Artin Molaei-Forouhar

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Education

University of Toronto   Expected: May 2026
Bachelor of Applied Science in Computer Engineering (GPA: 3.96 / 4.00)   *Toronto, Ontario*
- **Relevant Coursework:** Programming Fundamentals (C++), Linear Algebra (MATLAB), Digital Systems (Verilog), Computer Organization (Assembly), Software Communication and Design (C++), Signals and Systems (MATLAB)

Experience

Autonomous Drone Racing Team   Oct 2023 – Present
Reinforcement Learning/ Control Division   *Toronto, Ontario*
- Customized Flightmare's quadrotor simulator, tailoring it to the specific requirements of our team's training objectives using Python, C++, and Unity.
- Instrumental in crafting a dedicated testing environment using the simulator 's toolkit. Developed an advanced timer feature that precisely measures drone travel time, facilitating benchmarking against other teams' performance.
- Currently working on integrating realistic flight paths within the Unity environment by incorporating gate structures.

Robotics Team   Oct 2021 – Jun 2022
Programming Lead   *Richmond Hill, Ontario*
- Lead Java developer for the club's programming division, overseeing all aspects of the Robot's programming (ie: motor controls) while managing and supervising the programming team, ensuring effective execution of tasks.
- Self-studied the FIRST Robotics Control System and taught members Java, Visual Studio Code, and WPILib.

Projects

Digital Systems Design | *Verilog, Modelsim, FPGA, VGA, PS2*   Sep 2023 - Dec 2023
- Designed and developed a 2-part verilog game on the FPGA, consisting of 4 complex finite state machines and datapaths interlinked by a sophisticated block memory architecture.
- Successfully implemented VGA display, PS2 inputs, FPGA switches/keys/LED/HEX, enabling a smooth experience.

Deep Learning and AI | *Python, PyTorch, Matplotlib, CNNs, Transfer learning*   May 2023 - Aug 2023
- *Fruit Ripeness Detection:* Developed an image processing Python script using PyTorch to generate labeled training and testing datasets. The script incorporates advanced data augmentation techniques to counteract data insufficiency. Performed systematic tuning of hyperparameters for diverse CNN architectures, achieving an accuracy of 87%. Conducted extensive qualitative analysis using Matplotlib visualisations.
- *Hand Gesture Recognition:* Designed and implemented a high-performance CNN architecture with optimization techniques such as batch normalization, zero padding, and dropout regularization. Utilized backpropagation with a cross-entropy loss function and SGD with momentum optimizer for training. Incorporated transfer learning from the torchvision AlexNet model, surpassing 97% in testing and validation accuracy.

BioBlender | *Android Studio, Chaquopy SDK, UofTHacks X, Serp API, OpenAI, Git Version Control*   Dec 2022
- Co-built an Android app that combines traits from two input animals using algorithms involving OpenAI API, resulting in a unique creature (and description of similarity). The app then generates an image using Serp API.
- Diligently distributed tasks within the 36 hour time constraint, and synchronized progress using Git version control.

Rubik's Cube Simulator | *Java, 3D Graphics and Algorithm Implementation*   Apr 2022 - Jun 2022
- Developed a program that allows users to interact with a virtual Rubik's cube in an intricate 3D environment.
- Utilized 2D Java libraries and advanced mathematical & programming algorithms to create an immersive 3D space.

Personal Website | *JavaScript, React, CSS, HTML, Media Queries*
- Checkout my other projects and more about me here: https://artins-portfolio.netlify.app/.

Technical Skills

Languages: Java, Python, C/C++/C#, HTML/CSS/JS, Matlab, Verilog, SQL, Assembly
Technologies: React.js, PyTorch, Chaquopy SDK, MySQL, Modelsim, Quartus, FPGA, CPUlator, Unity, VS Code, Android Studio, Tensorflow, Pandas, NumPy, Matplotlib, PyGame, Pillow, WPILIB, Fusion 360
Concepts: Version Control, Deep Learning, Artificial Intelligence, Machine Learning, Neural Networks, API, Data Normalization, Agile Methodology, Mobile Development, Unit Testing