

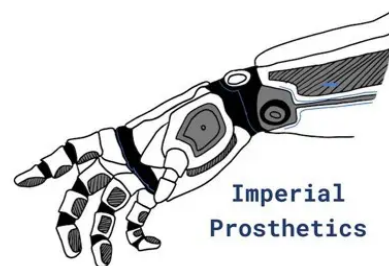
Young Member Panel: Community and Charity Grant

Student Team Benefitting from the Grant: Prithvi Philip, Asmith Khan, Veronika Strasser, Yuhan Liu, Joshua Tampubolon, Jingfei Wang, Sara Galal

Reason for Grant: Funding for the development of a rotary adaptor compatible with the International Committee of the Red Cross' transfemoral prosthesis.

Date Awarded: 30th October 2025

Amount of Grant Awarded: £500



Introduction

The student group receiving this grant is a sub-team of the Imperial College Prosthetics Society, a student-led group focused on the development of prosthetic technologies and surrounding knowledge exchange. The Affordable Team is the newest of the 4 sub-teams of the Society, being founded last academic year, and focuses on the development of affordable prosthetic devices. The need for prosthetic devices exists overwhelmingly in low-to-middle income countries, yet, due to the technologically advanced nature of prostheses offered by leading manufacturers, are out of range financially for many.

Organisations such as the International Committee of the Red Cross, alongside local schools of prosthetics and orthotics, help to fill this gap. The focus of this project has been around the standard issue transfemoral (above the knee) prosthetic leg provided by the ICRC. Although this leg is affordable and durable, its simplicity has its limitations. The leg is only capable of flexural movement, limiting the ability of the knee to rotate. This hinders the everyday actions of its users, including sitting crossed legged, praying, and driving - to name a few.

Current rotary adaptors on the market, such as those offered by Ossur and Ottobock, are both incompatible with the ICRC leg and unsuitable in price. The core aim of the Affordable Team has been to design and develop an ICRC-compatible rotary adaptor, that is contextually suitable both in cost and lifestyle to its primary users. The ICRC has provided over 400,000 prosthetic services since 1971, indicating many potential users for the device [1]. This need was further validated by discussion with local prosthetists at the Cambodian School of Prosthetics and Orthotics (CSPO).

Objectives of the Activity

To design and develop a rotary adaptor that:

- a) Interfaces with the transfemoral prosthesis offered by the ICRC
- b) Is able to withstand the daily needs of its users
- c) Realistically integrate into prosthetists workflows in LMICs
- d) Is affordable

The objective of the Activity is to additionally enable its members to:

- 1) To develop technically through the acquisition of engineering knowledge.
- 2) To allow for interdisciplinary exchange, beyond that which might be accessed by any team member on their respective university programmes.
- 3) Develop collaborative skills in a relaxed but structured environment, with benefits both personally and professionally.

Individuals' Experiences

The following encapsulates the individual experiences of three different team members, and what they felt the Activity has given them. Excerpts have been paraphrased where necessary for clarity.

“I got to experience the full product development cycle from ideation, through to production, contributing throughout. It allowed me to gain a better understanding of the field of prosthetics and learn about the main constraints with regards to their design. Technically, I got exposure to industry level engineering software (ANSYS Mechanical FEA and SolidWorks), improving my skills. Finally, I also experienced hands-on manufacturing, in particular Computer Aided Manufacturing (CAM).”

“From a personal perspective, the project allowed me to learn CAM, design for injection moulding and design for manufacture and assembly. I improved my rapid prototyping skills and documentation skills, working alongside experts in the field. I improved my leadership skills, having the ability to experience what it is like to build a team off the ground from project conception. It was also an opportunity to develop my user centred design, designing the adaptor with users at the centre, taking into consideration the needs of users and manufacturers.

Looking at the wider impact of the Activity, it has given university students an opportunity to work on a project with industrial rather than one limited to just the scope of their degree. Fundamentally, it is a charitable project, where members are motivated by impact. This has allowed us to speak with people from across the field of prosthetics, from the ISPO (International Society of Prosthetics and Orthotics), CSPO through to Go Assistive Technology, a lower limb prosthetic startup company.

“My favourite aspect of this project has been the ability to work with some incredibly talented people. It is a unique experience at university to be able to have such an exposure to industry and projects with meaningful impact potential. I have been stretched technically, learning about manufacturing constraints that are not otherwise taught in my degree.

The project itself acts on a highly specific, relevant problem to users of the ICRC transfemoral prostheses. Without the structure and setup of the Activity, it is unlikely that I would have stumbled on this problem alone, nor been able to address it with rigour that comes from having a multidisciplinary team.”

Benefits Taken Beyond the Activity

The Imperial College Prosthetics Society at large hosts a range of events for the professional development of its members, from technical workshops (FEA, CAD...) to guest speakers such as the quadriplegic Alex Lewis. As members of the Affordable Team, and by virtue the Society, all participants had access and the freedom to engage in these events.

Members of the team attended different events, largely due to schedule constraints. The events provided a range of networking opportunities, across the Society, with industry, and Imperial's Prosthetics and Limb Loss community.

As detailed by the excerpts of individuals' experiences, the skills acquired through participation with this activity will no doubt be used time and time again in the remainder of their studies and their future professional careers.

Although it can be challenging to balance a degree with additional extracurricular engineering activities at times, the benefits brought about by the Activity are too plentiful for it not to be recommended to future students.

Opinion on Funding Extent

The Affordable Team views that £500 is a generous, but suitable, contribution to a student engineering project of this size. The funding has allowed the team to rapidly prototype without burdening its members financially. This has enabled the freedom to purchase necessary materials quickly and in turn iterate rapidly. Furthermore, the knowledge that the project has been funded by the IMechE has driven motivation internally and contributed to its publicity.

A Concluding Thank You

It is an understatement to say that this activity could not have run the way that it did without the support of the IMechE. We hope that this report serves to show some of the multitude of positive benefits it has had on its participants, and we hope that it reinforces the value of supporting other student engineering project teams in their own endeavours.

For any further questions, please do not hesitate to contact sg3323@ic.ac.uk.