Silent Mesh

a drone-deployed fiber-optic acoustic detection system for the front line

EUDIS Defence Hackathon 2026 - Challenge 2: Next Generation Drone Detection - March 28th, 2026

Problem

Acoustic detection works.

Its communication backbone doesn't.

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Acoustic detection works. Its communication backbone doesn’t.

- Ukraine proved acoustic detection at national scale: **14,000 sensors, 95% interception rate**
- But it depends on cell towers, cellular networks, even Starlink - all jammable
- The frontline has **no infrastructure** - sometimes not even power
- As Miro told us two days ago: **1,000 Shaheds in 24 hours** - a record
- They fly really low - **radar can't detect them**
- But they are very loud. And that's good news.

Solution

Replace wireless communication with fiber.

Deploy by drone.

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Solution

Replace wireless communication with fiber. Deploy by drone.

- Same way the war evolved to use FPV drones with fiber to avoid jamming - **do the same for acoustic sensors**
- **Fiber is unjammable.** It's just physics. The speed of light through glass.
- A **€5 sensor** - just a microphone and a little laser that shoots audio down the fiber
- **Hub** = this Peli case *(POINT AT IT ON STAGE)* - receives audio from 65 sensors, AI classification, triangulation
- Sensors can be deployed **85 km into enemy territory** and send signals back at the speed of light

Demo

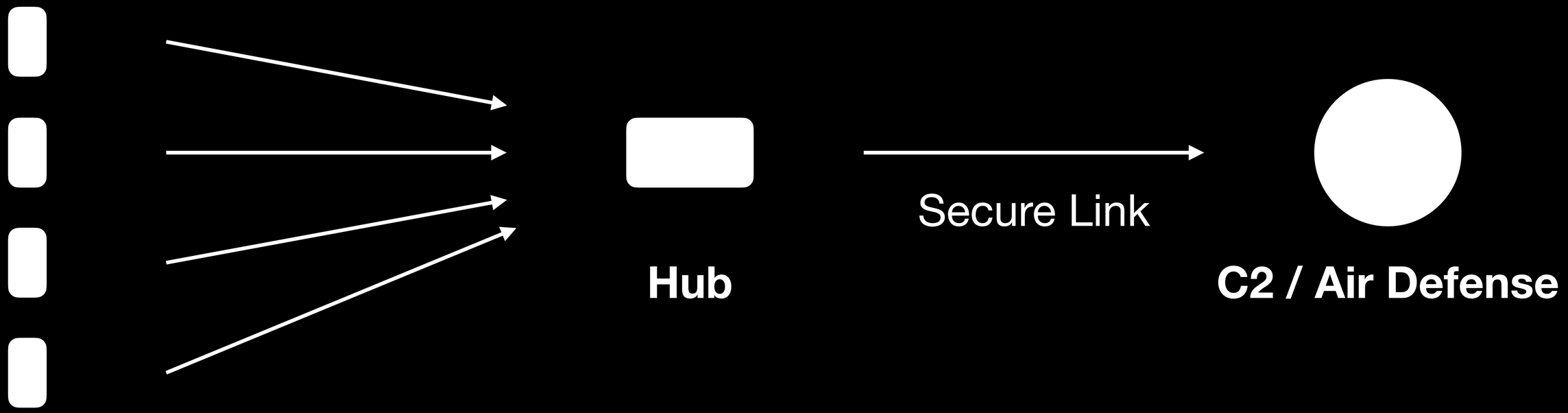
let’s hope it works =)

Technology

Architecture

Technology

Architecture



Technology

Key Numbers

Metric	Current Systems	Silent Mesh
Detection Range	300 - 500 m	1 - 2 km
Communication	Cellular (jammable)	Fiber (unjammable)
Sensor Power	15 watts (Zvook)	0.4 milliwatts
Sensor Cost	$500 (Zvook)	€5 (mass production) €50 (this prototype today)

37,500x less power

100x cheaper

Cost

100x cheaper? really?

From prototype to mass production

Cost

From prototype to mass production

Stage	Sensor Cost	What Changes
Prototype (this hackathon)	**~€50**	Off-the-shelf dev boards
Production V1	**~€21**	Discrete components, custom PCB
Mass Production	**less than €5**	Custom ASIC: mic + MCU + VCSEL on one chip

Cost

At mass production

- Standard 40km kit (26 sensors + hub): **under €3,000**
- Ukraine's full 1,200km frontline: **~€152K**
- One Patriot missile = 700,000 sensors. Enough to cover Ukraine's frontline 828 times.

That's not a military budget.
That's a rounding error.

Secret Sauce

Here’s why it can be this cheap

1. The sensor is almost nothing - by design

- A mic, a battery, and a little laser. That's it.
- The DSP algorithm on the chip decides roughly if it's hearing a drone - just basic audio processing
- Only then does it fire the laser and stream audio to the hub
- The chip can be updated with new firmware through the fiber to detect new kinds of drones
- Really low power because it doesn't need to be always on. Just listening, sleeping, and occasionally streaming.
- AA battery lasts **2 years**.

Secret Sauce

Here’s why it can be this cheap

2. The drone hides the fiber - so you don't need armored cable

- A truck drops the hub. Hub battery lasts **one month** between swaps.
- Drones deploy from the hub, dragging fiber, dropping sensors
- The drones need to be **autonomous** - they recognize terrain with computer vision to lay fiber smart
- They follow shelterbelts, hop over roads between trees (like we did here with the palm trees and the fiber around the room)
- Avoids obstacles, choke points, water
- Fiber survives up to 2 years hidden in natural cover

Team

Not too shaby

Paulo Fonseca - Designer, industrial/UX design, critical systems. System architecture, deployment simulator. Idea guy.

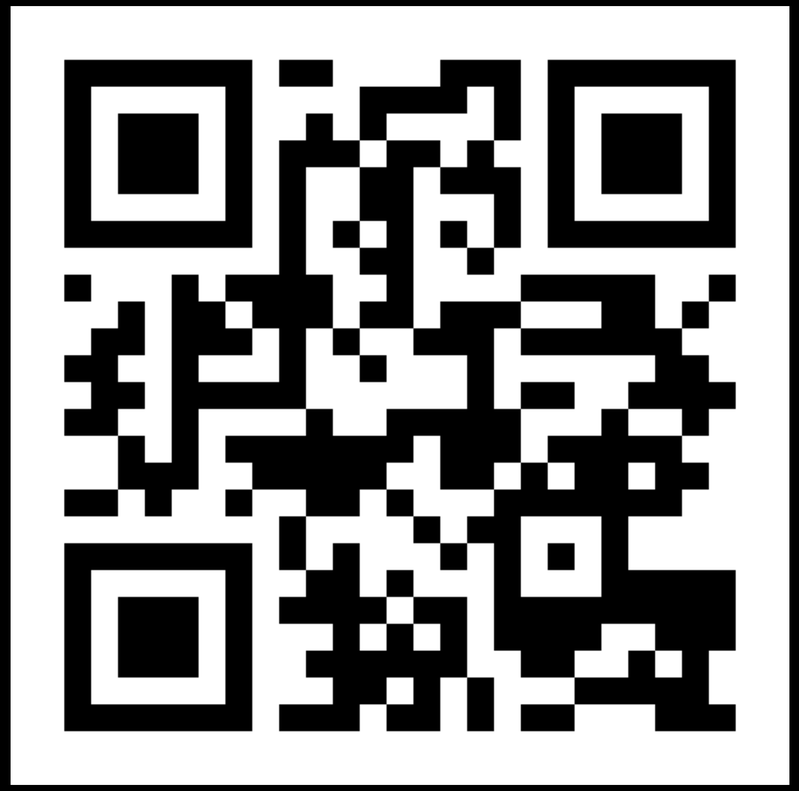
Andrei Voinea - Former firmware engineer for LiDAR sensors for Mercedes/Audi. Audio classification and DSP algorithms.

Gonçalo Fortes - Post-exit founder, sold his company to Autodesk. Built smart manufacturing software - can help mass produce this really cheap.

Ask & Next Steps

We need field testing and real data.

- We need **real acoustic data from the frontline** - Ukraine announced sharing video feeds for autonomous drones, we need the same for audio
- We're generating **synthetic data** because what's publicly available isn't good enough - that tells you something
- **UCDI** (Miro Popovic offered directly) → frontline field testing in Ukraine
- **NATO Diana** → €400K, 0% equity, Portuguese centre in Oeiras
- **Funding:** angel round soon to accelerate development
- **Goal:** TRL 5 → TRL 7 within 12 months



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