

# Architecture Of A Digitally Enabled Adaptive Solution Supporting Ageing Workforce With Vision Deficiencies\*

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**Abstract**— The aim of this work is to present the architecture of the See Far solution. See Far is a digitally enabled adaptive solution supporting the ageing workforce with vision deficiencies to remain actively involved in their professional life, helping them to sustain and renew their work and personal life related skills and support independent, active and healthy lifestyles. The See Far solution consists of two components: (i) the See Far smart glasses and the (ii) See Far mobile application.

## I. INTRODUCTION

According to World Health Organization (WHO) 2.2 billion people globally, mainly over the age of 50 years, have a vision impairment (VI) or blindness. VIs are well-known risk factors for social withdrawal and depression, they have a serious effect on a person's quality of life [1]. To overcome these issues, recent advancements in technology led to the development of assistive wearable devices, gaining the interest of the users. Smart glasses are a representative example of such wearable devices. The current study presents the architecture of the See Far solution which is a digitally enabled adaptive solution supporting the ageing workforce with vision deficiencies (Diabetic Retinopathy, Age related Macular Degeneration, Glaucoma, Cataract, Presbyopia) and the functionalities and recommendations that provides to the end user.

## II. SEE FAR SOLUTION

The architecture of the See Far solution (Fig. 1) includes five basic elements: the unobtrusive AR glasses; a tethered Android-based processing unit; the smartphone; an attachable ophthalmic camera; and the cloud environment.

The See Far Smart Glasses integrate information about the daily views and behaviors with the analysis performed by the corresponding applications, the See Far mobile application conducts an analysis of possible vision impairments and uses this information to adapt the daily life views to the user's

condition; in this sense it's also included a special support to the user's lifestyle. The 'core' functionalities of the system are: monitor vision impairments through the attachable ophthalmic camera and AI algorithms, filter the view of the user (magnification, contrast enhancement, colour filtering etc.), highlight obstacles/hazards, support indoor and outdoor navigation, provide healthy lifestyle recommendations based on the personalized profile of the user. Some indicated mockups, that have been developed for an Android mobile phone supporting AR Core, are presented in Fig.2.

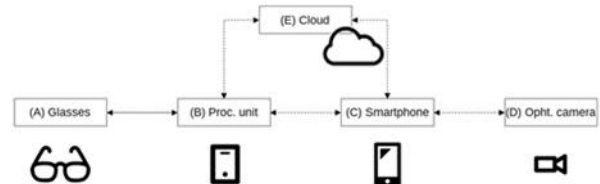


Figure 1. General architecture of the See Far solution.

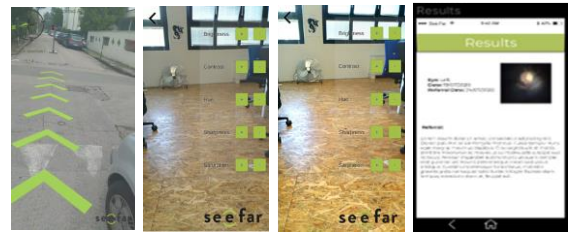


Figure 2. Outdoor navigation, Color filtering, Disease monitoring mockups.

See Far smart glasses combine the advantages and functionalities of the market available devices and move one step forward. They recognize the time and the type of the support that the user needs and activate accordingly the functionalities.

## REFERENCES

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