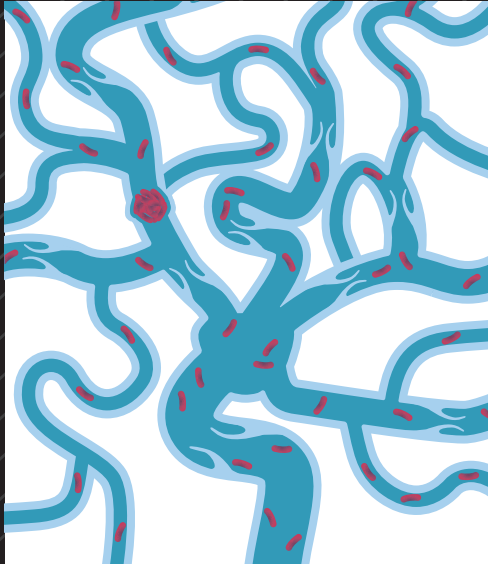


MAGNETIC TENTACLES

Fully shape forming soft magnetic robots to allow safe access deep inside the brain.

1

REQUIRED PATHWAY EXTRACTION FROM ANATOMY



A desired target region (e.g. brain lesion) and entry point are identified using pre-operative imaging, and a patient-specific pathway is automatically generated representing the optimal route to reach the target.

2

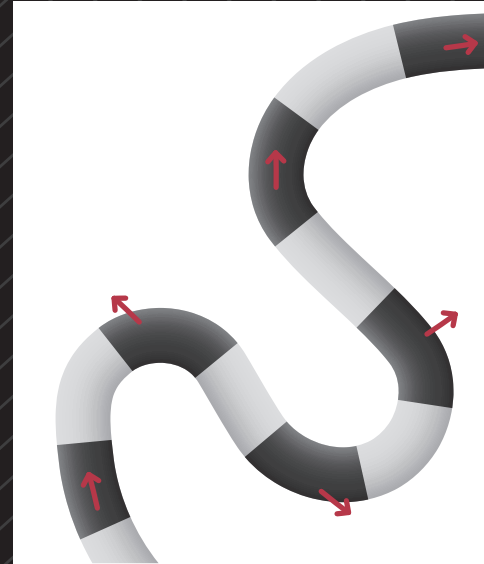
DESIGN OPTIMISATION / SIMULATION



Using the desired pathway, shape modelling is performed using artificial intelligence to determine the optimal 'magnetic signature' for the tentacle design. Software based simulations are employed to predict the tentacle's behaviour during the procedure.

3

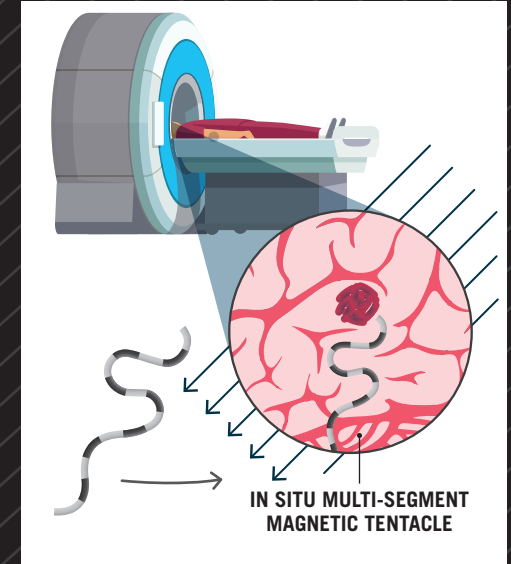
AUTOMATED, PATIENT-SPECIFIC FABRICATION



The final design is produced through rapid automated fabrication to deliver a mm-scale, ultra-soft and flexible tentacle with a patient-specific magnetic signature.

4

IMPLEMENTATION UNDER ROBOTIC, CLOSED-LOOP CONTROL



With the patient placed inside a controllable magnetic field (e.g. an MRI machine), the shape and trajectory of the tentacle are manipulated by the surgeon to safely manoeuvre it towards the target lesion where localised therapy is performed.



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