At the end of February 2020, I left the University of Bath and headed to the University of Arkansas with the intent to complete a two-month research visit with Professor Alan Mantooth’s MSCAD research group in the US. The focus of the trip was on wide band gap (WBG) power semiconductor converter design, modelling and optimisation. I brought with me my own high-power density prototype silicon carbide inverter to test at the National Center for Reliable Electric Power Transmission (NCREPT) test facility there.

My research plan was broken down into several parts including high-power lab testing, modelling techniques, design automation, power electronics packaging and power module integration. The MSCAD research group have world-leading research and expertise in all these areas and are collocated with a number of industry leading companies in this area. My plan was to work with members of the group to augment my understanding of each topic on a week-by-week basis and find new research avenues to pursue collaboratively and at later stages of my PhD.

The first week of my visit was primarily taken up with registration, facility tours, health and safety training and unpacking. I met with Professor Mantooth where we discussed my research plan and agreed a timeline for my test plan. I then went about beginning to write a formal test plan, now knowing what facilities would be available, including 400 kW controllable DC supplies, 1 MW resistive load banks, a plethora of 10 to 50 kW power supplies and 100 kW+ permanent magnet synchronous machine dynamometer facilities, all with a state-of-the-art remote control room at NCREPT.

During the second week of my visit I was introduced to a number of experts in power device modelling within the research group. We discussed my experience using such models and how the models were validated. We had a few interesting ideas for papers that could be pursued in the future. I also gave a presentation on my own research to all members of the MSCAD research group, so they had a better idea of what my goals were.

Midway through my second week, the University of Arkansas advised all researchers to work from home, cancelled all large gatherings and moved all teaching online due to COVID-19. This left my test plan and ability to achieve my research goals in doubt. I continued some of the modelling work I had already begun from my accommodation and began making contingency plans to return to the UK. On the Sunday of that week the UK FCO changed their US travel advise to all but essential travel and my supervisor, among others, advised returning to the UK. With the prospect of lockdown now a reality and significant travel disruption only hours away, I rebooked my flights and returned the next day, cutting my visit short by 6 weeks.

While it was unfortunate that I had to curtail my research visit, for the short time I was there I did manage to make some invaluable contacts who I hope to be able to collaborate with on publications in the future. I am thankful to the IET for the travel award which covered most of the flight costs and enabled this research visit to take place. I hope to be able to return to Arkansas in the future to finish my research visit and collaborate further with the research group there.