

# SUYASH KHANNA

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## Experience

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### BAE Systems

February 2024 – Present

*Software Engineer*

*Adelaide, South Australia*

- Refactored internal automation tools by converting BASH scripts to Python and introducing multi-threading, reducing overall execution time by over **50–60%**.
- Investigated and profiled C++ performance bottlenecks, identifying excessive CPU usage and inefficient memory access patterns, leading to measurable reductions in system load.
- Built and documented internal REST endpoints using **FastAPI** to expose automation workflows and improve integration with downstream services.
- Researched and compared backend frameworks including **Python, Java, and FastAPI** to support architectural decisions for a new product development initiative.

### International Research Laboratory Crossing (IRL CROSSING)

March 2023 – July 2023

*AI Researcher Intern*

*Adelaide, South Australia*

- Enhanced a policy-gradient reward function design, improving learning efficiency and cooperative task performance by up to **25%** in controlled simulation environments.
- Collaborated with PhD researchers in psychology and robotics to analyse learning dynamics and emergent behaviors in human–robot, multi-agent systems.

### Welkin Web Solutions

April 2022 – July 2022

*Web Developer Intern*

*Adelaide, South Australia*

- Assisted in the development of responsive front-end interfaces using HTML5, CSS3, JavaScript, and Vue.js for both web and mobile platforms.
- Tested, debugged, and optimized front-end performance across different browsers and screen sizes .
- Designing database schema to identify potential efficiency flaws and factored in scalability.

## Education

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### University Of New South Wales

February 2026 – Present

*Bachelor of Computer Science (Honours)*

*Sydney, New South Wales*

### University Of Adelaide

March. 2021 – December 2023

*Bachelor of Computer Science*

*Adelaide, South Australia*

## Projects

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### Build Your Own Lisp (Interpreter) | *C, Lisp, Interpreters*

February 2026

- Built a small **Lisp** interpreter in **C**, implementing S-expression parsing, an `eval/apply` execution model, and a REPL for interactive development.
- Implemented language features such as lexical scoping with environments, user-defined functions (`lambda`), and key special forms such as `if` and `define`.
- Added runtime support with error handling, type checking, and a standard library of built-in functions for arithmetic and list processing.

### Space Invaders | *C++, Raylib*

August 2025

- Developed a fully functional Pong game in **C++** using the **Raylib** graphics library, implementing real-time rendering and collision detection.
- Programmed game physics including ball dynamics, paddle movement, wall collisions, and score tracking.
- Improved gameplay experience by adding keyboard controls, increasing difficulty scaling, and optimizing frame-rate performance.

### Distributed Aggregation System (Lamport Clocks) | *Java, Sockets, HTTP*

December 2023

- Built a distributed client–server system with an **Aggregation Server**, multiple **Content Servers**, and a **GETClient**, implementing HTTP-style GET/PUT request handling over TCP sockets.
- Implemented **Lamport clocks** across services, propagating logical timestamps through requests/responses and validating correctness via before/after time checks in a dedicated **test harness** (`testing.java`).
- Engineered a robust protocol behaviour with **error-code testing** (204 for empty-body PUT, 400 for invalid methods), full request/response logging for debugging, and **multi-client/multi-content-server** interaction tests to verify correct data aggregation by unique IDs.

## Technical Skills

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**Languages:** C++ 20 (fluent), Python 3.14(proficient), C 99(proficient), Java(Basic)

**Developer Tools:** VS Studio, VS Code, QT Creator, GDB

**Technologies/Frameworks:** Git, Linux, FastAPI