

MASTER'S PROJECT INVITATION

SUPERVISORS: T. L. THOMAS & PROF. S. MISRA

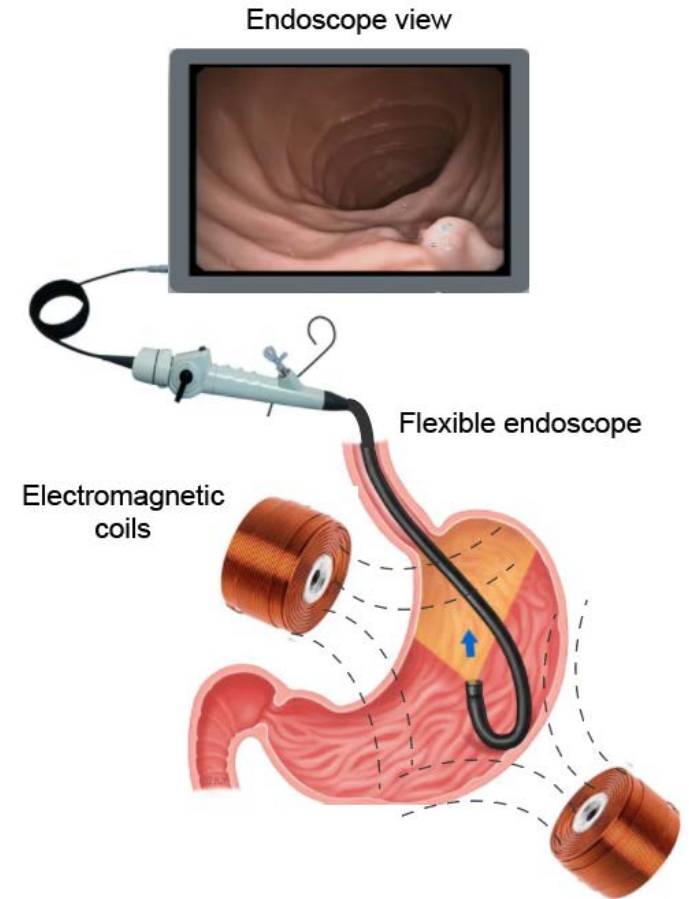
Project title: Design of a magnetically-actuated flexible endoscope for retroflexion.

Background: Retroflexion refers to the maneuvering of the endoscope to rotate backwards for an improved visualization of portions of the organs, that will otherwise not be seen by a forward-viewing endoscope. Retroflexion is crucial for a comprehensive endoscopy exam to detect and remove polyps that are difficult-to-access. This project aims to design a flexible endoscope with compliant continuum structure that enhances its reachability and steerability within the human body. Retroflexion will be demonstrated using an untethered system of magnetic actuation.

Tasks:

- Literature review on flexible endoscopes and continuum robots used in surgery.
- Investigate variable stiffness designs for the endoscope and suitable actuation methods like magnetic fields.
- Design and simulate a novel design of the flexible endoscope with variable range of motion and reach.
- Fabricate a prototype and demonstrate retroflexion in benchtop experiments.

Suited for: BME, ME, S&C.



Retroflexion of an endoscope inside the stomach.

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