



Natural Orifice Surgery

Telesurgery

M.C.J. Franken MSc.

Supervisors:

Prof. dr. ir. S. Stramigioli

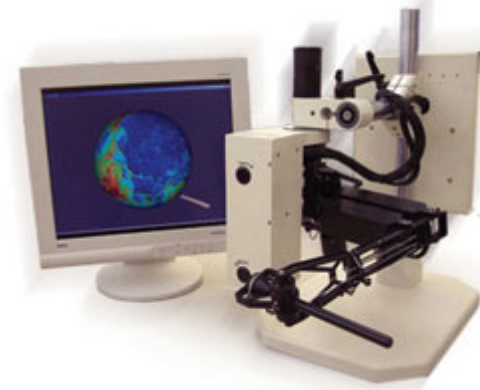
Dr. I. Broeders

Content

- Technical Medicine at University of Twente
- Natural Orifice Surgery
- PhD project
- Technical challenges

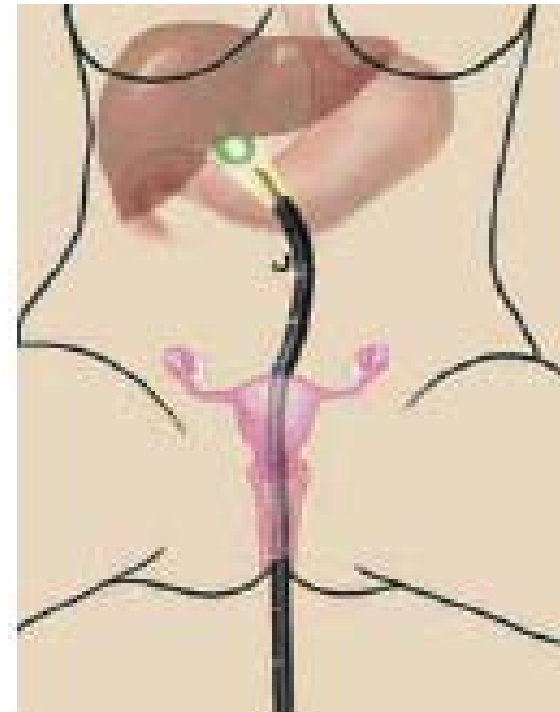
Technical Medicine at University of Twente

- Started at University of Twente in 2002
- Produce hybrid medical/technical researcher
- Understanding of technology itself and how to apply it in practice
- Skills lab



Natural Orifice Surgery

- Operate through the natural openings of the human body:
 - transgastric
 - transdougla
 - transcolon



Natural Orifice Surgery

- Expected decrease of recovery time -> reduction in costs of hospital stay
- No risk of intra-operative infection with external bacteria
- No cosmetic damage

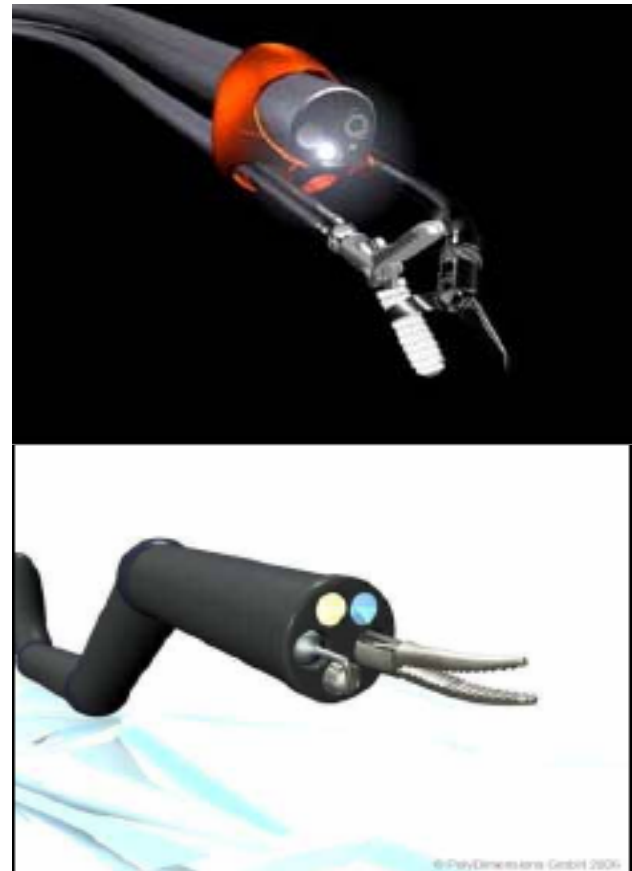


PhD Project

- Design of a master-slave setup with which the surgeon can perform surgeries through the natural openings of the human body.
- Improve the immersion of the surgeon in the operation scene by means of haptic feedback.

Technical challenges

- Development of master – slave setup
 - Number of d.o.f.
 - Manipulators
 - Actuators
 - Control
- Haptic feedback
 - Sensors
 - Closed-loop stability
- Vision
 - 3D stereometry
- Disinfection of slave system



Clinical challenges

- Preventing trauma to and infection of the abdominal area by gastric acid and bacteria.
- New operation procedures
- Validation of and feedback on design



Questions?