UROP Project 2020: Rotating blades in unsteady flow

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With the increase in use of autonomous flying vehicles, understanding and controlling the interaction of rotating blades in unsteady flow conditions is increasingly important. This project aims to study the vortex dynamics on rotating blades in the presence of unsteady flow conditions towards improved design and control of rotor blades. The project will consist of helping to take particle image velocimetry measurements of a velocity field around a rotating blade system, helping with the preliminary data analysis using Matlab, and learning about fluid mechanics and rotor blades.

We are looking for someone who is excited, motivated, and eager to learn about fluid dynamics and experimental work. The student will get exposure to the experimental study of fluid mechanics and rotor blades, as well as some exposure to the study of turbulent boundary layers, measurement systems such as particle image velocimetry (PIV) and hotwire anemometry, and basic coding in Matlab and LabView. The student will also gain skills in thinking through research plans and presenting research outcomes.