

MEGASENSE



MegaSense overview video

MEGASENSE



SMALL PARTICLES ARE BIG KILLERS

5.5

MILLION ANNUAL
DEATHS GLOBALLY

Air pollution is a silent and invisible killer. It causes over 5.5 million premature deaths annually. Only 1 in 10 people breathe safe air according to WHO guidelines

The smallest particles and gases are often the deadliest, and these can not be measured currently.

MEGASENSE

Patent pending



VAISALA **NOKIA**

WHAT IS MEGASENSE?

5G

Megasense is scalable and intelligent real-time air quality monitoring system that utilizes 5G network, AI and IoT.

MegaSense includes a combination of dense observation networks, high-resolution forecasts and multi-hazard AI-enabled early warning forecasting systems for outdoor air quality services.

REAL-TIME
ENVIRONMENTAL
SENSING WITH
MULTI-ACCESS
EDGE COMPUTING.

MEGASENSE

Patent pending



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MEGASENSE – HIERARCHICAL MULTIVENDOR SENSOR NETWORK

SMEAR station



- Very high accuracy
- Very high cost: >1M\$ each
- 1 or 2 in a city
- Fixed connectivity
- Ground truth for calibration

Mini-sensor



- high accuracy
- High cost: >5000\$ each
- 10 - 20 in a city
- Fixed or wireless connectivity
- Daily calibration

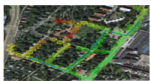
Micro-sensor



- Low accuracy
- Low cost: <200\$ each
- 100s of thousands or millions in a city
- Wireless 5G connectivity
- Hourly calibration

MEGASENSE – HIGH SPATIO-TEMPORAL ACCURACY SENSING

Geo visualization of air quality with high spatio-temporal accuracy



AI based calibration of low costs sensors based on measurements from high accuracy stations



Applications enabled by air quality sensing service



High accuracy measurements



SMEAR stations

5G enabled massive scale reporting



Mini-sensors

Calibration of low accuracy sensors



Micro-sensors

gigabytes traffic per km²

5G ENABLE MASSIVE AMOUNT OF SENSORS
AND HIGH VOLUME TRAFFIC
AI ENABLES CALIBRATION OF MICRO STATIONS
MICRO-SENSORS ENABLE ULTIMATE SPATIO-
TEMPORAL ACCURACY

MEGASENSE ENABLES NEW
APPLICATIONS AND SERVICES

MEGASENSE

Patent pending



中国移动
China Mobile



中国移动5G联合创新中心
China Mobile 5G Innovation Center



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5G Enables Air Quality Sensing in Megacities

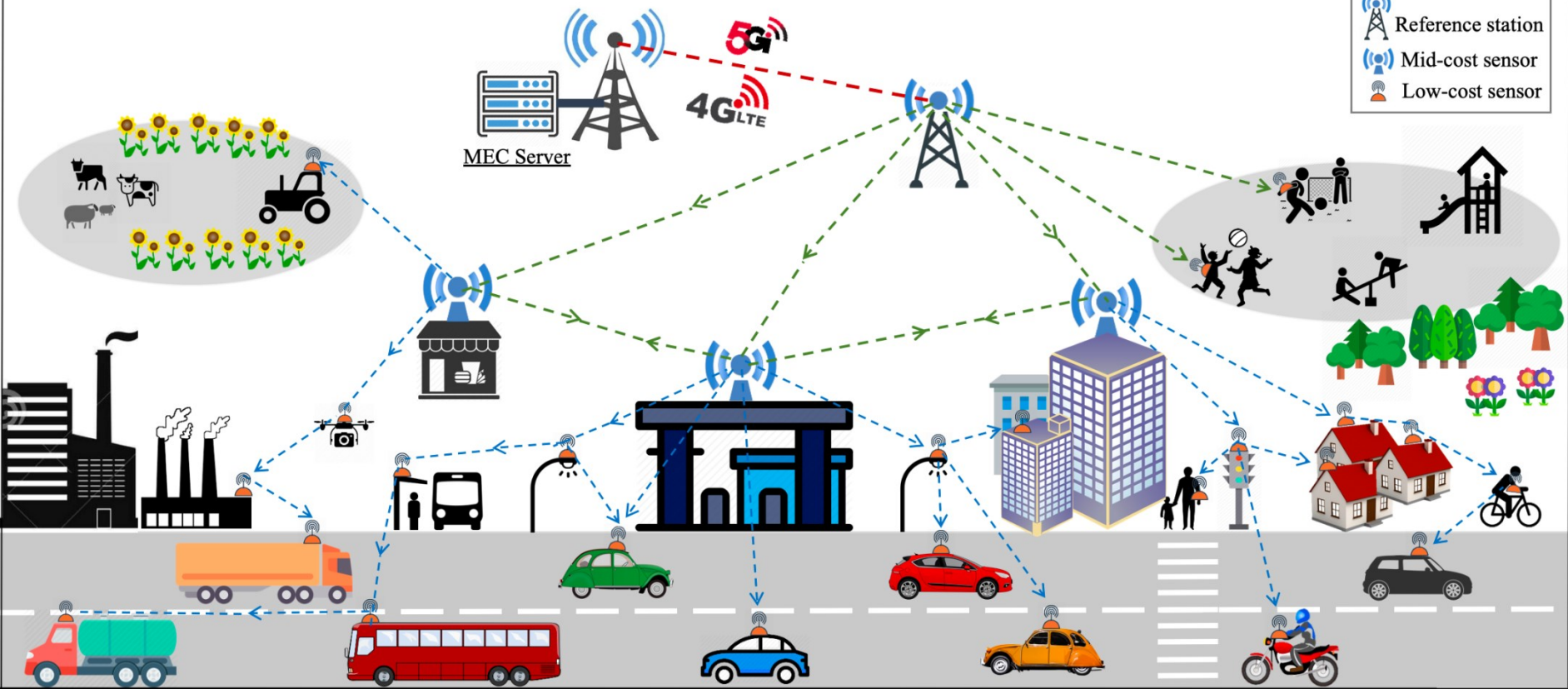
5G enablers for air quality sensing

- Improved spectrum for massive connectivity, increasing capacity, and reduced latency
- Better support for emerging edge, fog, and cloud environments
- Network slicing for better resource utilization across applications
- Network intelligence

Vision of 5G air quality sensing

- Massive amount of connected sensors
- High spatiotemporal resolution
- New business models, value chains and revenue sources; Sensing as a Service
 - Participatory sensing based on local context

-  Reference station
-  Mid-cost sensor
-  Low-cost sensor



MegaSense demo for next generation air quality monitor

Calibration of micro sensor based on high accuracy measurements and artificial intelligence

MegaSense demo for next generation air quality monitor

High resolution geo visualization of air quality measurements based on low cost sensors



WE ALL BREATHE THE SAME AIR

JOIN US IN OUR EFFORTS! LEARN MORE

CONTACT

WWW.HELSINKI.FI/MEGASENSE

IN CO-OPERATION WITH

CHINA MOBILE 5G INNOVATION CENTER / NOKIA CORPORATION / NAVINFO / ELISA /
SMEAR LTD / VAISALA / 5G TEST NETWORK IN FINLAND / CITY OF HELSINKI / FINNISH METEOROLOGICAL INSTITUTE /