PhD Studentship in Shell University Technology Centre at Imperial

I would like to apply for the PhD at Imperial College London sponsored by the Shell University Technology Centre to explore fluids and lubricants in engine efficiency.

Working with and doing research on engines has been an interest of mine throughout my academic and personal life. My final year project during my BSc in Mechanical Engineering at The University of Manchester explored how different pressures, temperatures, and strains on aerodynamic materials in engines affected fuel flow. I used luminescent coatings in a modified engine and developed a protocol using high-powered LEDs and fast framing digital cameras to gather data on how differing conditions affected the efficiency of the engine. Having never used luminosity spectroscopy techniques before, I had to teach myself. With the support of a PhD student and a process of trial and error I was able to establish a new robust protocol that suited the equipment I had available. This was my first real experience with research. It did not always go to plan, and I had to adapt my thinking throughout the process. I found seeing viable data being produced from something I had created thrilling. This experience helped me to appreciate the need for developing rigorous protocols and having a disciplined work habits to ensure consistency within testing. It also drove me to apply for the MSc in Advanced Mechanical Engineering at Imperial which I am currently undertaking. While my project for this programme is not finalised yet, I am currently discussing with Dr Wong of the Tribology group a suitable experiment involving engine efficiency testing to build my knowledge further in this area.

My long-term career goal is to work as a researcher straddling industry and academia developing innovative vehicle engines. During last summer I undertook an internship with Pirelli to help me better understand how the racing industry works. I worked within the multidisciplinary research and development team, testing and developing new components and processes for racing car engines, all of which I am unable to discuss as I signed a non-disclosure agreement. However, the experience helped me to understand much more about the industry, the intensive, focused nature of a workshop environment, and the drive required by the team to develop the best outputs. I found I thoroughly enjoyed working in this environment and seeing how the innovations I was developing were very keenly appreciated and anticipated by the drivers of the Pirelli cars, who I interacted with during an audit project I conducted. This experience helped me to reality check my stated career goal and solidify my motivations for applying for this PhD.

Aside from the topic, many of the other aspects of this PhD fit with the skills and attributes I know I will need for my future. Having spoken to Dr Wong I am excited by the international collaborative approach with Shell involved in the research. During my undergraduate degree I was part of a team that competed in the Shell Eco-Marathon, an international competition to design an eco-friendly vehicle, in which we came third in the UK. Our team of six comprised individuals from five different cultures and, as we progressed through the competition, I was able to discuss our designs further with other competitors from across the world. I thrived on hearing how people from different cultures and backgrounds interpreted what we had designed, and their ideas challenged me to create better products. I hope to continue working in this way during the PhD if I am lucky enough to be offered it. I am also drawn to the experimentalist approach mentioned within the job description. While I enjoy the academic nature of research, I am also actively building my practical workshop knowledge by joining the Imperial Racing Green team. My role within this group is to support in the upkeep of motors, from the vintage vehicles the group maintain through to the new sustainable engines we are developing that will run on waste oil. I hope to combine my practical and academic knowledge into my future career.

I enjoy communicating and supporting others to understand engineering concepts and hope that I will be able to undertake graduate teaching assistant (GTA) training alongside the PhD. I have recently begun building on my communication skills further by becoming an outreach presenter in the Imperial College outreach team where I work in a team to deliver presentations to high school classes promoting science and engineering. We develop and run fun, interactive sessions which help make the topic accessible to all and build inclusivity. Having to adapt my presentation style and answer any and all questions that we receive during the sessions has not only built my communication skills, but my confidence in both myself as researcher and my desire to continue toward my career goal.

Thank you for this opportunity and I hope to hear from you soon.