Anhad Ahuja

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Engineer with hands-on experience in embedded systems, robotics, hardware-software integration, PCB bring-up, vision systems, and C/C++ development. Built custom hardware interfaces, microcontroller-based systems, and control software across academic and commercial projects. Recent graduate for Mechatronics and Computer Science.

Projects

- **Robert** — Python, OpenCV, RaspberryPi, KiCAD, Onshape

  QUT Mechatronics Design 2 robot — *2024*

  Created a robot to navigate a small warehouse roughly the size of a conference table. With an arm module, the robot would pick up and relocate items from shelves. Unique Mecanum Omni-wheel design for 4 Degrees of Freedom.

  - Programmed a navigation cycle using a custom finite state machine multi-threaded framework.
  - Designed and built all hardware from scratch including chassis, motor interface, Raspberry Pi Hat. The custom hat PCB included voltage regulators. Debugged hardware with oscilloscope.
  - Programmed Vision using Image Processing techniques, Morphology and Homography to aid navigation.

- **KeydotBoard** — Rust, Tauri, React, ESP-IDF, RFID

  2023 Arduino Hackathon — *2023-2024*

  A password inputting HID microcontroller. Manually types out a password stored on device when a linked RFID card is scanned. Custom device driver developed to interface with microcontroller program.

  - Designed and built perfboard circuit and enclosure using the ESP32-C3, MFRC522 RFID module, laser cut MDF.
  - State machine framework developed on microcontroller for device configuration modes.
  - Actor pattern used for efficient JSON relaying from the JS frontend to rust RPC to UART on the microcontroller.
  - Firmware flashing automated by device driver program.

- **Scribbly** — TypeScript, NextJS, React, Rust

  QUT 2023 Winter Hackathon winner — *2023*

  Large scale multiplayer interactive experience based on Google Quick, Draw! and room wide voting. 2 players would draw out a prompt, the room and a pretrained model would judge who won.

  - Rust websocket backend using a lightweight serialisation and transmission protocol.
  - LSTM model recursively trained by responses from players using PyTorch.

- **InfraRED** — Unity, C#, HLSL & ShaderLab

  https://buburito.itch.io/infrared — *2022*

  Made a game in Unity about LiDAR scanning in a week. Earned 4th Place globally in the Brackeys Game Jam 2022.2.

  - Using Compute Shaders, created fast and fluent base game mechanics.
  - Custom State Machine Actor framework.

Education

- **Queensland University of Technology** — Gardens Point, Brisbane, QLD
  Bachelor of Engineering (Honours) (Mechatronics) — *2025*
  - **System design and integration**: Engineering iterative design process applied in meaningful projects. Conducted Research project around LiDAR meshes. Wrote professionally formatted Engineering Reports.
  - **Control theory**: Control theory applied in complex simulations.
  - **Advanced dynamics and dynamics of machines**: Mechanisms, Kinematics and Kinetics.
  - **Electronics and PCB design** : Lower level electrical concepts. Interfacing with micro-controllers.
  - **Team oriented Design units**: 5 courses primarily focused on fulfilling difficult challenges. Included team leadership, project management, problem solving.

  Bachelor of IT (Computer Science) — *2024*
  - **Systems Programming, Algorithms and Complexity, High Performance and Parallel Computing**: Advanced programming and computer science subjects and greater understanding of Computer Science Algorithms.
  - **Agile methodologies and project management**
  - **Machine Learning and AI**: Deep Learning Neural Networks and other Machine learning models built on statistical analysis. Data pre-processing.

- **Brisbane State High School** — South Bank, QLD
  High School Education — *2017*

Experience

- **TANDM TECHNOLOGIES** — Milton, QLD (Remote)
  Developer — *2022 - 2025*
  - **3D application programming**: Programmed features for an *Autodesk Revit* plugin.
  - **WPF, C# domain-specific programming**: Created user interfaces using the MVVM-C with WPF. Also developed in house tooling, application packaging, End to End (E2E) testing frameworks.
  - **Complex, large and legacy codebase**: Worked on a large scale product with over 40 Visual Studio 'Projects' and 3 sub-repositories.
  - **Debugging and critical thinking**: Used debugging, profiling tools to optimise performance and troubleshoot and solve bugs.
  - **Machine learning based Engine**: Prototyped a Machine Learning implementation. Trained with reinforcement learning.
  - **Professional software development environment with a fast release cycle**: Worked in a team environment that required the use of standard software development practices such as version control, using markdown for documentation and following good code structuring and etiquette practices. Scrum principles were followed.

- **CANOPY TOOLS** — Strathpine, QLD
  Developer — *2019 - 2021*
  - **Automation**: Developed backend code for linking APIs, querying a database and making native calls to launch VMs on Windows Server. Strong use of critical thinking for both code generation and debugging existing applications. Tech stack included working with Node.js and C#.
  - **Azure DevOps**: Had to use several Azure products such as VMs, Serverless functions, MSSQL, Service Bus and general configuration of cloud services.

- **WINGS EDUCATION** — Fortitude Valley, QLD
  Tech Support — *2019 - 2024*
  Set up Computer Labs along with provisioning a local SMB share drive server.

Self-Improvement

- **Hackathons**: Participated and won 3 out of 10 Hackathons.
- **Website development**: Learnt to develop with web frameworks such as React, Vue, Svelte, Laravel. Developed several projects with a simple CDN Vue and Flask webserver stack.
- **Game Development**: Have developed 2D and 3D games with Unity, Godot, Love2D, Bevy, and my own game engine. Attended 9 game jams. Greatest interest in making shaders, visual effects and multiplayer networking.
- **VPS and Server Hosting**: Host my own Nginx and game server VPS along with docker processes for personal use.
- **Hackerspace**: Fond member of Brisbane Maker Space (BMS). Used laser cutter, woodworking utilities, electronics workbench on several projects.
- **3D printing**: Own and utilise a 3D printer for repair, quick one-off ideas and robots.
- **Hardware projects**: Woodworking: making tables, cabinet drawers, boxes. Repair computers and other electronics (soldering).
- **Miscellaneous**: Have made multiple scripts and projects regarding automation, IoT, or quick app ideas from friends. Visit my github at https://github.com/ProPablo/nakl to see one of them.

Skills Profile

Technologies: Linux, CUDA, OpenGL, Unity, Godot, PyTorch, TensorFlow, OpenCV, FreeRTOS, ESP-IDF, Arduino, Simulink, ASP.NET, WPF, Node.js, Flutter, Vim, Onshape, LaTeX
Languages: Rust, Python, C, C++, C#, TypeScript, HTML, CSS, F#, SQL, Java, MATLAB, PHP, Dart, Lua

References

Tyrone Nolasco:
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