

# Oleksandr Nekrashevych

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🌐 [linkedin.com/in/oleksandr-nekrashevych](https://www.linkedin.com/in/oleksandr-nekrashevych) 🌐 [github.com/NekrashevychOleksandr](https://github.com/NekrashevychOleksandr) 🌐 portfolio

## Education

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### University of Pretoria

Expected Graduation: December 2026

BEng Computer Engineering

Pretoria, Gauteng

- **Relevant Coursework:** Control Systems, Signal Processing, State Estimation (KF/EKF/UKF), Machine Learning, Computer Vision, Robotics, Embedded Systems, Algorithms

## Projects

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### Facial Feature Extraction & Robotic Sketching System | Python, C, Computer Vision, Embedded Systems

- Developed an end-to-end computer vision system that extracts facial structure from images and reconstructs simplified sketches via a custom 3-axis robotic drawing platform.
- Implemented a first-principles feature extraction pipeline using Histogram of Oriented Gradients (HOG), edge detection, and spatial localization to isolate key facial regions.
- Built embedded CNC control firmware translating image-derived features into coordinate-based motion commands for automated sketch generation.

### Vision-Based Autonomous Chess Agent | Python, Computer Vision, Machine Learning, Automation

- Engineered a full perception-to-action chess system that reads a live graphical chessboard, reconstructs board state, and autonomously executes moves without API access or screen scraping.
- Developed a computer vision pipeline using OpenCV to detect the chessboard and extract piece positions, converting raw pixel data into structured FEN representations in real time.
- Integrated a CNN-based chess piece classifier (PyTorch) to improve robustness of piece recognition across varying board states and visual conditions.
- Connected a Stockfish-based decision engine to a modular architecture (vision, engine, mapping, interaction layers) and implemented OS-level input automation to execute moves via a closed-loop system.

### Multi-Colour Line-Following Robot (Robot Race Day – Semi-Finalist) | Control Systems, Embedded Systems, Signal Processing

- Developed an autonomous embedded robotics system capable of tracking multiple coloured race lines using real-time photodiode sensing and closed-loop motor control.
- Implemented low-level assembly firmware on a PIC microcontroller to enable deterministic motor actuation and real-time sensor feedback processing under constrained hardware conditions.
- Designed an analog signal processing pipeline using custom photodiode circuitry for robust multi-colour line detection without external libraries or high-level abstractions.
- Achieved reliable autonomous navigation in dynamic track conditions, securing a semi-finalist position in the 2024 TUKS Robot Race Day competition.

## Experience

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### Cheery Robot Academy | Programming & Robotics Instructor

April 2024 – Present

- Teach programming and robotics across middle school, high school, and university levels, covering software engineering fundamentals and embedded systems.
- Deliver instruction in Java, Python, and C++, alongside applied development in Roblox Studio and Godot.
- Run hands-on robotics and electronics sessions focused on microcontroller systems, sensors, and embedded systems design.
- Supervise student projects in game development, automation, and interactive systems with real-world engineering focus.

### Upwork | Freelance Software Developer

July 2024 – July 2025

- Designed 80+ SQL exercises for a PostgreSQL Udemy course used by 5,000+ learners, covering joins, indexing, constraints, subqueries, and query optimisation.
- Structured curriculum flow and refined explanations to improve clarity and accessibility for beginner to intermediate learners.
- Collaborated with the course creator to ensure instructional consistency and delivered production-ready content, achieving a 5-star rating.

**RunJumpyFly** | *Frontend & Embedded Systems Intern*

July 2024 – August 2024

- Built a responsive financial consultancy website section from Figma designs using Webflow, HTML, CSS, and JavaScript.
- Developed reusable UI components and interactive elements to improve consistency and cross-device responsiveness.
- Implemented microcontroller-based LED strip control logic enabling programmable lighting sequences for embedded systems experimentation.

**KeyStone Electronic Solutions** | *Backend Vacation Work Intern*

July 2022

- Worked on a legacy Java Spring Boot system, resolving dependency and version conflicts on modern Ubuntu environments.
- Assisted in integrating MySQL for persistent data storage and backend data retrieval.
- Containerised the application using Docker and aligned dependencies for stable and reproducible deployment.

## Certifications

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**Cisco Networking Academy**

December 2020 – January 2024

*Cisco Networking Certifications*

*Pretoria, Gauteng*

- CCNA: Introduction to Networks
- CCNA: Routing and Switching Essentials
- CCNAv7: Switching, Routing, and Wireless Essentials
- CCNAv7: Enterprise Networking, Security and Automation
- CCNP Enterprise: Core Networking

## Technical Skills

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**Languages:** Python, C, C++, Java, JavaScript, Lua, Assembly

**Technologies:** Node.js, PyTorch, Docker, Git, MySQL, PostgreSQL, MongoDB, OpenCV, MATLAB, LTspice, HTML, CSS, Webflow, Roblox Studio, Godot

**Concepts:** Software Architecture, Computer Vision, Robotics, Autonomous Systems, Control Systems, State Estimation (KF/EKF/UKF), Real-Time Systems, Signal Processing, Embedded Systems