Purin Sukpanichnant

Undergraduate, Year 1 in 2020-21, MEng Computing, Department of Computing

UROP: Summer 2021 (undertaken in the Department of Computing)

Title (initial): Explorations on deployment of Deep Argumentative Explanations

Title (final): LRP-based Argumentative Explanations for Neural Networks

Ever since I started attending university, my goal has been to explore both industrial and research sides of computing. Rather than applying for an internship in the first year, I decided to explore doing research, and idea that really interests me. Indeed, I am contemplating about pursuing a PhD in Computing and wanted to get a taste of it. Around the time before the Autumn term, I was made aware of an opportunity called UROP from one of the Imperial blogs. As I deemed it a great chance to gain some research experience, I decided to do a UROP project during my first-year summer.

Having decided to undertake a UROP, the next step was to search for a field or topic to work on. My interests are in AI, machine learning and logics, so I searched for any research group that suits my interests from Department of Computing website. I also had a conversation with some second years who did a UROP project in the past. One of them suggested me a research group called Computational Logic and Argumentation (CLArg). The research topics of this group really fascinated me, especially the field of Explainable AI (XAI). I thereafter had a chat with one of the PhD students in that group to learn more about XAI in general. After the conversation, I decided to dive deeper into the field of XAI so I contacted Professor Francesca Toni – the head of the CLArg group, and asked whether I could do a UROP project on this field under her supervision. Fortunately, she agreed to supervise me for a UROP experience.

I approached and secured a UROP with my supervisor around November, but it was not until February that both of us got to decide the project to work on. Once the project idea was agreed, I applied for a bursary for my UROP. Luckily, I found out around mid-April that my bursary application had been successful and I was awarded an Imperial College UROP award covering my expenses during the UROP. Once my bursary was settled, I had an online meeting with the professor and a researcher who would co-supervise me. The meeting was around June. We discussed the details of my project and what preparation I should do in advance. From there until my UROP started in early July, I had been reading research papers my supervisors gave me and learning some deep learning fundamentals including Keras API in Python.

Undertaking a UROP allowed me to develop a wide variety of skills. Firstly, my programming skills. My project was initially about exploring a software library written by a group of third years. As a result, I got to brush up on my Python skills, and try my hands on NumPy and Keras API for building an algorithm to explain a neural network model. As a first-year student, I did not have much experience with software development so it was daunting at first, but things became more manageable as time went by.

Secondly, my time management skill. UROP did not actually have a deadline set on when a specific task must be finished. I was therefore allowed to finish whatever tasks whenever I wanted. Still, this flexibility made time management vital since it was tempting to procrastinate. Setting a list of goals for each week and planning my daily timetable were indeed helpful since I could see my progress and spend my time efficiently.

Lastly, my literature reading skill. During the second half of my UROP, I had to do some theoretical work so I was required to peruse some academic papers. It was during this time that I comprehended the structure of a typical

research paper and how to find main ideas for the paper. Most crucially, I learnt to analyse and think about how to apply what I read to my work. I firmly believe this skill will be beneficial when I need to do my research in the future.

Apart from all the skills I have polished during my UROP, the best thing I gained was inspiration. As part of the research group, I was invited to join a weekly group discussion as well as some seminars about XAI. The group meetings were far from what I previously thought they would be. There was absolutely no pressure at all. People were there discussing their work, sharing new ideas, and chatting about things in life. It was a pleasant and fun atmosphere to be in, yet the content was stimulating. The seminars also gave me new insights and introduced several fields and opportunities I could explore further.

Overall, the experience I have had throughout my UROP has been brilliant. I managed to have a proper research experience including reading papers, implementing the code, discussing my work with others, writing a report of my work, and presenting my work to the group as a closure. It made me view academic research less daunting. Even though the prospect of me doing a PhD is still uncertain, this UROP experience will be crucial when I have to decide my journey after the graduation.

For anyone thinking about doing a PhD, or would like to get a sense of academic research, I would definitely recommend giving UROP a go. It would be a valuable experience for you and help decide your educational and career path. Please do not hesitate to undertake it even if you are a first-year student. I was so concerned at first because my topic was normally taught in the fourth year, but it turned out well and I found it less intimidating as I gradually learnt the basics of it. This is your chance to learn and explore new things, so just do your best and the result will follow.

All the best for your upcoming UROP!