

Numair Dubas

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Skills

Languages: C, Python, Java, Awk, HTML/CSS

Frameworks & Libraries: Tensorflow, OpenCV, Keras, SDL2

Tools: Linux, Docker, GNUMake, Autotools, Cmake, Bash, GnuPG, OpenSCAD, Godot, Blender

Projects

Rat Detector *Proof of Concept*

- Trained a custom YOLO model using Google Colab and Roboflow to detect rats in real-time.
- Leveraged the open-source deepsort algorithm to track detected rats and count their occurrences.
- Addressed data collection challenges by curating a dataset of hundreds of rat images from extracted frames of publicly-available, royalty-free video footage used to train the model.
- Developed proof-of-concept camera system intended for urban deployment to mitigate disease transmission.

Router/Server

- Saved over \$500 by building an internet router/firewall using a repurposed thin client.
- Implemented robust security measures, including key-based authentication, firewall rules, and VLANs.
- Deployed a secure Linux server with containerized applications (password manager, SMB shares, calDEV).
- Improved home network infrastructure - retrofitted CAT6 ethernet cables throughout my home's walls and deployed two wireless access points to enhance network performance and coverage.

Physics-based puzzle game

github.com/Newchair2644/The-Adventures-of-RB

- Developed a physics-based puzzle game with a unique grappling hook mechanic inspired by mechanics concepts (SHM and elastic pendulums); prototyped physics simulations using SDL2.
- Utilized the Godot game engine for development and Blender for modeling.

Void Linux Package Maintainer

<https://github.com/Newchair2644/void-packages>

- Maintained and contributed to multiple open-source packages.
- Utilized Git and GitHub for version control and collaboration.
- Overcame challenges related to dependency management and cross-compilation.

Activities & Awards

Technology Student Association, National Conference

December 2023 – April 2024

- **Biotechnology Design:** Collaborated with a five-person team in designing and developing an interactive display for a biotechnology project focused on food production. Employed an Arduino microcontroller to control buttons which represented ingredients mapped to corresponding food options. Implemented a backtracking algorithm to efficiently generate unique ingredient combinations.
- **Solar Sprint:** Achieved a finishing time which surpassed *24 of 25 teams*. Led the team in designing and prototyping multiple iterations of a solar car, including changes to gear-ratio, components, and materials used while ensuring we met deadlines and stayed within budget.
- **Tech Problem Solving:** Competed onsite against *150+ teams nationwide* in a time-limited challenge to solve an engineering problem (creating a catapult with limited tools and materials). Overcame challenges by employing innovative design techniques and strategic problem-solving.

Education

University of Pittsburgh – BS in Computer Science

Expected Graduation May 2028