

A Simple Mobility Model of Unmanned Aerial Vehicle in Three Dimensions

Spring 2023

CS4000: Individual Studies in Computer Science – Mobility Model Design and Development



In the spring semester of 2023, I got an opportunity to engage in an independent study program under the guidance and supervision of Dr. Lim at Texas Tech University. After finishing my sophomore year Computer Science courses, I started wondering about the practical application of all the knowledge I had gained. Furthermore, I was inclined to acquire firsthand experience and observe the practical implementation of coding in solving real-world problems. As a result, I decided to participate in CS4000: Individual Studies in Computer Science. Moreover, I always like drones, and CS4000 enabled me to work with drones and programming languages. I got a chance to implement the mobility model of an Unmanned aerial vehicle and visualize it in 3D with animation through coding, which helped to sharpen my problem-solving skills. Finally, I got a crystal-clear idea of how coding collaborates with real-world objects.

As a student of Computer Science, I have a good foundation in Java, C, C++, and Python programming languages, but I never used MATLAB before. As a result, I started learning MATLAB from scratch. Dr. Lim used to give me weekly assignments to help me learn MATLAB by producing output. I first programmed a simple mobility model in 3D. When I got good skills with MATLAB, I programmed to generate random paths, calculated the total distance, real-time 3D graph movement, and so on. Thanks to Dr. Lim's assistance, I overcame the challenges of maneuvering the drone based on a specified velocity and time and ensuring its return using the shortest path. Dr. Lim skillfully deconstructed the problem into numerous smaller components, providing me with valuable guidance to implement my program.

The weekly meetings with Dr. Lim are of great assistance, offering a clear comprehension of my tasks for the week and comprehensive guidance on how to approach them. I also gained valuable knowledge about the industry and research field by talking with Dr. Lim, which prepared me for real-world competition. To conclude, I am delighted to be a participant in CS4000: Individual Studies. It helped me to become a better programmer and to learn how to use all possible ways to find a solution to solve a problem. I recommend CS4000 to others.

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