

Ph.D. Project Title:

Development of a Touch Sensor for Cochlear Implants

Ph.D. Project Title:

Mechanical Modeling of Cochlear Implants

Supervisor: Dr Paul Stoddart

Project Description:

Cochlear implants are surgically implanted to provide a sense of hearing for people who are profoundly or severely deaf. Approximately 100,000 people worldwide have received cochlear implants so far. However, the delicate internal structures of the ear can easily be damaged when the implant is inserted.

This project aims to develop an “Optical Fibre Touch Sensor” that will guide the surgeon when inserting the cochlear implant into the human ear. This will lead to a significant improvement in patient outcomes by protecting the delicate internal structures of the cochlea and thus preserving any residual existing hearing. The “bionic ear” was invented in Australia and this project will help to ensure the continued success of Australia’s world leading implant industry.

There are two exciting opportunities for students with outstanding academic records and exceptional practical skills to assist in the development and evaluation of the system. One student will assist in the optical design of the sensor and perform systematic studies on the fundamental operating principles. The second project will focus on finite element modeling of the implant so that the mechanical interactions between the implant, sensor and cochlear environment can be better understood. Both students will gain invaluable exposure to industry needs as part of an ARC Linkage project with Cochlear Pty Ltd.

The successful applicants will have a first class Honours degree or equivalent in Engineering, Physics or a related discipline. Post graduate qualifications or work experience in a research environment would be highly regarded. The project is suited to a highly-motivated person who enjoys problem solving and working in a team environment. Generous top-ups are available for students that obtain a Swinburne postgraduate research scholarship.