



Medical & Health robotics @QUT

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Queensland University
of Technology



Our vision

A world in which robotics technology enables affordable medicine for all

Our mission

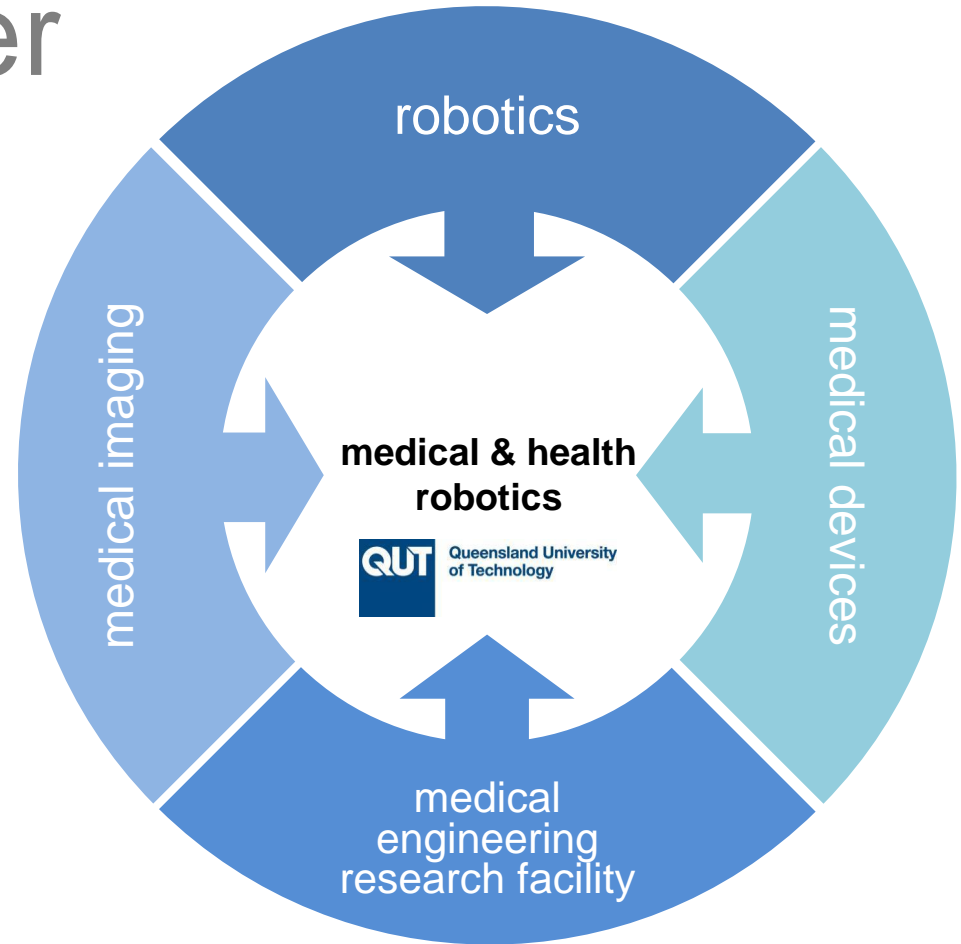
To develop robotic vision techniques and associated technologies to assist medical practitioners in driving down the cost of medicine



Working together

This area of research
is very multi-
disciplinary

It is only viable with a
team approach



Medical robotics

History

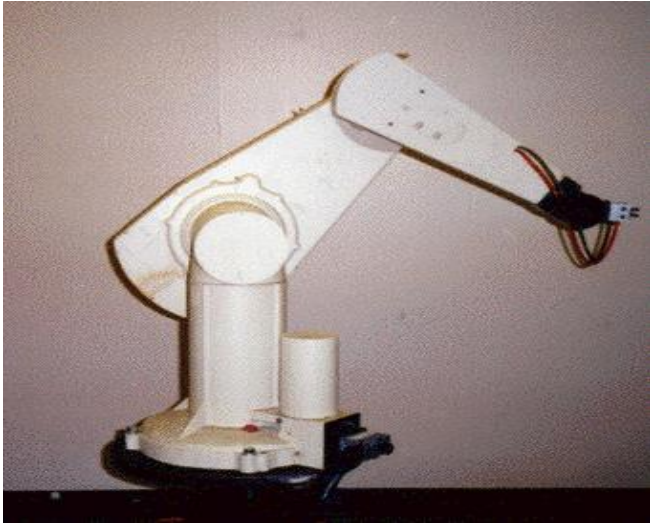


Image of PUMA 560
<http://iel.ucdavis.edu/projects/robot/Puma560.html>

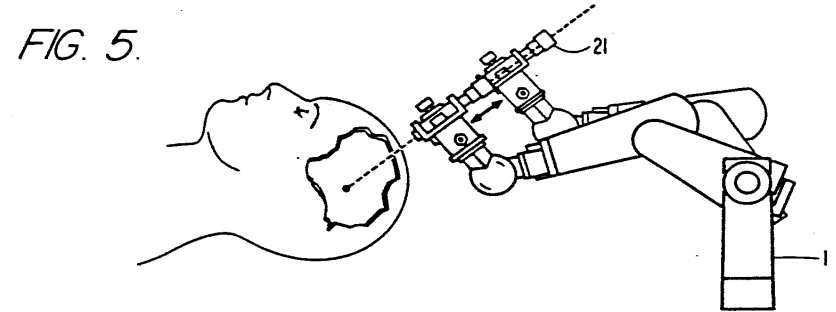
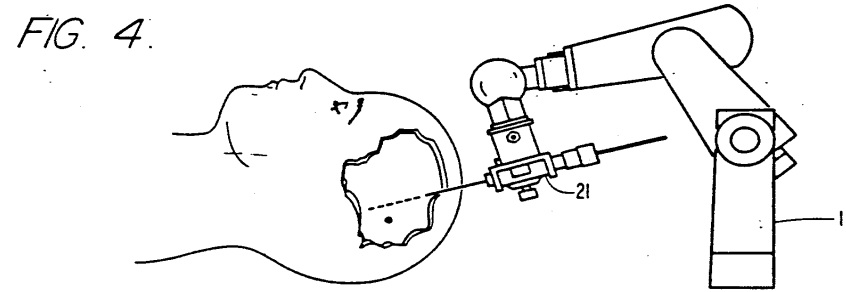


Image: Google Patents

first robot assisted surgery happened in 1985

Medical robotics

Now



The Da Vinci system

Use of medical robotics is becoming widespread in the developed world

Medical robotics

Methods



Tele-robot (surgeon controls robot manipulators from a console)

Pre-programmed (surgeon as a supervisor and programmer)

Shared (surgeon uses hands to directly move tools but robot will prevent cutting in the wrong location)

Operating on people IS NOT like car assembly!



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Medical robotics

Robotic vision

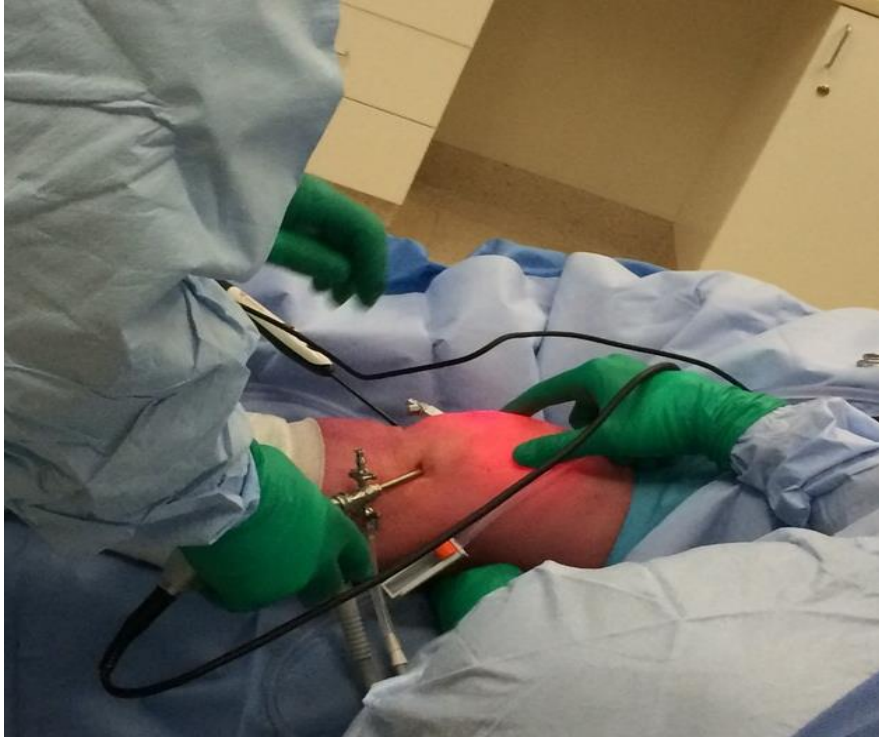


The next improvement in medical robotics will probably require robotic vision

In most procedures, vision is the surgeons most important sense

Blind robots are only smart tools – not true assistants

Example: Knee arthroscopy



Knee arthroscopy

The robotics research challenges

- This is NOT medical imaging
- Vision and multiple actions
- It is hand-eye coordination – but by a robot



Non-technical challenge

stakeholder acceptance

- History shows that stakeholders, e.g. patients, doctors, hospitals, care institutions and authorities, are slow to adopt robotics
- But, once they do accept it, then it can quickly become a de-facto standard way of operating acceptance

Will we still need surgeons?

Yes!

Computerisable				
Rank	Probability	Label	SOC code	Occupation
1.	0.0028		29-1125	Recreational Therapists
2.	0.003		49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers
3.	0.003		11-9161	Emergency Management Directors
4.	0.0031		21-1023	Mental Health and Substance Abuse Social Workers
5.	0.0033		29-1181	Audiologists
6.	0.0035		29-1122	Occupational Therapists
7.	0.0035		29-2091	Orthotists and Prosthetists
8.	0.0035		21-1022	Healthcare Social Workers
9.	0.0036		29-1022	Oral and Maxillofacial Surgeons
10.	0.0036		33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers
11.	0.0039		29-1031	Dietitians and Nutritionists
12.	0.0039		11-9081	Lodging Managers
13.	0.004		27-2032	Choreographers
14.	0.0041		41-9031	Sales Engineers
15.	0.0042	0	29-1060	Physicians and Surgeons
16.	0.0042		25-9031	Instructional Coordinators
17.	0.0043		19-3039	Psychologists, All Other

thank you