



5G HEART

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APPLYING 5G AND MULTIMEDIA SERVICES TO HEALTHCARE USE CASES

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5G HEALTH AQUACULTURE AND TRANSPORT VALIDATION TRIALS

- Project overview
- 5G test facilities
- Healthcare vertical
- Remote interventional support use case
- VTT trials on educational surgery
- VTT trials roadmap





Project overview

- One of the 8 projects funded in the EC's Horizon 2020 WP for "Advanced 5G validations trials across multiple vertical industries".
- Covers services from healthcare, transport and aquaculture verticals.
- Coordinated by VTT.
- Duration: 42 months (6/2019-11/2022).
- Consortium: 22 partners from 8 countries.

Partner type	Partner	Country
Research	VTT	FI
	Marine Institute	IE
	OUS	NO
	TNO	NL
	UOS	UK
	NTUA	EL
	CEA	FR
	TUC	DE
LE	Telenor	NO
	Intracom	EL
	OTE	EL
	Ericsson	EL
	Philips	NL
	Dynniq	NL
SME	Polar	FI
	Skironis	EL
	SEALAB	NO
	WINGS	EL
	RedZinc	IE
	ACTA	EL
Other	Epitomical	UK
	OCC	UK

Pilot site:	Oslo, Norway	Surrey, UK	Athens, Greece	Oulu, Finland	Groningen, Netherlands
Verticals:	Healthcare, Aquaculture	Healthcare, Transport	Aquaculture	Healthcare, Transport	Healthcare, Transport
Test facility:	5G-VINNI (ICT-17)	5GENESIS (ICT-17)	5G EVE (ICT-17)	5GTN (national)	5Groningen (national)
5G-HEART use cases:	H1, H2, H3, A1	H3, T1, T2, T3, T4	A1	H1, T2	H1, T2
Use case categories:	eMBB, URLLC, mMTC	eMBB, URLLC, mMTC	eMBB, URLLC, mMTC	eMBB, URLLC	eMBB, URLLC
Involved partners:	Telenor	UOS	OTE, Ericsson, WINGS	VTT	TNO



Healthcare	
Use Cases	Contributors
H1: Remote interventional support eMBB URLLC	 Oslo  Oulu  Groningen
H2: Pill camera eMBB URLLC	 Surrey Concurrency Testing
H3: Vital-sign patches with advanced geolocation mMTC	Telenor, Philips, OUS, RedZinc, VTT, UOS, TNO, CEA

EXPECTED IMPACTS

- More efficient clinical processes.
- Improved patient pathways and outcomes.
- Reduced hospital OPEX.
- Reduced impact of geography and economy on the quality of health care globally.

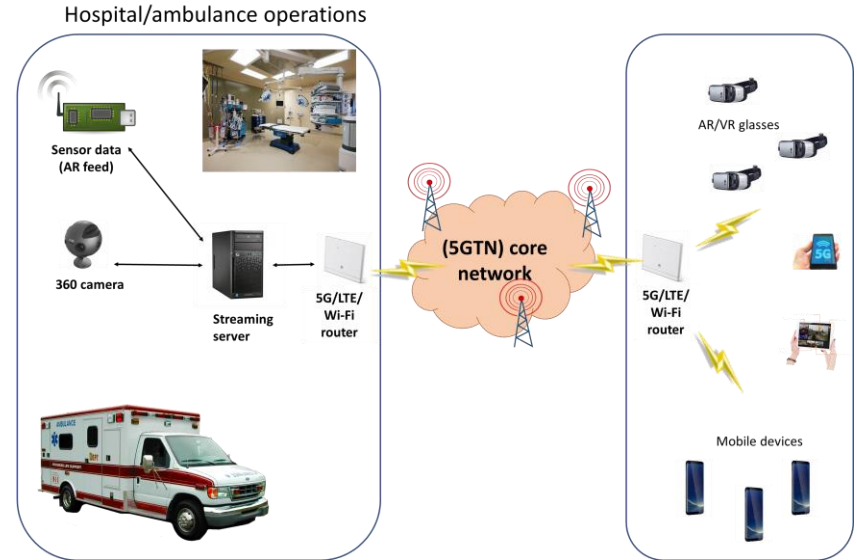
- Use case H1: Remote interventional support
 - Using remote assisted or controlled ultrasound, advanced video and augmented reality in different clinical situations.
- Use case H2: Pill camera
 - Testing real-time transmission with feedback control of a colon capsule (PillCam) to improve diagnosis.
- Use case H3: Vital-sign patches with advanced geo-location
 - Developing a prototype single-use vital-sign patch and accurate geo-location technology using current and future versions of NB-IoT and/or LTE-M.



- Remote interventional support use case focusing on the combination of 5G and multimedia services in four trial subcases.
 1. Educational surgery (Finland) combining live video streaming, IoT and augmented reality.
 2. Remote ultrasound examination (Norway) combining telepresence, virtual/augmented reality and robotics.
 3. Paramedic support (Netherlands) combining telepresence, wearable video and data transfer.
 4. Critical health event (Norway) combining interactive video and virtual/augmented reality.

- High-quality and low-latency 360° augmented reality live video streaming from hospital or ambulance to a remote location.
 - Useful, especially in the current COVID-19 situation, for educational purposes and remote monitoring.
- Trial components:
 - 5G test network in Oulu, Finland (operated by VTT)
 - User devices (laptops, tablets, smartphones, virtual/augmented reality glasses)
 - Cameras (360° cameras, wearable cameras, mobile cameras)
 - IoT sensors (providing information for augmented reality)

- Challenging requirements:
 - High throughput (4K, HDR)
 - Low latency (user interactions)
 - Mobility (ambulance)
- Trial objectives:
 - Find the limits of the current 5G technologies.
 - Optimise multimedia transfer techniques to maximise the network performance.



- Local standalone trials in Finland.
 - Full end-to-end trial setup including 5G equipment, user devices, cameras and sensors.
 - Basic trial setup deployed and validated.
 - Optimisation of video transmission and end-user service enhancements with augmented reality ongoing.
 - More information available at the project website (<https://5gheart.org/>).
- Joint trials between multiple countries.
 - Extension of the local trials performed in Finland (interoperability).
 - Trials planned for 2022.

THANK YOU FOR YOUR ATTENTION

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