

Projects & Associations

Breathing Rate Detection Using WiFi Channel State Information

2024

[IN THE PROCESS OF PUBLICATION](#)

Demo Available on Request

- Breathing rate detection using a common off the shelf intel network card.
- Achieves an accuracy of more than 98 % even in highly congested areas.
- Runs transparently and does not disrupt the normal user activity.

Linear OptoCoupler

2024

[ELECTRONICS LAB PROJECT](#)

- A highly linear, optically isolated analog voltage isolator using HCNR201.
- Achieves a maximum signal bandwidth of more than 1 MHz.
- Less than -70 dB THD at 1 KHz and full swing.
- PCB was designed using KiCAD.

RP2040 based Intel 8080 emulator

2024

[ERFAN-KHADEM/RPI8080](#)

Github

- Implemented a full-fledged Intel 8080 emulator on the Raspberry Pi Foundation's RP2040.
- The project has been used since Spring 2024 in the computer architecture laboratory for educational purposes.
- On-chip debugger, virtual input and output ports and accompanying PC software for ease of use.

Advanced Algorithms in Rust

2022

[THEALGORITHMS/RUST](#)

Github

- Implemented advanced graph algorithms such as centroid decomposition and max-flow.
- Implemented various cryptographic algorithms including Salsa20 and HMAC.
- Improved and optimized the implementation of various algorithms like SHA256 and DSU.
- Many other big and small improvements and implementation.

SSH Anti-Censorship Tool

2023

[SSH-LIBERTY-BRIDGE](#)

Github

- Implemented in go with the user management component written in python.
- Has been used successfully for bypassing GFW restrictions in Iran and bringing internet freedom to the citizens.
- Integrated in Hiddify's excellent GFW bypass solution.