

# Incorporation of Hammermen Scholarship Report

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Thanks to the Hammermen Guild I had the opportunity of a lifetime to travel to India to undertake a 3 month engineering internship through IAESTE. The International Association for the Exchange of students for Technical Experience, known in short as IAESTE, operates in 80 countries worldwide. It was set up in 1948 in the aftermath of WW11 with the objective to increase international understanding and cooperation. 68 years later and it is the largest organisation of its kind, on average 5000 traineeship places are exchanged each year, enabling students like myself and industry to profit from the internationality of the organisation within the global economy. In 2016, I was one of the students lucky enough to be offered an internship. From the moment I knew I would be going to India a few new activities were added to my bucket list; to learn how to Bollywood dance, go on one of the epic Indian train journeys and of course see the Taj Mahal.

My internship took place in Karunya University, where I worked in the research and development field of the mechanical engineering department. Karunya University is a campus just outside of Coimbatore, the second largest city in the state of Tamil Nadu. Coimbatore itself had a population of over 1 million and is a major hub for textile industries, commerce, education, IT and healthcare. Karunya University is an Evangelical Christian University with a vision to address the problems of humanity through teaching and research. The institute was inaugurated in 1986 as the Karunya Institute of Technology and in 2004 gained University status.

25 other interns from 15 different countries around the world joined me and together we set about our international exchange. India is busy and vibrant place with a culture wildly different from what most of the interns were accustomed to, so it was comforting having a group of people all going through the same experience. This internship for me was as much about the cultural exchange as it was gaining engineering experience.



The main purpose of my time in India was of course my technical project. The focus of my project was to investigate and improve the performance of heat pipes in the antigravity orientation to aid the thermal management of electronic devices. I worked within a small team of lab technicians and PHD students under the supervision of Dr Godson. The project was primarily experimental as we designed, manufactured from scratch and tested the new heat pipes in the Advanced Thermal Sciences Laboratory. I found that it was an interesting project as I could clearly identify the benefit that improving the designs could bring. Initially the project involved a lot of brainstorming in order to develop innovative ideas and feasible methods of testing them. I felt that my degree gave me confidence working in the lab and good understanding of the thermodynamics that I applied during this project. The whole team was welcoming and friendly and went out of their way to make Karunya feel like a home away from home. As well as taking on all of their technical advice they also gave me a lot of worthwhile tips on what to order in the canteen!



The overall project was successful and we were able to draw meaningful conclusions from the experiments conducted. Therefore as part of this project I have written a paper "Performance of cylindrical and flattened heat pipes at various inclinations including repeatability in anti-gravity – A comparative study" for the Journal of Applied Thermal Engineering that is currently in the process of publication. For me this is a huge personal achievement as it is my first paper and I learnt a lot about the differences of writing a journal paper in comparison to a university dissertation and it gave me a greater insight into the life of an academic, which I found particularly interesting given that I am still at the stage of deciding what I want to do in my future career.

As well as working, I spent a lot of time immersing myself in Indian culture, from making friends with the students, to the clothing, food and religious traditions, India was certainly an exciting place to be and couldn't have been further from what I had grown used to growing up in Scotland. Not only did I learn about Indian culture but the cultures of the other interns, which is part of the experience that I probably enjoyed the most. Most weekends we organised trips to other parts of India, my first trip was to the hill station of Ooty – said to be the Scottish Highlands of South India - although I don't remember seeing so much tea being grown in the Cairngorms! I went to India's most southerly point, stayed in a houseboat in Allepey, went hiking and camping in the Himalayas and even attended a wedding! Just a few highlights from my trip.

One of the best events that the local IAESTE team organised for us was International Evening, it was an opportunity to show off our national dishes and costume. For which myself and the other Scottish intern made shortbread and attempted macaroons. I dressed in a sari for the first time, which is a far more complicated process than I could have imagined. All of the interns learnt and performed a Bollywood dance at the ceremony, which was the first thing ticked off the bucketlist! I spent the last month of my trip travelling, in which time I took many trains and can safely say that any train journey in India can probably be described as epic! And of course last but not least I did finally make it to the Taj Mahal, and it was every bit as beautiful as imagined.



Overall this was an incredibly valuable experience both in terms of work and culture, and I am incredibly grateful to the Hammermen Guild for their generous support that made this trip a reality.