Ryan T. Gordon, Ph.D.

Software Engineer | 9 YOE | Python | AI/ML | Pipelines | Backend Development
Software Engineering Portfolio Website Link: https://ryan-gordon-314159.github.io/
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Versatile software engineer with nearly 9 years of experience building pipelines for training large language models utilizing distributed computing, creating AI/ML tools, and developing backend infrastructure for the Artificial Intelligence and Quantum Computing Programs at IBM Research

Skills

Languages:	Python (primary language), Java, C++, SQL, HTML
Machine Learning:	NLPs, LLMs, Model Training, Fine Tuning, Generative AI, PyTorch, HuggingFace, Retrieval Augmented Generation (RAG), Prompt Engineering, scikit-learn
General Software:	Distributed Computing, Data Processing Pipelines, Data Engineering, PostgreSQL, S3, Ray, Spark, Lakehouse, Cloud Computing (AWS, Google, IBM), Data Analysis, Visualization Tools, Automation, Debugging, Software Test Engineering, Kubernetes, Docker, Git, GitHub, CI/CD, Data Structures, Algorithms, Linting, and more

Work Experience

Software Engineer (Research Staff Member), IBM Artificial Intelligence Program,
T. J. Watson Research Center, Yorktown Heights, NY (September 2023-March 2025)

- *Developed Pipelines on Distributed Cluster for AI Model Training*
  - Critical for making IBM's Granite 3.0 and Bamba AI models
  - Processed 100s of TB of data at-scale for 12 different languages across dozens of datasets for AI model training.
  - Pipelines ran on distributed cluster using Open Data Hub and Ray for scalable data processing and fault tolerance
  - Collaborated with Data Acquisition and Model Training Teams across IBM AI Program

- *Constructed Super-Pipelines*
  - Reduced data processing time by 50% by converting from individual pipelines to a single super-pipeline
  - Improved overall data accuracy by 10% by implementing data validation checkpoints at various points along the super-pipeline's data flow

- *Built Python SDK for IBM-Internal Retrieval Augmented Generation (RAG) System*
  - Increased performance of fine-tuned model by 10% by implementing log-prob parameter distribution analysis with generative AI system

- *Evaluated Tokenizers by Ablation Experiments*
  - Tokenizer evaluation work allowed IBM AI Program to see direct performance differences among commonly used tokenizers and rank them

- *Contributor to IBM Product for AI Model Data Preparation: data-prep-kit*
  - Contributed to lang_id transform, user experience testing, and building documentation
  - See the GitHub repository here: https://github.com/data-prep-kit

Software Engineer/Physicist (Research Staff Member), IBM Quantum Computing Program, TJ Watson Research Center, Yorktown Heights, NY (August 2016-September 2023)

- *Project Manager: Studying Two-Qubit Gate Fidelity vs Repetition Rate in Multi-Qubit Processors*
  - Measured critical parameters for calculating quantum volume, a valuable milestone in the Quantum Computing Program's roadmap. These parameters showed how much performance drop occurs when quantum circuits are run faster on these processors
  - Developed Python software for running quantum circuits, collecting two-qubit fidelity data, and analyzing it to produce data visualizations

- *Project Manager: Environmental Impact on Qubit Coherence*
  - Produced a qubit packaging where the highest T_1 time ever measured was recorded for a transom qubit. See: https://x.com/jaygambetta/status/1395347923123245056
  - Careful study looking at how environmental factors can influence qubit performance. Factors such as temperatures fluctuations, vibrations, magnetism, and radioactively were varied in a controlled way and the qubit performance impact was measured
  - Collaboration between 15 scientists and engineers for this project

- *Developing Python Automation for Single Qubit Calibration and Characterization*
  - This work led to a factor of 10 increase in qubit relaxation time
  - This automation work allowed our team to measure 100,000s of devices and gave us a fast turnaround time for trying new experiments to improve them
  - Software developer/test physicist as part of a cross-functional team to improve qubit coherence. Created software for automating qubit characterization and calibration
  - Cross-functional team collaboration between Device Fabrication and Qubit Measurement teams

Assistant Professor of Physics (Tenure-Track), Western Illinois University (August 2012-August 2016)

- *Research and teaching at both the undergraduate and graduate levels*

Postdoctoral Research Fellowship, University of Sherbrooke, Canada (May 2011-June 2012)

- *Low-temperature investigation of thermal and electrical properties of novel superconducting and magnetic materials in high magnetic fields*

Education

- **Ph.D., Physics, Iowa State University** (May 2011)
- **B.S., Double Major in Physics and Mathematics, Western Illinois University** (May 2005)

Patents, Presentations, and Publications

- 11 US patents granted
- 22 invited conference talks
- 19 contributed conference talks
- 27 accepted publications in peer-reviewed journals