

Amrit Bhasin

a3bhasin@uwaterloo.ca | linkedin.com/in/amrit-bhasin/ | github.com/am-i-rit

Education

University of Waterloo

Bachelor of Applied Science in Electrical Engineering

Waterloo, ON

Sep. 2026 – Apr. 2031

Projects

Rash-bot: Chess Engine | C++17, SDL3, CMake

- Designed and implemented a chess engine in C++ using twelve piece-specific 64-bit bitboards, precomputed attack masks, and bitwise operations for board representation and move generation
- Developed a clock-controlled, iterative-deepening Negamax search with alpha-beta pruning, quiescence search, piece-square evaluation, and tactical move ordering
- Built an SDL3 desktop interface supporting mouse-controlled gameplay, promotion selection, board flipping, and move undo, using CMake to configure separate GUI and command-line executables

Desert Dash | Python, Pygame

- Developed a 2D endless-runner in Python/Pygame using an event-driven game loop; added dynamic difficulty through progressively faster obstacle movement and spawning
- Implemented vector-based homing projectiles by normalizing target-displacement vectors, sorting forward obstacles by distance, and assigning unique targets to prevent duplicate shots

Experience

Digital Design Team Member

UWASIC

Sep. 2026 – Present

Waterloo, ON

- Built a Verilog SPI peripheral to decode 16-bit commands and control five memory-mapped registers, using two-stage flip-flop synchronizers to reduce metastability risk across clock domains
- Developed Cocotb tests to verify SPI communication and PWM behaviour, confirming 3 kHz operation and 0%, 50%, and 100% duty cycles within $\pm 1\%$ tolerance
- Completed RTL synthesis, placement, routing, and gate-level verification, meeting a 420-cell constraint.

Private Tutor

Self-employed

May 2025 – Jun. 2026

Oakville, ON

- Built a private tutoring practice serving 10+ middle- and high-school clients, sourcing students through neighbourhood flyers and online parent groups and delivering individualized instruction in STEM subjects
- Delivered year-long individualized instruction, adapting explanations and practice sets to address knowledge gaps and build students' independent problem-solving ability

Soccer Referee

Oakville Soccer Club

May 2024 – Aug. 2026

Oakville, ON

- Officiated 70+ U8–U17 youth soccer matches as lead and assistant referee across three summer seasons, applying the Laws of the Game and resolving disputed calls under pressure
- Managed conflict resolution, player safety, match timing, and field inspections while communicating decisions clearly to players, coaches, and parents

Technical Skills

Programming Languages: C++, Python, Verilog

Tools and Libraries: Cocotb, Git, CMake, SDL3, Pygame,

Awards

- Scored in the 99th percentile on the University of Waterloo Pascal, Cayley, and Fermat Mathematics Contests
- Earned Certificates of Distinction in the University of Waterloo Euclid and Canadian Senior Mathematics Contests