

HUMEA Lab & Interactive
Technologies Group

ER4Surgery

Expanded Reality for Image-Guided and Minimally-Invasive Surgery



Minimally Invasive Surgery (MIS) is becoming a preferred choice of surgeons in many surgical specialties. Still, MIS has posed significant challenges in terms of narrow surgical corridors and depth perception of anatomic structures. Using the high magnification features of surgical devices and existence of surgical instruments in the surgical view exacerbate these challenges and result in highly restricted surgical views for surgeons.

Our team is developing **ER4Surgery**, a software solution powered by processing multiple video feeds of surgical scenes with a custom algorithm pipeline. Our goal is to provide an **Expanded Reality (ER)** capability for the whole **surgical field** through which surgeons could work over the areas of interest with a high zoom function and simultaneous visualization of the adjacent structures.

COMPETITIVE ADVANTAGES

- Expansion of surgical field of view in image-guided, minimally invasive surgery without causing interruptions in the workflow
- Automated calibration in response to varying angles and alignments of the operator camera
- Real-time video mosaicking and image distortion management
- Optimal solution for a variety of surgical specialties across primary to tertiary care, including neurosurgery, ENT, ophthalmology, orthopedic, gastroenterology, gynecology, and plastic surgery

IPR STATUS

- Invention disclosure filed with UEF and KUH (Summer 2022)

SEARCHING FOR

- Mentoring for presenting benefits of the solution to different stakeholders
- Collaborations for feasibility studies with potential end users in hospitals and clinics
- Inputs from industrial partners to push our invention towards commercialization
- Partnerships with manufacturers of surgical microscopes and other image-guided operating devices, intra-operative navigation software, digital surgical platforms, and computer-assisted surgery

sites.uef.fi/humea/ER4Surgery

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