

Computational Modeling of Aircraft Flight and Machine Learning-Based Control

In this presentation, I will talk about general computational flight mechanics, general methods of simulating flight using different tools like Python3 (simulations and mathematical modelling), OpenVSP (CFD), and Python libraries like SciPy and NumPy. I will explain how these tools can be used to model aircraft and simulate flight, using the most basic numerical methods. Furthermore, I will cover how the data generated from these simulations can be utilized to train machine learning models for autonomous flight control, using frameworks like PyTorch or TensorFlow. I will also talk about my goals and plans for this research, including future steps like simulating real 3D flight and adding image processing. I plan to apply these methods to real-life situations, especially for controlling unmanned aerial vehicles (UAVs). This work demonstrates the potential of combining physics-based modeling with machine learning to advance autonomous flight.

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