Final Report – TESS 2021 – Paul Mifsud

The TESS scholarship scheme helped me fund my master studies in Mathematics at the Karlsruhe Institute of Technology (KIT) in Baden-Württemberg, Germany.

KIT is a prestigious technical research university, part of the TU9 cluster of institutes of technology, and part of the group select universities which were awarded the Excellence status in Germany. Moreover, it produces more research in the fields of natural science and technology, than any other German university.

At KIT, I was enrolled as a Mathematics master student. I took courses in a broad range of topics in an attempt to explore many fields and figure out a future career path. I explored amongst others, the areas of discrete mathematics, functional analysis, differential geometry and many topics in numerical analysis and numerical linear algebra. Moreover, I took courses in computer simulation of molecular dynamics and courses on machine learning and data science.

One of the nice aspects of german university culture is the low barrier between teaching and research. Master and even bachelor level students can join research groups with ease and be part of the very cutting-edge of research and innovation. Taking advantage of the opportunity, I searched for an interesting research topic and stumbled upon a research group in a mechanical engineering institute. The mechanical engineering institute is focused on improving the efficiency of turbomachinery, and I was tasked with devising methods to accelerate the computer simulation of the next generation turbojet engines. To achieve this aim, I employed cutting edge deep learning techniques and trained my models on one of the fastest computing clusters in the world. In doing so, I gained two years of academic research experience in the field of deep learning, experience programming deep learning models and training them on high-performance computing clusters and experience in academic publishing.

When the principal investigator of my research group decided to organize a conference, I was asked to help, and in doing so I gained valuable experience in the organization of academic conferences. At the same conference I also had an opportunity to showcase my work in the form of a poster, and I also had the opportunity to network and meet a lots of academics in the same research field.

On another occasion, I took part in a week long workshop with the aim of creating optimization algorithms for improved layering of carbon fibre, to improve the characteristics of composite materials. On this occasion I happened to be the person with the most experience and expert knowledge in the team and it was an instrumental moment when I had to assume leadership and guide the teams effort.

I am grateful for the financial help that the TESS scholarship scheme provided, to enable my education, because all these valuable experiences have set me up for a bright career future.