

9. Signalton & Cobalt Speech





Sound Analysing IoT Network for Smart City Sensing

R&D partnership in the Smart Cities sector

Catherine Breslin Ph.D., Machine Learning Scientist, Cobalt Speech

Nail Cadalli Ph.D., Founder, Signalton

Who we are



Catherine Breslin, Ph.D.

Sector: Audio and speech applications

Specialty: Speech processing, natural language understanding, sound analysis

Size: 20

Established: 2014, Tyngsboro, MA



Nail Cadalli, Ph.D.

Sector: Smart digital systems and applications.

Specialty: Electronics, embedded SW, algorithms, signal processing R&D.

Size: 5 (core team)

Established: 2017, Ankara

Team's experience: 120+ years



Why?

Sound Analysing IoT Network For Smart City Sensing

Advanced signal processing algorithms can reveal critical **information** in sound data.

Signalton's edge-computing platform + Cobalt's sound processing algorithms forms a **smart** IoT sensor network throughout a city.

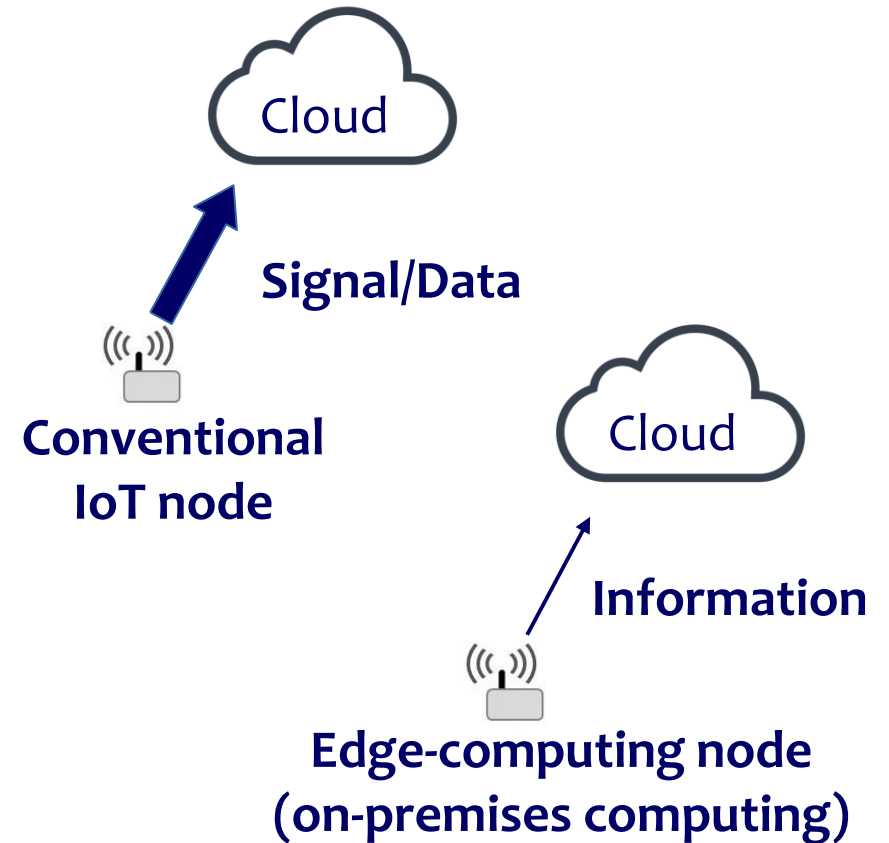
- **Sound event identification** (gunshot, scream, social disturbance, etc.), audio source tracking, and situation analysis.
- **Audio surveillance** for security via word spotting and speech recognition.
- **Traffic monitoring**, vehicle identification and tracking.



The Problem:

Complexity of sound + shortcomings of cloud computing

- Sound is a highly complex signal.
- Necessary to employ **advanced** digital signal processing techniques and algorithms to analyse sound for the targeted use cases.
- With conventional cloud computing all data is **uploaded** to cloud for analysis.
- **Privacy, bandwidth and latency** issues.



The solution:

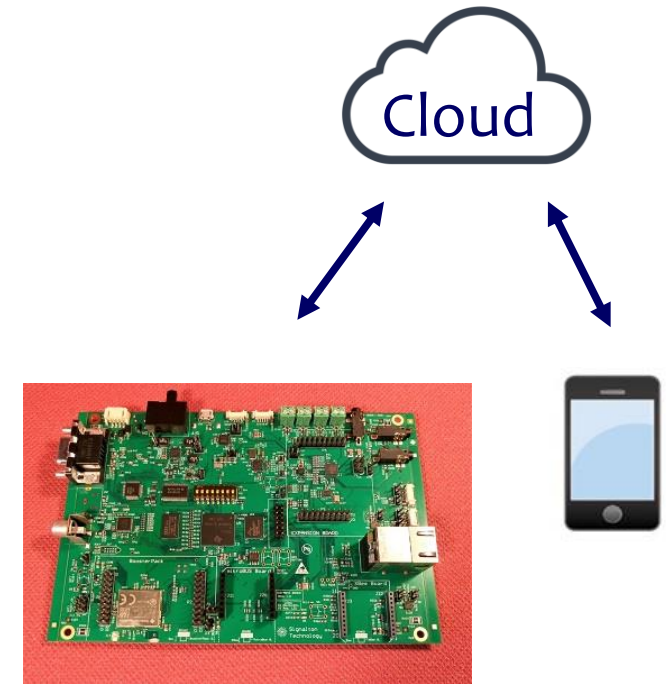
Advanced sound analysis + edge-computing IoT network

Signalton's edge-computing sensor platform **SigMote**:

- sensor data collection,
- real-time embedded signal processing,
- wireless connectivity.

Cobalt's sound analysis algorithms to be run on SigMote in real-time.

- **R&D work** includes algorithm customization for the use cases, embedded programming and system integration.
- Deployment and testing sound analysing IoT networks.



SigMote



The technology

Our **sound analysis** is based on advanced concepts of

- Machine learning and pattern recognition
- Time-frequency analysis
- Speech recognition, word spotting, speaker/gender identification
- Speech understanding (NLU)
- Sound classification



SigMote Platform: Electronics, embedded SW, algorithms.

40x powerful than a usual IoT device.

Have run ML based **audio scene classification** and **electric motor testing** algorithms in real-time.



Competitors / Competitor analysis

Audio Analytic (Cambridge): Sound event / acoustic scene recognition for smart home (glass break, car alarm, baby cry, etc.).

Sound Intelligence, CLB (Netherlands): Acoustic monitoring for healthcare, sound recognition (gunshot, car alarm, glass break, aggression).

Abilisense (Israel): Sound recognition for baby/elderly care, security, smart home.

Shotspotter (Newark, CA) : Gunshot detection, localization, analysis.

Speechmatics (Cambridge), **Trint** (London) : Speech recognition for speech-to-text.

HOW WE ARE DIFFERENT

- Use cases requiring **full-stack advanced sound processing**.
- **Product platform:** Algorithms + software + edge-computing HW + IoT network.
- Targeting smart city applications, **customizable/scalable** to other potential use cases.

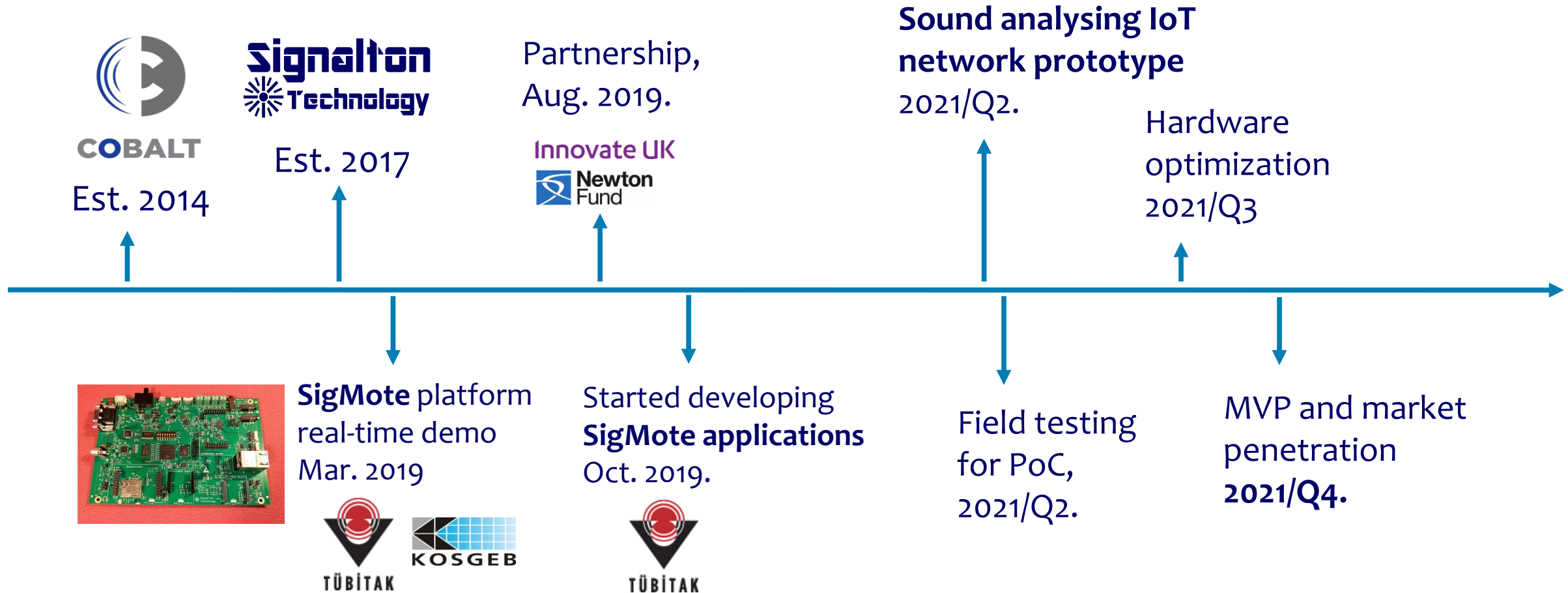


Traction or market opportunity

- **Security and traffic** authorities are potential customers, as well as **citizens**.
- **Large** sensor networks producing valuable **information** with **less cost** (than video monitoring).
- **Already** have customers interested in sound analysis applications.
- **Scalable to other sectors:**
 - Smart manufacturing (audio monitoring, preventive maintenance).
 - Healthcare (elderly/patient monitoring, audio diagnosis).
 - Security of buildings, businesses, or production plants by using smaller scale networks.



Timeline



TÜBİTAK: Scientific and Technological Research Council of Turkey
KOSGEB: SME Development Organization of Turkey



What we need

- Signalton is being funded partly by a TÜBİTAK grant and is continuing to develop SigMote platform further.
- Cobalt is a bootstrap company so far.
- We need
 - Funds to help accelerate the development - £300k.
 - Funds for the first phase of production – later stage.
 - Funds for deployment and marketing – later stage.

TÜBİTAK: Scientific and Technological Research Council of Turkey



Thank you!

Catherine Breslin, Ph.D.

Director, Solutions Architect, Speech and ML Scientist

Email: catherine@cobaltspeech.com

Phone:



Nail Cadalli, Ph.D.

Founder and managing director

Email: nail.cadalli@signalton.com.tr

Phone: +90-533-348-3873

