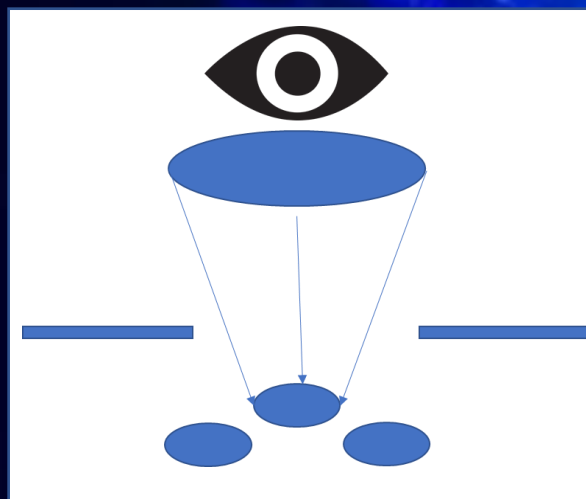




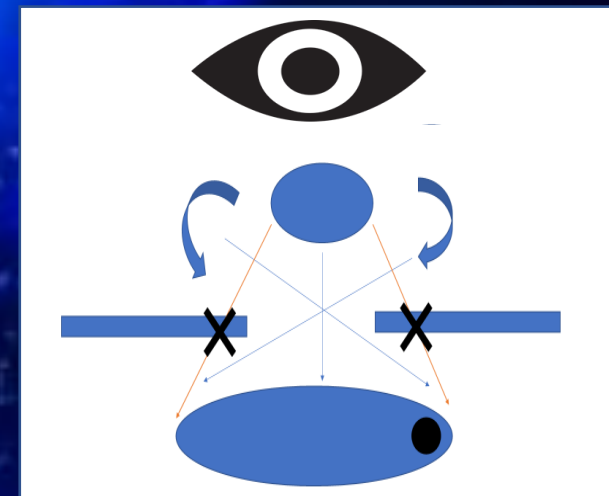
ER4Surgery team

Video processing solutions to tackle visibility problems in Minimally invasive surgery

Open surgery



Minimally-invasive surgery



Unmet need

Statistics:

- 200 M+ surgical procedures are performed each year globally.
- Despite awareness of adverse effects, surgical errors continue to occur; 4000+ surgical errors in the US annually [2015 statistics].
- Most malpractice claims in hospitals are related to surgical errors [2022 statistics].
- Medical errors account for over \$4 billion per year.



In practise

1. Surgeons must switch their gaze between screens and oculars to see all areas of the target tissue.
2. Instruments are blocking the view in narrow openings

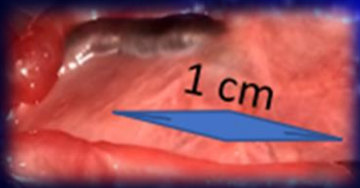


Properties of algorithms under development

1

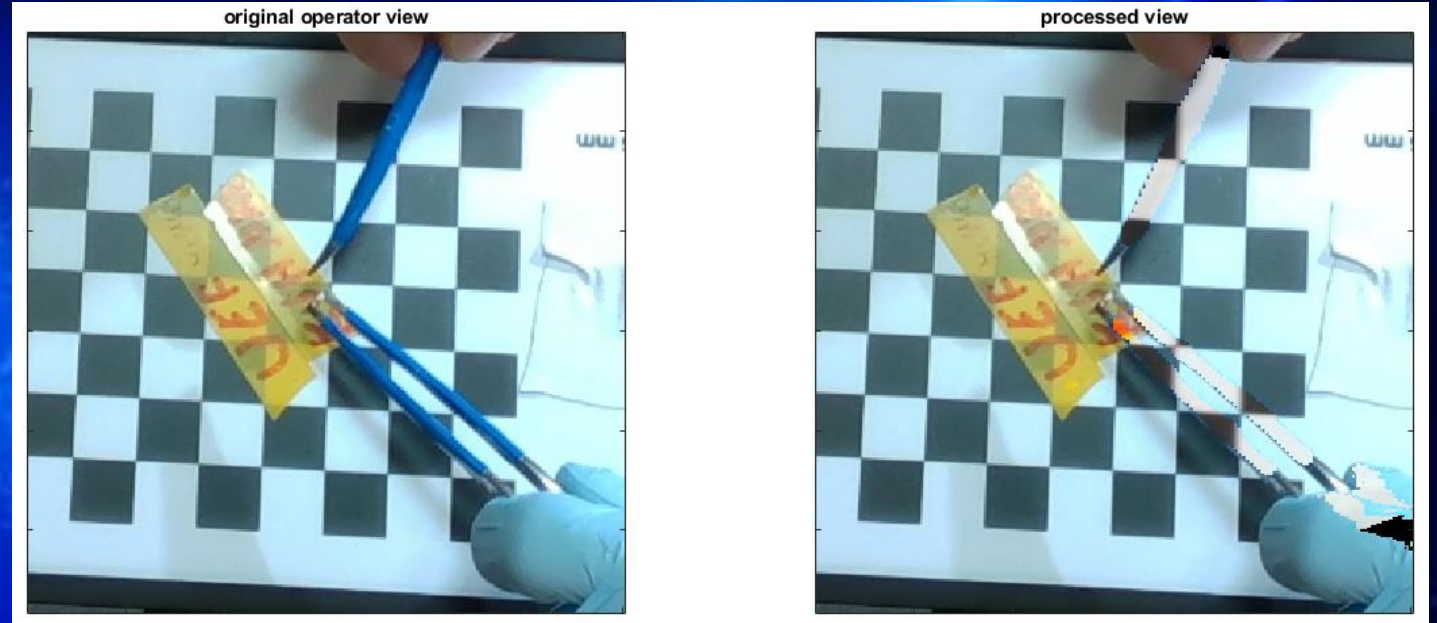
Fusing video camera feeds of different zoom level

- Ability to zoom from 1 mm level to the whole tissue in a single video feed



2

Instruments appear transparent in a single video feed



- no need for separate endoscope view

Benefits of the single video view solution

- Improves work ergonomics of surgeons
- Improves perception of target organs & surrounding tissues
 - Enables precise handling of instruments
 - Helps to avoid damage to sensitive tissues
- Helps shorten operation time
 - Boosts fast healing of the patient





KYS
MICROSURGERY
CENTER



UNIVERSITY OF
EASTERN FINLAND

SPARK
—FINLAND

Batch 2/2022



Paavo Vartiainen: PhD, Algorithm Developer, Spark Team Lead.

Ahmed Hussein: Specialist in Neurosurgery, Clin. Coordinator at Microsurgery Center of Eastern Finland.

Mastaneh Torkamani Azar: PhD in Electronics Engineering; Post Doc at AIV Institute, UEF.

Zunaira Jamil: MSc in Medical Physics, Intern, Implementation and Initial Market Search

Pasi A Karjalainen: Prof. of Signal and Image Processing, UEF.

Roman Bednarik: Assoc. Prof. of Medical Interactive Technologies, UEF.

Facilities: HUMEA Lab, UEF & Microsurgery Center (dry and wet labs), Kuopio University Hospital.

Next step: Pre-seed funding: Business Finland Research to Business will be applied March 2023

sites.uef.fi/humea/ER4Surgery