Ryan Tomich

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Education

Massachusetts Institute of Technology **Sep 2023 - May 2027**
Bachelor of Science in Computer Science and Engineering; GPA: 4.8/5.0 *Cambridge MA*
Relevant Courses: ML with Light, Fundamentals of Programming, Computation Structures, Intro Program in C & Assembly, Math For Computer Science, Linear Algebra, Undergraduate Practice Opportunities Program (UPOP)

Skills

Programming Languages: Python, C/C++, RISC-V Assembly, Minispec HDL
Frameworks/Libraries: Numpy, PyTorch, TensorFlow, ONNX, Apache TVM, Hugging Face
Technical Proficiencies: Compiler Techniques, Compiler Optimizations, Transformers, Hardware Accelerators
Development Tools: Git, Data Visualization, Code Formatting Standards, Scientific Writing

Professional Experience

MIT-IBM Watson AI Lab **Jun 2025 -**
Incoming Research Intern *Cambridge MA*

MIT Research Laboratory of Electronics: Quantum Photonics & AI Group **Feb 2024 - Feb 2025**
Undergraduate Researcher *Cambridge MA*

- Built RyanTomich/LightCode : a multi-target compiler software stack to optimize autoregressive large language model inference on photonic hardware accelerators.
  - Devised a new stacked graph intermediate representation with associated path finding and scheduling algorithms.
  - Implemented arithmetic hardware architecture simulator with over 98% accuracy for LLM inference.
  - Proved theoretical 10x improvement on inference request time.
  - Worked closely with LLM transformer model architectures(GPT2, Llama-2-7b-hf)
- Created RyanTomich/np_GPT2 : a replica GPT2 and transformer architecture from the ground up using only Numpy

Town Pump **Jun 2023 - Aug 2023**
Information Technology Technician Intern *Butte MT*

- Facilitated a state-wide transition to Windows 11 and integrated phone systems by configuring, installing, and scheduling the installation of 73 computers and 100 phones and for 23 stores.

Butte School District **Aug 2021 - Aug 2022**
Information Technology Intern *Butte MT*

- Configured Wi-Fi access points and the Virtual Desktop Infrastructure (VDI) of over 1500 devices for school district of 4000 students and staff.

Leadership and Project Experience

MIT Motorsports **May 2023 - present**
Controls Software Engineer *Cambridge, MA*

- **DeCoDe LLM Benchmark**: Built a design query/CAD drawing database for a multimodal LLM benchmark, publishing DesignQA: A Multimodal Benchmark for Evaluating Large Language Models' Understanding of Engineering Documentation in the Journal of Computing and Information Science in Engineering-LLM 2024 and IDETC-Computers and Information in Engineering Conference 2024.
- **Simulation indtegration**: Wrote software to integrate control algorithms into IPGCar Digital Twin to enable testing, validation, and driver practice prior to car assembly.
- **Power Limiting**: Kept car rules compliant by create efficiency maps with torque/speed data for out power limiting strategies. Placed 1st with a perfect controls design score at Formula Hybrid Competition.
- **Launch Control**: Developed control algorithms for power limiting and torque vectoring in 4WD architecture by conducting R&D on tire slip dynamics to improve cornering speed.

Speech and Debate **Jun 2023 - Aug 2023**
Captain; policy Debate *Butte, MT*

- **Recruiting API**
  - Created a Python SQL database and algorithm to parses the full academic history of the incoming class for targeted recruiting.
- **Captain**
  - Coached/mentored 12 debaters, teaching mock debates, research/literature reviews, and argument creation.
  - Maintained a fleet of 12 laptops with custom research and brief-building software, to increase teams productivity and competitiveness.
  - Over 50 hours of competition speaking experience, Cut over 1200 pieces of evidence, Wrote 15 technical cases, contributed to 23 briefs.