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Augmented Reality in Engineering Education - Providing students with industrial skills

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***Abstract* — Augmented Reality (AR) has developed rapidly in recent years and it is about to become a mainstream technology. Students will most likely face AR when they start working in industry after graduation. This underlines the need to increase awareness of AR among students and lecturers to enhance. In this workshop an introduction to AR as a technique, it's application areas and demonstration of the tools will be performed. Tools that will be used in order to communicate via AR are smart glasses, mobilephones, Ipad and computers. The workshop will also include movies to demonstrate use cases from industry. Participants will get the opportunity to conduct laboratory tasks that will show advantage with the technique.**

lab tasks, augmented reality, systematic review, industry skills

I. Introduction

DIGITALIZATION in engineering education, especially using emerging technologies as Augmented Reality (AR) is still not meeting the expected industrial needs. To close this skills gap, and to also invest in future skills AR is becoming increasingly more accepted in engineering education [1]. Since there are various AR applications, the assessment criteria for adoption of AR also appear diverse, which makes it difficult to choose proper criteria to evaluate the effectiveness of AR. To better understand how to approach and set up individual student tasks it is useful to be familiar with apects that drive cognition level.

II. Workshop: Purpose

The paper drives on getting participants to get familiar with AR and ways to interact through easy hands-on excercises with students. Based on review of assessment critera in engineering education [2] this workshop will emphasis notions from Bloom's taxonomy to leverage participants understanding, i.e. cognitive levels by exploring alternatives ways to test and experience augmented reality.

III. Workshop: Scientific connection

For the purpose of the workshop, demonstration and active learning methods is used. In the general education area, the assessment criteria are mainly directed to the learning performance of students. Past research has explored the use of digital prototypes as a mean for learning cross a variation of engineering contexts [2]. With adoption of AR, a new stress level for cognitive knowledge is introduced that put pressure on assessment procedures, to determine 'what is really learnt?' [4-7]. The uncertainties of the effects provide contradicting results from past studies with indications to actually take away cognitive stress by making clarification to otherwise complex reasoning and explanation dramatically more easy [8], [9].

IV. Workshop: Target Group

- Teachers or faculty employees who want to apply AR in engineering education;
- Teachers or faculty employees who are interested in digitalization in general and immersive technology in particular;
- Context independent life-long learning;
- Recruitment professionals from industry
- Student representatives

V. Workshop: Method & Results

The workshop builds on active learning so that participants will get hands-on experience to test out the functionality of AR. Participants will experience AR through a set of easy access and funny lab stations. The barriers are kept to a minimum to create a broad interst and open up for reflection for all, indepently of past experiences. The aim of this workshop is to create AR awareness, understanding of the tools, and application areas as use cases from industry will be presented.

VI. Workshop: Participants

We have set an upper limit to 30 participants (a maximum of 10 people/group) as there will be 3 moderators on sight to support participants at each station.

1. Participants will be given an introduction to AR and use cases from industry and engineering education.
2. Participants will be divided into groups to test for themselves a specific AR activity.
3. Participants will be discussing levels of understanding based on performed AR lab tasks.
4. Ws-leaders closing discussion and summarize experiences.

Time spent using the AR tools performing lab tasks will most likely be recorded for research purposes. Workshop leaders will be active in facilitating group discussions and keep track of progression. All input and proposals to enhance the workshop through constructive feedback is more than welcome (during and at the end). Opportunity for systematic feedback in order to make adjustments and improvements based on reflections will be provided at the end of the workshop.

References

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