Final Reflection

I must say that I really enjoyed the CSE 490R: Robotics course for spring 2019. Sanjiban does an excellent job of explaining the concepts such that they are easily comprehensible but yet not oversimplified that important aspects of the algorithms are missed. The course has really improved since the first time it was taught in winter 2018.

For the most part, I thought the course content was particularly relevant, such as using particle filters for localization, sampling and graph search for path planning, and controllers for following waypoints. All were very relevant to the field of autonomous robotics. Many of the concepts taught in this course transferred to my autonomous robotics capstone course for ECE 497 and 498 and also helped me in my interview with a robotics company.

While I think that the course is very excellent overall, I believe there are several improvements that could be made to course content. While the introduction to ROS and Numpy is certainly useful, I think that lab0 and lab1 can be integrated together. It would also be more interesting actually implement SLAM because it is often used in industry. Furthermore, it would be even more interesting to implement multi-robot SLAM (I think Dieter Fox outlined something like that in his Probabilistic Robotics book); it would be a good opportunity for teams to work together on a much bigger project. Like lab0 and lab1, lab2 and lab3 can also be integrated together if lab2 only requires the implementation of MPC controller and lab3 only requires the implementation of Dubins path planner (because the rest are interesting in theory and certainly applicable but not optimal...so no point in implementing a sub-optimal solution?).

This leaves two labs open. For the new lab3, I think it should involve computer vision, maybe involving convolutional neural networks, visual odometry and/or vision-based localization. For the new lab4, I think it should maybe involve multi-agent reinforcement learning and swarm robotics. It would be a good opportunity to have teams work together on a much bigger project.