

## **Abstract:**

Starting a new job in an office can be very stressful for an intern or a new employee, especially on their first day at the office. It takes time to adjust and learn what other employees' jobs are and how they can be beneficial to them. It might additionally take some time for new members to learn the ropes and their purpose within the office building, while understanding and learning how to use certain equipment, for example, an automatic key lock or simply a coffee machine. Therefore, the Workplace Assistant Augmented Reality tries to identify the user's requirements in accomplishing a specific task within the workplace through user profiling and recommendation, whilst providing the relevant information for the user to learn and understand the environment around them via augmented reality.

The application is intended to guide new employees through an adapted process which enables them to understand the environment around them along with equipment which they might use daily. It will also be intended on guiding the visitors, providing them with relevant information in order to successfully accomplish their task. The system incorporates collaborative filtering and a similarity-based technique using SVD++ and item to item based similarity respectively, to provide recommendations, along with deep learning and traditional computer vision techniques using Vuforia, to provide augmented reality. Using the tools mentioned the system provides information about offices, directions towards specific offices, and information on how to utilise the coffee machine of the company which the application was tailor made for.

From the tests performed the indication is that the SVD++ model was the most efficient model to apply in comparison to other machine learning models, when applied with AR. The model achieved average Root Mean Square Error and Mean Absolute Error of 3.1226 and 2.6866, respectively. The AR component achieved promising distance, colour, rotation and occlusion variance values. Finally, the system obtained on average positive qualitative results via user-feedback along with recommendations on how it may be further improved.