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WEKIT - Wearable Experience for Knowledge Intensive Training

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Abstract

This poster introduces European commission funded H2020 project called WEKIT - Wearable Experience for Knowledge Intensive Training. This three-year project has left two years and it will produce a WEKIT platform which exploits Augment training in situ with live expert guidance, a tacit learning experience and a re-enactment of the expert, in knowledge-intensive environments. Project has three industrial cases: (1) Aircraft maintenance: exploiting Augmented Reality and Wearable Technology for inspections, decisions making and safety (2) Healthcare: exploiting Augmented Reality for improving innovation in technology and responsibility in healthcare applications for medical imaging; and (3) Space: exploiting Augmented Reality and Wearable Technology for astronauts training and for supporting the assembly integration and test of payloads and sub-systems. The WEKIT platform will be tested together with end-users with iterative development loops.

Categories and Subject Descriptors (according to ACM CCS): H.5.1[Information Interfaces and Presentation]: Artificial, augmented, and virtual realities, I.2.6 [Learning]

1. Introduction

Wearable Experience for Knowledge Intensive Training (WEKIT) is a project funded by the European commission under H2020 programme. The project aims to advance training in knowledge-intensive environments where effective decision making, often in new situations, has high impact on effectiveness in production.

In the project, we aim to build on multi-discipline research (e.g., human-centred design integrates cognitive models, ergonomics, understanding of worker's wellbeing) to accelerate how we identify, acquire and exploit skills valued by industry. We use Augment training in situ with live expert guidance with capturing tacit learning experience with Wearable Technology (WT) and a re-enactment of the expert with Augmented Reality (AR). We plan to get high take-up by early adopters (e.g., in manufacturing). We bring learning content and technical documentation to life via task-sensitive AR. We also aim to make final products flexible for workplace integration via industry-standard repositories and toolkits.

2. Objectives

The project is to build and test a smart and AR-based *WEKIT technological platform* and an industry-focused WEKIT learning methodology, then to share our methods and research findings widely and make them part of the repertoire of Europe's communities in Technology-Enhanced Learning (e.g., content developers, trainers) and end-users (e.g., in factories). We see this as the basis for collaborative development and sharing of effective solutions to perennial problems that learners and workers face (e.g., finding that expensively-acquired knowledge was obsolescent when first learned and is now out of date and valueless, so cross-training is needed; discovering that critically-important knowledge of emergency procedures has been forgotten because it is rarely needed and no fast-refresh path currently exists).

We plan to use our prototype in testbeds for filling EU-wide competitiveness gaps via dynamic optimization and deployment of a new form of experiential learning, re-invented to take advantage of the affordances of new and recent forms of AR, WT, Technology-enhanced Learning, and Personalization of experience.

Projects sub objectives are:

Obj.1. to develop a conceptual framework for capturing workplace experience and combining it with technical documentation, we will be testing in the field of vocational training using AR and WT,

Obj.2. to evaluate the pros and cons of capturing workplace experience, from the viewpoint of industry and the learner,

Obj.3. to develop a vendor-neutral technological platform, 'The WEKIT technological platform', using an open, distributed architecture, open standards, and open licenses,

Obj.4. to design and evaluate a prototype,

Obj.5. to overcome fragmentation in and between research and practice through the creation of a roadmap by the WEKIT consortium together with the community of stakeholders.

3. Industrial cases

The WEKIT technological platform and training methodology will be tested and evaluated in three Industrial cases: (1) Aircraft maintenance: exploiting AR and WT for inspections, decisions making and safety; (2) Healthcare: exploiting AR for improving innovation in technology and responsibility in healthcare applications for medical imaging; and (3) Space: exploiting AR and WT for astronauts training and for supporting the assembly integration and test of payloads and sub-systems.

3.1. Aircraft domain

The aircraft domains end user is Lufttransport from Norway. They have been identified more detailed three use cases: (a) Complex task: Engine rigging in hangar (see Figure 1), (b) Non complex task: Brake wear check, and (c) Pre-flight inspection.

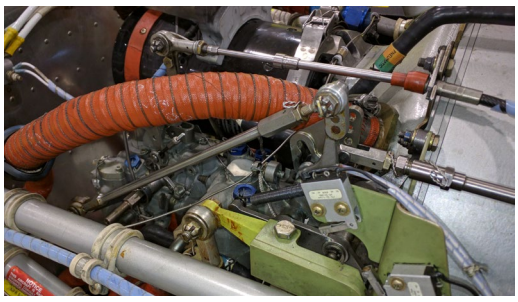

Figure 1. One of the aircraft use case: Engine rigging in hangar

3.2. Health domain

The health domains end user is EBIT from Italy. They have been identified more detailed three use cases: (a) Health Care Professionals – Doctors, Physician, Nurses and Clinical Engineers, (b) Augmentation of the virtual patients, and (c) Equipment Manufacturer Technicians (See Figure 2).

Figure 2. Healthcare use case

3.3. Space domain

The space domains end user is ALTEC from Italy. They have been identified more detailed two use cases: (a) Astronauts training – to train an astronaut for an activity that will be executed during the astronaut mission on the ISS, and (b) Maintenance on Mars Rover – to control that everything is working correctly before a mission (see Figure 3).

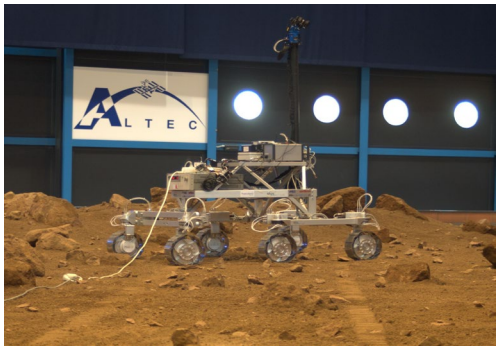

Figure 3. One of the space use case: Maintenance on Mars Rover

4. Next steps in the WEKIT system development

WEKIT system development will be done on iterative loops. The first version of the system should be ready by end of 2016. Based on feedback system will be updated and future developed for next developed loop. Final system will be tested together with end-user with use cases, which are introduced in section 3.

Acknowledgements

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