| **Group** 13 | *Spring 2024 Design Challenge* |
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| **Major:** | **Team members:** |
| *ITC* | *David Kajuna* |
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**Design Objectives**

Objective 1: The wireless transmission system must transmit 10 1024x1024 pixel images and their hashes. This process must be without loss of data and should take under 10 minutes.

The chosen group transmission system needs to be able to transmit data without loss relatively quickly. For this objective, utilization of a VLC (Visible Light Communication), Li-FI system, will be used due to its fast transfer speed and ability for lossless transmission.

Objective 2: Create a wireless transmission system that is end-to-end encrypted.

All data that is sent must be encrypted before transmission and decrypted after transmission. There is no specific standard for encryption for this objective. Therefore, AES\_256 will encrypt all images and hashes before and after transmission. The sent data will then be decrypted using the same method.

Objective 3: Create a Python application that can evaluate 10 correct images of the Death Star out of a possible 100 images.

The ten images of the Death Star must be found programmatically out of a possible 100 images using a Raspberry Pi in the imperial lab. The Raspberry Pi will use pre-made Python libraries to find ten correct images. Only these ten evaluated images will be transmitted.

Objective 4: Create a transmission system where the md5 hashes of the images before and after transmission are the same.

To guarantee lossless transmission, images will be hashed before and after transmission. This will be done using md5 (message-digest algorithm) both before and after transmission. If hashes are not the same, then lossless transmission cannot be guaranteed.

Objective 5: Create a mobile application that evaluates the weaknesses of the 10 Death Star images and uploads them to an online server.

Evaluating the weaknesses of the transmitted Death Star images will be done by a group-created mobile application. This application will use Python libraries to find weak patterns in said images. The weakness will then be organized into a spreadsheet and uploaded to a server hosted by the group.