Summary – Internship M. Voerman

I carried out my internship at RMIT University in Melbourne, Australia. My assignment was provided by The School of Aerospace, Mechanical and Manufacturing Engineering, located at Bundoora Campus. The assignment was about the optimization of the design of an unmanned aerial vehicle, or UAV for short. Vehicles like these are used for both military and civil purposes, like reconnaissance missions or firefighting. At the start of the project, a SolidWorks model of the UAV was given to me. The design contained two counter rotating propellers inside a duct, which formed the body of the vehicle. Because the rudders of the airplane are supposed to guide the airflow that comes out of the duct in order to change the direction of the UAV, it is important that the flow leaves the duct in the straightest way possible. Otherwise the UAV would already be heading in a certain direction with the ailerons in neutral position. One hypotheses that I had to check was whether this is achieved with the current design. I used ANSYS Fluent to model the flow around the object and to see what the effect is of changes in the geometry. All the work that I have been doing for the project, I was able to do from behind my desk. This means the assignment was purely theoretical, so never have I seen an actual scale model of the plane, nor have I been able to do real world wind tunnel tests. I'm aware of the fact that this is just how most of the research in the field of aerodynamics is done these days.