Medical Robots

Surgical Assistants

- Efficacy of Procedure
  - Accuracy
  - Longevity
  - Invasiveness
- Augment human capabilities
  - Enabling new procedures
  - Time under anaesthetic
Surgical Robots

- Autonomous
  - Robodoc (Curexo)
- Guided
  - RIO (Mako)
- Tele-Operated
  - daVinci (Intuitive Surgical Systems)
  - Sensei (Hansen Medical)

Autonomous Surgical Robots

Robodoc.com
Guided Surgical Robots

Makosurgical.com
Autonomous / Guided
(Planning Required)

Tele-operated Surgical Robots

Intuitivesurgical.com
Tele-operated Surgical Robots

Atrial Fibrillation Ablation
Remove (ablate) unwanted conduction paths in Atria
PCB Etching
Remove unwanted conduction paths from conductive (copper) sheet

Safety Systems
- Static balance
- Back-driveable joints
- Minimum torque motors
- Redundant sensors
- Normally-on brake
- Sensing
  - Over-current
  - Over-heat
  - Over-speed joint
  - End-effector force
  - Loopback continuity