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| **Masters Route:** | Tier 4 |
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| **2nd Reader**: | Martin Kane |

# MSc Computing Masters Project Proposal

## Project Title

Automating Retail Store Planogram Compliance Tasks using Mobile Application Equipped with Deep Learning Technique

## What problem are you trying to solve?

It is iterative, cumbersome, error-prone and time-consuming process for a retail store associate to perform planogram compliance related tasks manually. The most critical activities in his daily tasks are monitoring the displays/shelves to make sure the locations of the products are in line with the agreement between the retailer and brand owners, adjusting the wrongly placed SKUs to the agreed or planned display’s locations, identifying the missing SKUs based on the space gaps.

The manual inspection of a product located in a planogram for a specific display against the product actually located in the same position of that display in a store is unmanageable especially in case of large retailer. Further quantity comparison task could be additional burden to store associate and it is repeated for every product. After finding the misplaced product, the store associate depends on manual exercise to take next action on that product like moving it to other location in same display or moving out of display completely. These time-consuming manual activities impacts the productivity of store associate severely.

## Objectives of the project

* To explore how to collect and label the images for object detection using LabelImg.
* To explore how to install Tensorflow object detection model on a local machine.
* To explore how to train deep learning CNN object detection mobile device-based model using Python and TFOD.
* To explore how to load trained CNN model to android application.
* Design and develop a mobile application for store associates to instruct them the next course of actions to be carried out in their daily tasks related to planogram compliance.

## Expected end products

A mobile application with object detection capability by leveraging CNN model SSD MobileNet V2 FPNLite 320x320 to detect the products from a store display and instruct the set of actions to be performed by the store assistant in order to align with planogram.

A detail report on the project work to demonstrate the skills mentioned in assessment criteria.

## Ethical Considerations

### Ethics Declaration:

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|  | **True** | **False** |
| My project is entirely literature based and/or technical, |  |  |
| My Project does not use any form of participants, |  |  |
| My Project does not use external inputs (e.g. liaising with someone in industry), |  |  |
| My Project does not require me to do work off campus (e.g. in a company), |  |  |
| My Project does not use secondary data sets |  |  |

## Justification for Masters level project

The proposed work is completely relative to my enrolled master course Artificial Intelligence with Data Analytics. The field of the study demonstrates good understanding levels in analysing and exploring of CNN models which are good fit for the given problem statement. This assignment should give opportunity to learn the skills on how to build dataset on your own. Apart from adding artificial intelligence to the solution, there is a scope to learn data analytics techniques to be applied on the data produced by the machine learning model. The work also teaches you how to build mobile interfaces to interact with the user and object detection model in back end. To analyse the problem, design and implement the solution it should require good amount of research and so I believe this case study is suitable for a master level project.