

Ian Watt

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Education

- M.Eng. Electrical and Computer Engineering, McGill University** **2019**
GPA: 3.85
- B.E.Sc. Mechatronic Systems Engineering, University of Western Ontario** **2015**
Gold Medal awarded for highest GPA in program

Work History

- Senior Software Developer (Platform Lead)** **July 2022 – May 2023**
Shakudo, Inc. (Toronto-based platform-as-a-service provider for machine learning and other big-data applications)

- Expanded and enhanced Shakudo's main product, a Kubernetes-based all-in-one MLOps and DataOps platform
- Added support for Oracle OCI, Amazon AWS, and Microsoft Azure as platform backends
- Collaboratively integrated multiple open-source and proprietary tools, including Airflow, Superset, and dbt
- Wrote crypto transaction analysis code, allowing clients to easily process current and historical on-chain events
- Repaired, refactored, and optimized multiple malfunctioning codebases, including previously existing systems for crypto tracking, DNS management, database integration, and remote cluster access
- Served as the main technical contact for our largest corporate client, providing support for planning, deployment, and security certificate management

- Applied Machine Learning Scientist** **March–July 2022**
Shakudo, Inc.

- Supported clients in development, training, and deploying machine learning models
- Main application fields were extreme weather event forecasting and real-time object detection and classification
- Assisted clients with hardware selection/setup for a variety of use cases, ranging from cloud servers to mobile edge devices
- Created public-facing content to promote ML services, including tutorials on unsupervised learning and anomaly detection
- Parallelized core components of the Shakudo DataOps platform, for performance and scalability
- Automated large parts of the platform deployment process, significantly reducing setup time required for new clients
- Automated manual stages of the build/test pipeline

- Teaching Assistant** **2016–2017**
McGill University, Department of Electrical and Computer Engineering

- Supervised lab sessions, instructed students, and marked student work
- Subjects included Microprocessor Systems and Digital System Design

- Research Assistant** **Summers, 2014–2015**
University of Western Ontario, Polushin Lab

- Designed and implemented teleoperation software system for a KUKA LWR manipulator (7-DOF robot arm)
- Incorporated active compliance and haptic feedback into control loop
- 2014 work funded by Dean's Award scholarship

- Lab Assistant** **Summers, 2010–2012**
University of Western Ontario, Krishna Lab

- Automated multiple steps in lab's bioinformatics data processing pipeline
- Co-authored a research paper on plant biochemistry

- Computer Algebra Software Programmer** **2008**
University of Waterloo

- Enhanced Maple code for symbolic manipulation of special mathematical functions

Key Technical Skills

Machine Learning Techniques

Neural nets, deep reinforcement learning, transfer learning, unsupervised learning, transformers, model validation, traditional machine learning methods

Machine Learning Applications

Medical image registration, computer vision, object/activity recognition, object tracking, medical image segmentation, anomaly detection, event forecasting

Programming Languages

Python, C/C++, Lua, Typescript, Bash, misc assembly languages

Software Tools

Torch, PyTorch, TensorFlow, Git, PostgreSQL, Docker, QEMU/KVM, SolidWorks, FreeCAD, MATLAB, Unix/Linux

Infrastructure

Kubernetes, Virtual Networking, Cloud Platforms (GCP, AWS, OCI, Azure)

Robotics

Control system design, real-time systems, CAD modelling, finite element analysis, circuit design, human-machine interaction, limb control, teleoperation, haptic feedback

Project Management

Team and resource management, schedule planning, client interfacing

Publications

"Anomaly Detection: Using Machine Learning to Find Fraud", Ian Watt, Sakudo Tutorials, <https://www.shakudo.io/blog/anomaly-detection-machine-learning-for-fraud>, May 6, 2022.

"Deep Reinforcement Learning for Medical Image Registration", Ian Watt, M.Eng Thesis, McGill University, 2019.

"Metabolite profiling and expression analysis of flavonoid, vitamin C and tocopherol biosynthesis genes in the antioxidant-rich sea buckthorn (*Hippophae rhamnoides* L.)", T. Fatima, V. Kesari, I. Watt, D. Wishart, J. F. Todd, W. R. Schroeder, G. Paliyath, P. Krishna, *Phytochemistry*, 2015 Oct (118) 181-191.

Projects

Deep Reinforcement Learning for Medical Image Registration

Master's Research

2019

- Designed a deep reinforcement learning based system for non-rigid multimodal medical image registration
- Used Separation-of-Concerns techniques to simplify network such that it could fit on consumer-level GPUs
- Parallelized execution, improving hardware utilization and opening the door for multi-GPU solutions

Teleoperation of a Compliant Robotic Manipulator

2015

Undergraduate Senior Design Project

- Designed a simplified robotic manipulator as a testbed for novel compliant actuation hardware and haptic control systems
- Focus on safe human/robot interaction, even in failure scenarios
- Led team of three, managing task assignments

Autonomous Miniature Racecar

2014

UWO Engineering Club WE Bots

- With team, developed and manufactured an autonomous racing vehicle
- Robot won 3rd place in the 2014 International Autonomous Robot Racing Competition held at the University of Waterloo