First reflection session Date: June 29, 2023

Before starting my Extended Essay, I was fascinated by reinforcement learning and considered various applications, including Atari games and 2D lunar lander simulations. However, after experiencing a traffic jam, I was inspired to apply this to intelligent traffic system control. After discussions with my supervisor, I decided to focus on comparing two advanced reinforcement learning algorithms in a simulated environment based on my hometown. My goal is to identify a solution for traffic congestion in Hong Kong.

Interim reflection Date: September 19, 2023

After I had done more research on the field, I came across another 2 algorithms that should show a more significant difference in performance compared to the ones I initially selected. Therefore, I reconsidered my choices and evaluated the suitability of the 2 new algorithms for my research.

During the implementation of algorithms, I encountered a compatibility issue between the libraries that I used. Trying to find a solution, I immediately opened an issue on the library's GitHub repository, seeking help from the community. In the meantime, when I was trying to fix the problem by myself, I prepared 2 backup plans in case I could not solve the issue within a week. Fortunately, searching the Internet for a few days, I found someone encountered a similar bug on a library dependency. In the end, I managed to solve the issue by replacing a line in the source code of the library, before anyone had commented on the GitHub issue I opened.

During the configuration of the simulated environment, I noticed that I should go for an on-site investigation to obtain the real data of the traffic network around my hometown. Therefore, despite the hot weather and those annoying mosquitoes, I spent a whole day counting the number of vehicles in different spots around my hometown, some of which I had never been to before.

Final reflection - viva voce Date: June 29, 2023

Reflecting on my journey, I often recall the moment I first met my supervisor. I had planned to use environments from OpenAI Gym for my experiments directly, but my supervisor advised, "Don't limit yourself to this platform." That inspired me to embark on a challenging journey, dealing with various libraries and APIs to set up the simulation environment.

Despite previous challenges, the greatest was the time constraint. After first-year exams, I had less than a month to prepare the environment before starting experiments and writing the essay over summer. The inconsistent mathematical notations in academic papers added pressure. Ultimately, I had to omit pedestrians from the experiment, which is my biggest regret.

Throughout my EE journey, I've learned the value of adaptability and perseverance. Tackling unexpected challenges, from technical issues to time management, has honed my problem-solving skills. I've also gained a deeper understanding of reinforcement learning and its practical applications, all while navigating the complexities of academic research.