

# COSC3000 Graphics Proposal

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## Background

With orbital rendezvous having become routine in the last few decades (notably with the advent of the International Space Station), the process and danger of docking is little known to the layman. With developing computer graphics technology, this process of two spacecraft meeting in space can be faithfully depicted to a wide audience.

## What

Through the use of computer graphics, the aim of the project is to demonstrate a typical, albeit faster, docking maneuver for two spacecraft in micro-gravity. This will be done by transforming the perspective of the viewer (the camera) via (but not limited to) translation, rotation and scaling so that the camera approaches and 'docks' with a target spacecraft. The idea is to begin with two spacecraft misaligned, and through a series of transformations they will eventually meet at a target point. These transformations will ideally be compiled into a movie that will show the orbital rendezvous and docking process. The project is not aiming for photorealism, nor is it trying to achieve realistic physics, but rather will attempt to show the basic maneuvers needed to dock spacecraft and will be targeted towards a layman audience.

If time permits, interactivity will be implemented (the user controlling the movement and orientation of the spacecraft to approach the target themselves) although this is not a primary goal of the project.

## How

The project will utilise Python and OpenGL to achieve the goal of object transformations, lighting, modelling and texturing etc. It is expected that the course content should cover the bulk of the learning needed to program this project, however further learning may need to be undertaken - particularly for modelling the spacecraft. At this point in time, it is expected that all of the modelling can be done with the aforementioned tools/languages.