Hammermen Scholarship 2019 Report

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Picture the scene, me, a fourth-year engineering student, clueless as to how to spend my final long, summer as a student. I had a few boxes that I wanted to tick: I wanted to gain relevant engineering experience to help with my future career prospects; my dissertation, which I was working on at the time, concerned renewable energy technologies – a topic I was really enjoying, so ideally I wanted to work within this sector; and finally, I had spent my third year abroad at Heriot-Watt's Malaysia Campus and so I was again looking for my fix of international experience. So, renewable engineering experience abroad – how could I find that?

The Hammermen Award is a grant awarded to a Scottish mechanical engineering student each year to enable them to spend their summer gaining international experiences that would otherwise not be realisable. I read all about the reward, all of the previous awardees' reports and ardently got to work on my application. I spoke with Dr O'Donovan, a lecturer previously based in Edinburgh and now in Dubai, and he agreed to supervise me on my proposed solar thermal project at Heriot-Watt's Dubai Campus (renewable engineering experience - tick, tick and tick). I was lucky enough to be one of the two successful Hammermen applicants for 2018.

Suitcase packed and overnight flight boarded, I arrived in Dubai and headed straight to the university to get started on the project. Dr O'Donovan gave me two routes I could go down upon arrival – either work with a UK company on their innovative solar thermal technology or set up the solar panel on the roof of the University for experimentation. Unfortunately, I was only able to commit one month to my time in Dubai due to other commitments later in the summer. I deemed this too little time to work on the emerging solar thermal technology – this was late May and the project was not set up – and so myself and Dr O'Donovan agreed that I could add the most value to creating a sound experimental procedure for the solar thermal panel on the roof of the university.

Heriot-Watt's solar thermal panel

To describe solar thermal panels to the layman, they use sunlight to heat a liquid which heats your home – not to be confused with solar PV panels which convert sunlight into electricity to power your TV or microwave. They can be used in conjunction with a traditional boiler to lower your carbon footprint and lower your bills. It was my aim in Dubai to put in place all the necessary hardware and software so that any undergraduate mechanical engineer could walk up to the solar panel, understand how it all worked and collect data from it for later analysis. I started by investigating what the current set-up on the roof was. The first lesson I learned was that Dubai is hot, very hot, and so the hours of 12 to 3 should not be spent outside in direct sunlight in what was basically the middle of the desert,

where temperatures would routinely reach $40℃$, and should instead be spent at my airconditioned desk. Knowing the current state of the set-up, I made a to do list:

1. Learn how it works and how it should work
2. Install the necessary hardware to make the set-up safer and more intuitive
3. Write code to measure and collect all the necessary temperatures, the flowrate and the solar incidence
4. Learn to code
5. Write an instruction manual, explaining points 1-4, as well anything that would benefit the user. Like how to switch it on

The existing experimental procedure was slightly archaic - the flowrate of scalding hot water was measured by holding a glass beaker in one hand and a stopwatch in the other, rather unsafe. A flowmeter was instead installed. Having always shied away from coding, the task of creating a programme to record all the necessary parameters seemed a bit daunting. I used LabView which is actually quite an instinctive programming language. It uses a graphical language which I would describe as drag-and-drop pictures, something I wouldn't have considered as programming before this project. I produced the instruction manual and code and made this available for future undergraduate engineers to use and modify. Set-up times (including understanding how it all works) for this experimental equipment have been greatly reduced. I would like to thank Dr Rebecca Lim, my day-to-day supervisor, without her guidance and willingness to answer all my questions, the project wouldn't have been the success it was.

Burj Al Arab, 'the world's most luxurious hotel', maybe next time if budget allows...

Dubai is a truly breath-taking place. The first thing you notice whilst wondering around the city is the sheer size of everything. Travel to the Mall of The Emirates and you will find one of the world's largest indoor ski slope (in the middle of the desert!) or go to Dubai Mall and you will be inside the largest mall in the world, and step outside Dubai Mall and you will see the Burj Khalifa, the world's tallest building. Dubai is staggering.

The Hammermen Award aims to give the opportunity to an engineering student to not only gain technical experience, but also immerse themselves within a new and alien culture. This was definitely the case. My stay overlapped with Ramadan; praise to those who fast from sunset to sunrise in the baking hot sun of the Dubai. A benefit of me being there during Ramadan was I was able to take part in Iftar, the meal at sunset eaten by Muslims during Ramadan. I stayed in Uninest, a student accommodation building, which was full of similarly aged people to myself from all around the world. My first Iftar was in Uninest and was spent with people from America, Russia, India, Germany,

Colombia as well as a few from the Middle East. I recommend Arabic cuisine to anybody who loves bread, rice and meat – and who doesn't?

Views from helicopter ride

During my time not spent working on my project, there was no shortage of things to do. Uninest organised a trip to a night time disco at Atlantis Aquaventure waterpark. I discovered Irish Village as my home away from home to watch the World Cup. I was able to meet up with my friend Humam from Abu Dhabi who drove me around and gave me an insider's tour of Dubai. The best way to see Dubai is from the sky. I was fortunate enough to be able to go on a helicopter tour. The way skyscrapers rise out of the sand is astonishing.

My time spent in Dubai not only helped me grow as an engineer but also helped me develop as a professional. Coming to the end of my time in formal education, I would encourage anybody who has not yet done so, to travel and work abroad, whether this is a year abroad or an internship in a different country. After your first taste of international experience, you'll be hooked. You will find yourself in places you wouldn't have dreamt existed with some of the most amazing people. And so, I would like to again say a massive thank you to The Hammermen of Edinburgh for their generous support for helping me gain invaluable work and life experience.