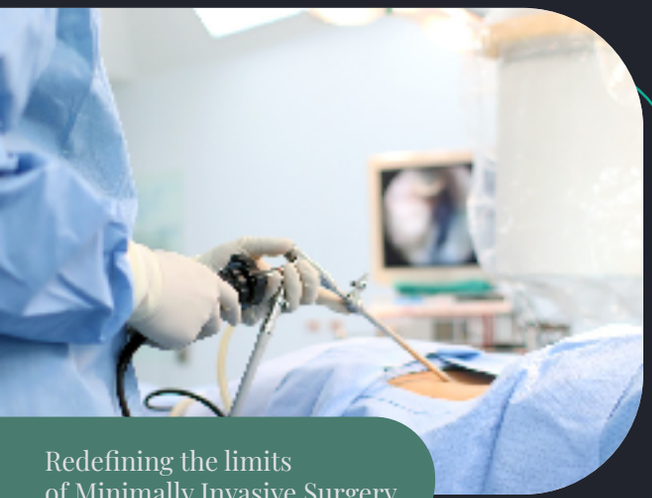
Project Mission

PALPABLE aspires to commence a new generation of palpation tools based on a synthesis of cutting-edge technologies essential for the identification and visualisation of tissue abnormalities in minimally invasive surgeries (MIS). The focus will be on developing a palpation finger-like tool with a new instrument that can acquire, process and interpret vast amounts of sensory data, enable new functionalities, and be manufactured sustainably and with reduced cost. This way, the consortium aims to further improve the current statistics regarding MIS advantages, from reduced tissue damage and blood loss during surgery to hospitalisation and decreased



Redefining the limits
of Minimally Invasive Surgery

Consortium

The PALPABLE project has been inspired and will be developed through its four-year lifetime by a transnational consortium of multiple partners. The consortium partners bring to the (surgical) table significant and diverse technological and scientific expertise on soft robotics design, continuum mechanics, non-linear pneumatic control and multiple sensing modalities, from haptic sensor and probe design to stiffness reconstruction algorithms to distance sensing modules. postoperative recovery.

Hellenic Mediterranean University

Università di Torino

European Association for Endoscopic Surgery

Medtronic

TECH HIVE LABS

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ESSEX.AI Innovation Centre | University of Essex

Queen Mary University of London

SOFRADIM Production

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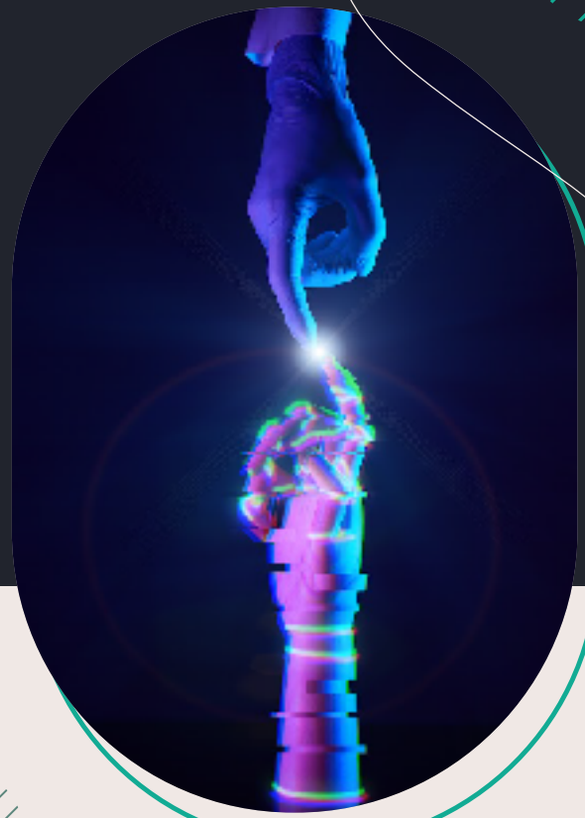
palpable



Multi-sensing tool for Minimally Invasive Surgery (MIS)

Redefining the limits of Minimally Invasive Surgery

Current Challenges

On a global level, 310 million major surgeries are performed yearly, with 20 million taking place in Europe. Over 2 million are laparoscopies, the most widespread minimally invasive surgery (MIS).

Yet, haptic, visual or tactile feedback is not always adequate during surgery. Combined with the lack of dexterity in surgical tools, operations could be time-consuming and with an increased possibility of accidental tissue damage, amongst other negative effects. So, by optimising the laparoscopic tools and processes, reduced invasiveness and operative time, as well as increased safety and functionality, could be achieved.

Therefore, a deeper dive into soft robotics could be the answer to increased safety, dexterity and potentially reduced costs. For the above reasons, there is growing interest in developing pneumatically actuated soft robots combined with multiple other technologies that can release surgeries from existing constraints.

Palpable

This project has received funding from the European Union's Horizon Europe programme under Grant Agreement N°101092518.

Technologies

- A thin, pneumatically actuated end-effector with proprioceptive sensing.
- A sensorised probe capable of distributed tactile sensing.
- A non-planar photonics circuit for haptic sensor array interrogation.
- A distance-sensing module.
- A stiffness profile reconstruction algorithm.