

# Echo Code v0.1 — Biosonar-Inspired Active Sensing

## What it is

- Mobile app + small array to emit chirps/clicks, matched-filter echoes, and map nearby obstacles.

## Core Methods

- Matched filtering/dechirp
- Doppler from spectrogram slopes
- Beamforming (small array)
- SLAM loop

## Use Cases

- Assistive mobility drills
- Indoor micro-mapping
- Low-power robot nav

## Benchmarks

- Obstacle detection time
- Mapping accuracy vs baseline (cane/LiDAR)
- Safety/comfort survey

## Ethics & Safety

- Opt-in, low SPL limits
- No data sharing by default
- Bias review for different rooms/voices