

STRATUM: 3D Decision Support Tool for Brain Tumor Surgery

Description

Integrated digital diagnostics can support complex surgeries in many anatomies where brain tumour surgery is one of the most complex cases. Neurosurgeons face several challenges during brain tumour surgeries, such as critical tissue and brain tumour margins differentiation or the interpretation of large amount of data available provided by several independent devices. To overcome these challenges, STRATUM will develop a 3D Decision Support Tool for brain surgery guidance and diagnostics (reaching TRL7) based on multimodal data processing through Artificial Intelligence (AI) algorithms that will be integrated as an energy-efficient Point-of-Care computing tool.

It will be developed following a co-creation methodology involving key stakeholders and end-users.

STRATUM will pursue the following objectives:

- To foster advances in personalized medicine based on multimodal data (including the emerging hyperspectral imaging modality) and AI.
- To increase the intraoperative diagnostic accuracy of brain tumours, improving surgical outcomes and patients quality of life.
- To reduce surgery time with respect to current neurosurgical operation durations.
- To improve current cost- and energy-efficiency of neurosurgical workflows.
- To demonstrate the prototype in a two-year clinical study in 3 clinical sites, including an early health technology assessment.
- To prepare the preliminary business plan and the TRL9 roadmap after the project ending.

An optimized integration and processing of available and new emerging data sources would aid surgeons in timely efficient and correct decision-making in tissue removal. This would maximize the degree of resection while simultaneously minimize the risk of neurological deficits. Moreover, time efficient surgical procedures not only benefit the patients directly by minimizing anaesthesia time and risks of e.g. postoperative infections, but also indirectly by optimizing resources of the health care system.

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