



# Medical Robotics

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# Robot for Biopsy & more

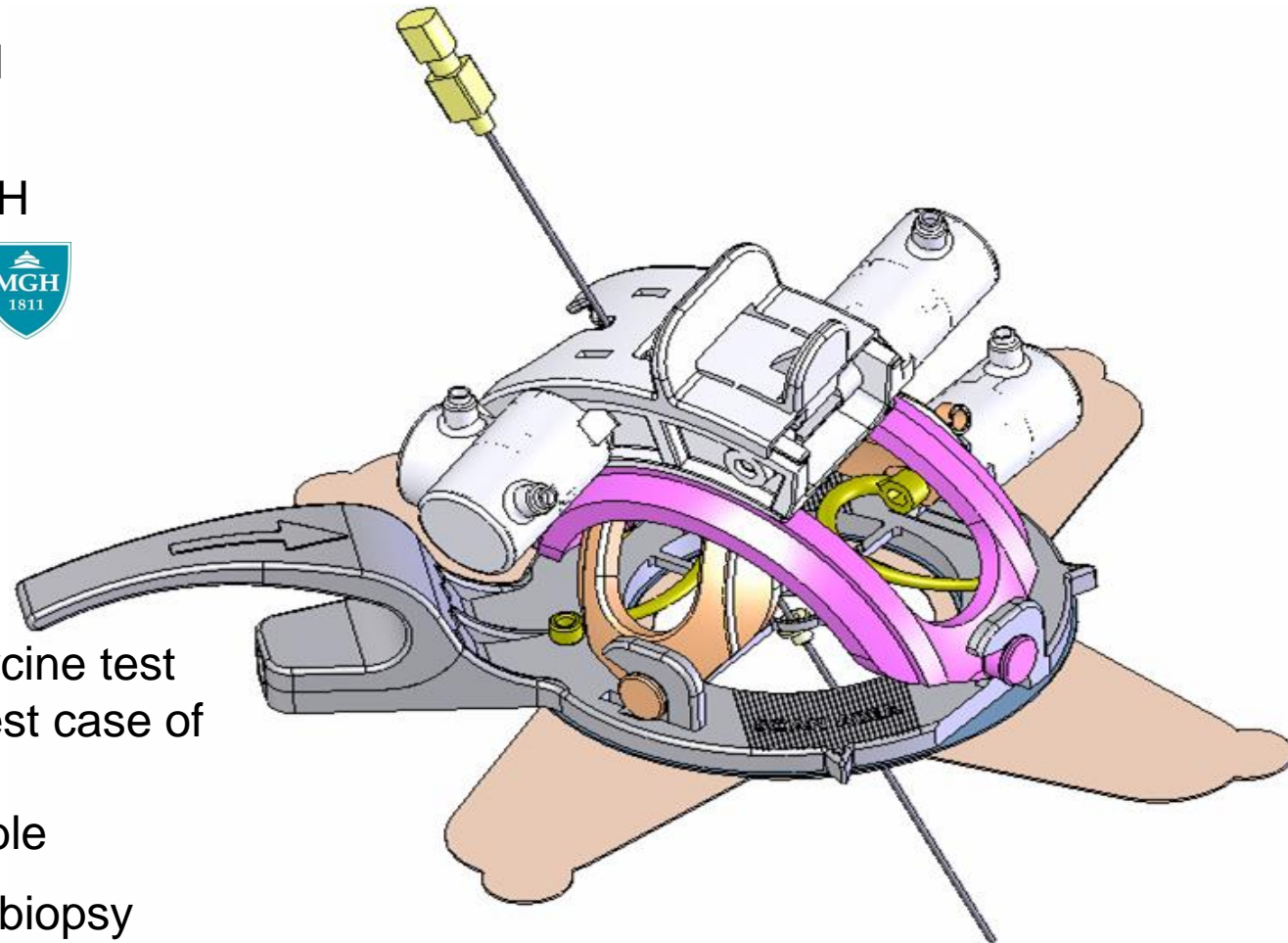
- ▶ **Improved CT guided and motorised Lung Biopsy**

Cooperation with MIT, MGH



- ▶ Function of subunit:
  - direct biopsy needle
  - drive needle in and out
  - link to CT-scan data
  - single-use device
- ▶ Meets 3.6mm target in porcine test vs. 10mm lesion size in best case of manual procedure, lesion size 1.5mm reachable
- ▶ Robopsy supported lungs biopsy needs 20 min vs. 60 to 90 min manual

<http://web.mit.edu/robopsy/>

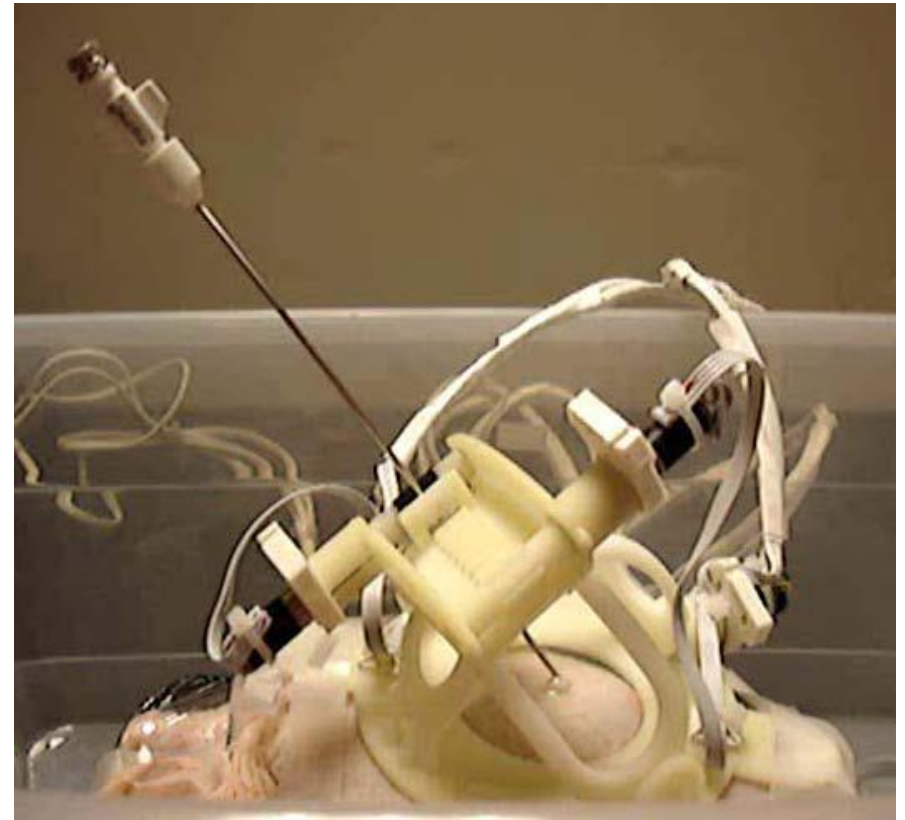
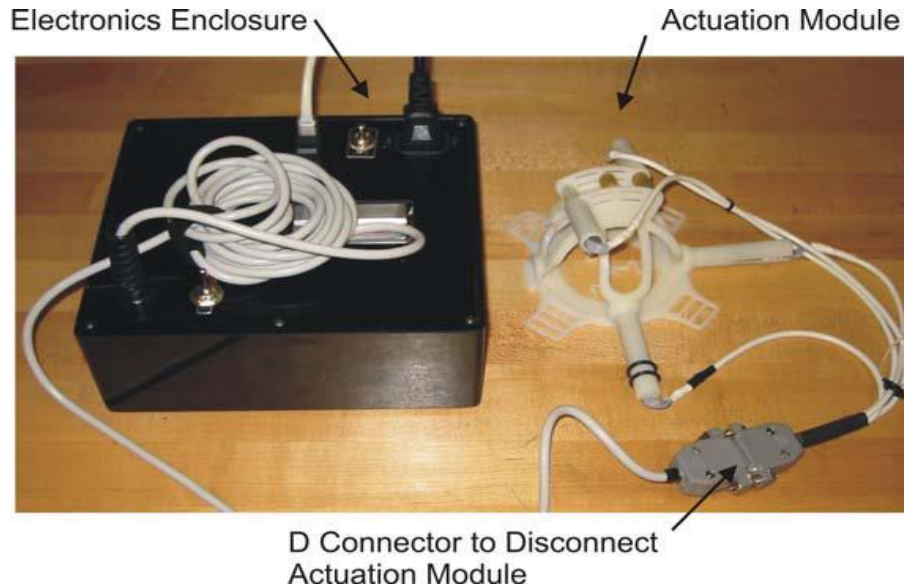


JMT engineered prototype used for porcine test

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# Robopsy concept phase

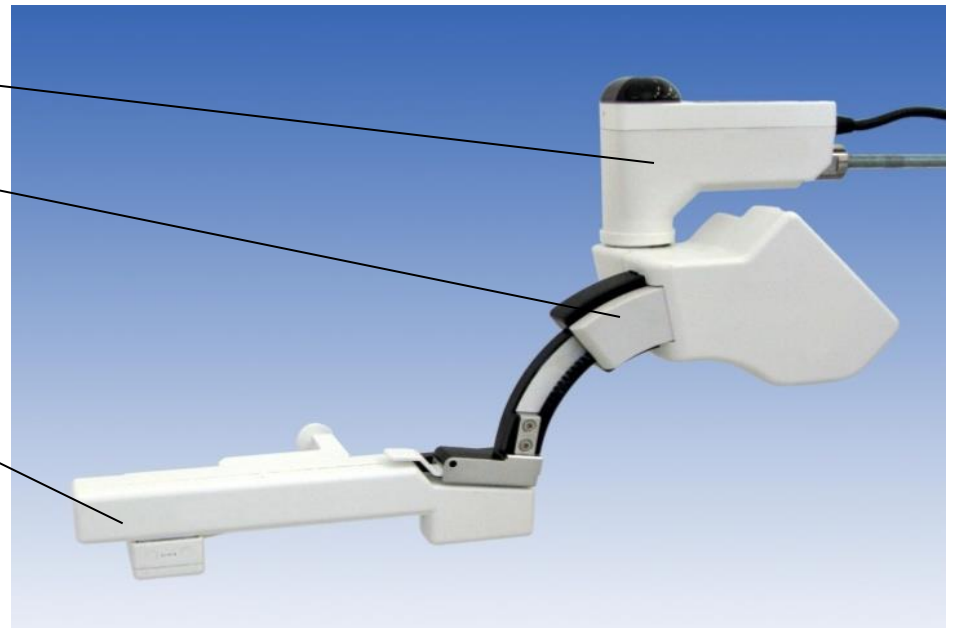
- ▶ Small Robopsy structure intended as disposable solution
- ▶ Reusable motor control with software to access standard CT data and calculate trajectory
- ▶ 3 phased approach proposed with 2 check points for doctor



# Robotic camera control system for MIS

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- ▶ Johnson Medtech content: electromechanical pan, tilt and linear axis
- ▶ MIS: Outside camera holder and easy positioning drives controlled directly by the surgeon, consisting of:
  - ▶ **Reuseable Pan unit**
  - ▶ **Reuseable Tilt unit**
    - long term, robust operation
    - precise pan and tilt movement
  - ▶ **Disposable Zoom unit**
    - linear drive for zoom
    - manual overdrive for emergency
    - completely disposable



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# Laparoscopic camera directly controlled by surgeon

- ▶ Immediate and precise control of scope position and focus
- ▶ Pan, tilt and linear motion axis



Tilt head down -  
scope zooms in



Tilt head back -  
scope moves out



Tilt head down -  
scope tilts downward



Chin up -  
scope tilts upward



Head to left -  
scope pans left



Head to right -  
scope pans right