

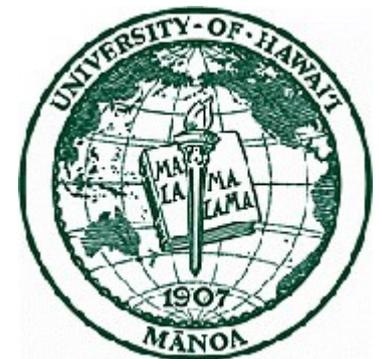
# Compact Teleoperated Robotic System for Laparoscopic Surgery

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# Another approach to minimally-invasive surgery

- Traditional minimally-invasive surgery hard for the surgeon
- Robotic assistance for surgical intervention increases quality of surgery and eases access to areas hard to reach
- However ...



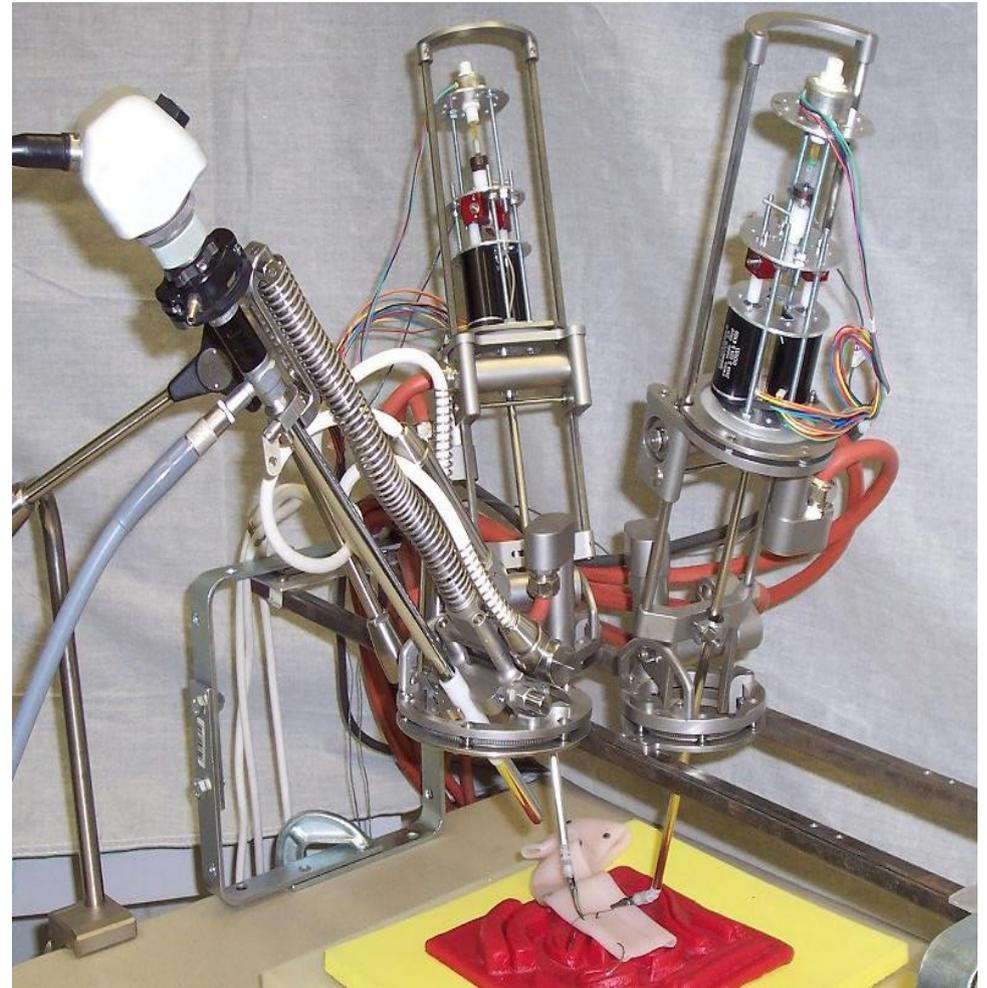
# Current Robotic Systems for MIS

- High costs
- Hard to maintain
- Complex to set up
- Large size
- Needs draping
- Takes up room above the patient:  
*most expensive piece of real estate*



# Compact Lightweight Surgical Robot

- Modular system
- Clamped onto the patient
- Fits into autoclave
- Sterilized
- Easy to set up
- Integrates within the surgical work flow
- Controlled by off the shelf master console



*(current prototype)*



# My research

- Tool tracking and image-based visual servoing using the endoscope
- Augmentation of usage of the current prototype system
  - Visual
  - Haptic
- Visual perception vs. haptic interaction – clinical evaluation, revision of haptic interface design
- Performance evaluation of clinical applications:
  - Pediatric surgery
  - Multi-quadrant surgery



# Current Challenges

- **Monocular** endoscope
  - Loss of 3D information
  - True position recovery of the instrument robots with respect to the endoscope robot hard to do
- Haptic master console
  - does not **intuitively** reflect the true 3D position of the instrument (incl. Wrist)



# MAHALO and ALOHA!

