendering technique used in early DOOM games

## Technical Skills

**Computer Languages:** Python, Simulink, 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:** Traction systems, PID controllers, CAN protocol, Signal filtering