

Forward Modelling of Ground Based SST Telescope Images

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Space debris is becoming an increased threat to the future use of space orbits. In order to counteract this threat, the field of Space Situational Awareness (SSA), and the sub-field Space Surveillance and Tracking (SST), have been developed to gather knowledge about the space debris and satellites surrounding Earth. The orbit of a satellite can be determined by acquiring images of the satellite using a telescope and a sensor. During this thesis project, a tool has been programmed in Python. This tool can simulate these types of images of satellite passes, at a given time and location. The simulator takes the system parameters of the telescope and camera sensor into account, together with several different types of disturbances which affect these images. The project has been carried out at the Swedish Space Corporation (SSC), which recently launched an SSA initiative. They plan to use these images to learn more about their upcoming observations, and possibly to test an orbit determination software.

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