L-Università ta' Malta
Faculty of Information & Communication Technology
Department of Computer Information Systems

Workplace Assisting Augmented Reality (WAAR)

Gabriel Camilleri
Supervisor: Dr.Vanessa Camilleri,

INTRODUCTION

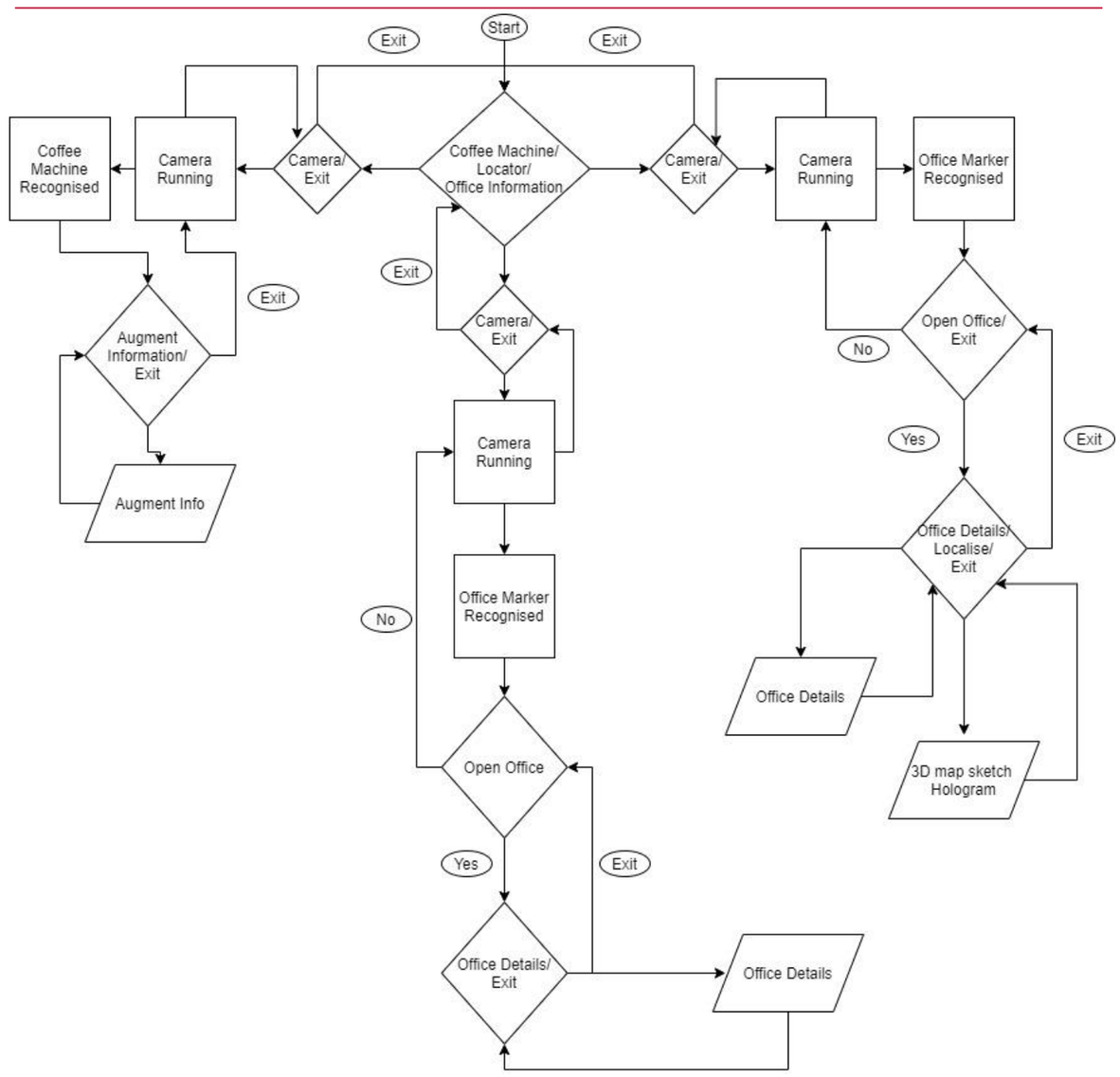
"Person-job fit is a substantial factor for decreasing job stress and the adjustment of employees to an organization is an important issue for eliminating stress"[12]. Providing an assistant augmented reality application for the workplace may provide several benefits as well as challenges. The application may help new employees as well as visitors quickly adjust to the new environment they find themselves in.

Feature extraction on real world objects can present several challenges especially if one might apply traditional computer vision techniques. Applying the correct computer vision models along with the right user profiling techniques is necessary. Thus, users are provided with a seamless and interactive experience to gradually understand the workplace in which they work in, hence eliminating the stress for them to adjust on their first days of work.

AIM

The aim of this project is to research and develop a workplace assistant augmented reality using image and object detection techniques provided by Vuforia along with user profiling to recommend relevant information to the user.

ARCHITECTURE DESIGN



METHODOLOGY

Data Handling → Feature Extraction → User-Query Modelling → User Interface and System Architecture Implementation

RESULTS

The SVD++ model achieved average Root Mean Square Error and Mean Absolute Error of 3.1226 and 2.6866 respectively. In comparison to other baselines it has obtained the lowest RMSE and MAE values, hence making it the most efficient filtering model to apply. The AR application obtained on average a distance variance of 130 cm and 150 cm for image and model targets respectively, a 270 degrees of rotation variance for both targets, and an average occlusion variance of 0.55% and 0.64% for image and model targets respectively. The system obtained on average positive qualitative results via user-feedback along with recommendations on how it may be further improved.

CONCLUSIONS AND FUTURE WORK

The application may be further improved by applying location based augmented reality to precisely augment information in specific locations. Explainable AI may help in interpreting the A.I. models applied which may help keep transparency with the users. Interactive AR may be further developed thus enabling the user to interact with real world object through the application. The results obtained are not surprising and are indeed promising, highlighting the fact that augmented reality can be applied to the real world using the techniques mentioned in the aim. It was thus beneficial to achieve successfully the results. However, one should not ignore or overlook the fact that there will always be room for improvement and innovation.

REFERENCES

1. Book 1
2. Research paper
3. Paragraph A
4. Section B