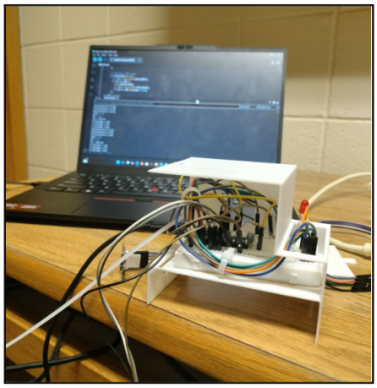
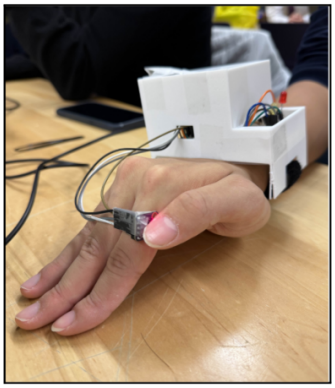
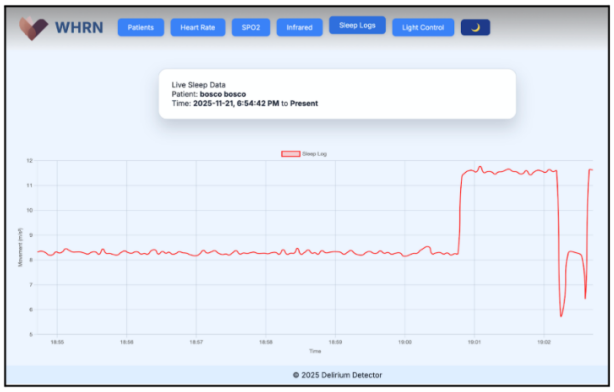
Portfolio

Hospital Delirium Detector | *HTML, CSS, JavaScript, Node.js, Express* Oct 2025 – Nov 2025

- Collaborated to build a real-time patient monitoring system with an ESP32 wearable and responsive web interface using JavaScript, Express.js, and Chart.js to visualize SpO_2, heart rate, infrared, and accelerometer signals.
- Architected a robust REST API to ingest sensor data with session-based persistence and time-series JSON storage, ensuring complete retention of both live snapshots and historical patient sessions.
- Developed a modular data model to normalize sensor inputs, calculate metrics (e.g., acceleration magnitude, response accuracy, average response times), eliminate duplicates, and maintain comprehensive historical records.
- Built a front-end dashboard with historical playback, patient session management, and control of ESP32's LEDs.



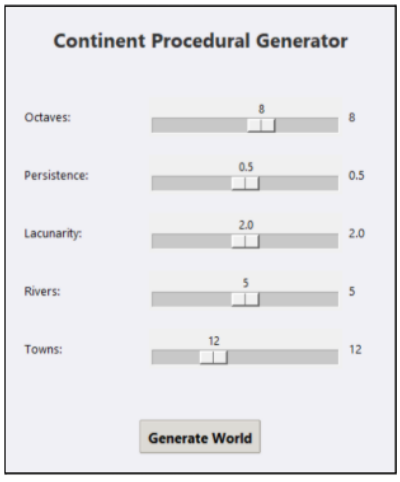


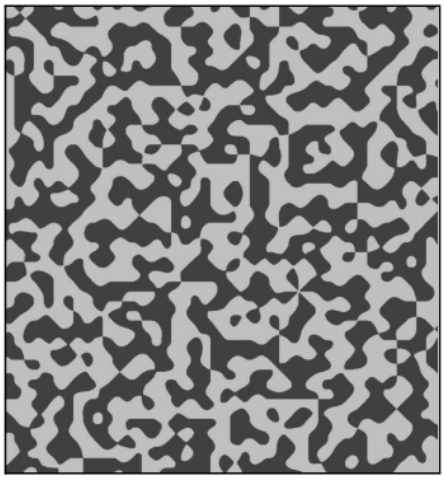


Wearable Photos Web Dashboard

Continent Procedural Generator | *Python, NumPy, Matplotlib, Tkinter* Oct 2025

- Developed a procedural continent generator with user-configurable multi-octave Simplex noise, enhanced by domain warping, radial distance falloff, and BFS-based artifact removal to produce coherent large-scale landforms.
- Designed a biome classification system by quantizing continuous elevation and moisture fields into a 2D phase space, mapping indices to categorical biomes through custom colour tables for deterministic visualization.
- Implemented hydrology using D8 flow-direction computation with slope normalization, selecting spatially separated high-elevation sources and iteratively tracing river paths to carve variable-width rivers.
- Built an automated settlement-generation module combining elevation and moisture scoring, Euclidean distance-to-water transforms, and minimum-distance constraints, integrated with syllable-based procedural naming.





Example Generation Generation GUI Simplex Noise