



A Seminar Presentation on

A conceptual model of augmented virtual and reality in cadet training

Under The Guidance of

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Presentation Outline

1. Introduction

- **Problem Statement**
- **Overview**
- **Motivation**
- **Objective**

2. Literature Survey

3. System Architecture

4. Algorithm / Methodology

5. Result / Comparison Analysis

6. Applications

7. References



1. Introduction

Problem Statement:

A conceptual model in the education of the cadets trading which is necessary to be transferred to the cadets by AR and VR.



1. Introduction

Overview of Problem Statement:

In the education of the cadets, some issues have been observed acknowledged, particularly the issues of defining the set of information which is necessary to be transferred to the cadets by AR and VR and the issue of detecting feedback expressed through the learning outcomes previously acquired.

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1. Introduction

Motivation

- As in the process of education and training of cadets, it becomes difficult to acquire theoretical knowledge as well as practical training. So to make it easy an AR conceptual model is designed and it shows a complex realistic system of **presentation of military equipment**. The development of the application prototype is described and the user testing of the prototype with cadet students is accurately elaborated.



1. Introduction

Objectives

Through digital communication in the educational process, its stakeholders, professors and students, become creators of new information practices, which involve modern technologies augmented reality (AR) virtual reality (VR). The research objective was aimed at detecting AR and VR information concepts important for determining students' digital intelligence in the digital creativity domain.



1. Introduction

Scope (If applicable)

The obtained research results present basis for an AR / VR conceptual model to be further defined, that will contain set of abstract elements, relationships, and information that depict a **complex real cadet training system**.

2. Literature Survey

Name of paper	Authors	Working	Merits	Demerits
1. Serious Games - Communication Aspects of VR Cadet Training Information Model	1) Adranko Tuta 2) Ljerka Luić	The Army is an institution that seeks to maintain preparedness and ability to act through the implementation of training, i.e. field training within all military branches. For the purpose of carrying out the training as successfully as possible, it is necessary to prepare and plan it in the best possible way in order to achieve expected training outcome.	Advantage of this type of training is safety and the absence of risk. it only requires maintenance and upgrades when the need arises.	In virtual reality, it is crucial that cadets perceive that they have the necessary protective clothing intended for this work (helmet, protective suit and gloves).

2. Literature Survey

Name of paper	Authors	Working	Merits	Demerits
2. Military Applications of Augmented Reality	1) Mark A. Livingston. 2) Lawrence J. Rosenblum 3) Dennis G. Brown 4) Gregory S. Schmidt,	Augmented reality (AR) is helping military forces evolve MRO by superimposing digital data, like step-by-step service instructions, into a user's real-world view—so they can visually identify service needs in 3D.	<ul style="list-style-type: none"> • More accessed mission rehearsals • Safer training environments • Terrain diversity and customization • Real-time targeting aid • Enhanced spatial awareness • Engaging in mission planning. 	The disadvantages of augmented reality include bulky and expensive headsets with a limited field of view (FoV), security concerns when AR data is manipulated to influence worker decisions, a high and expensive learning curve to use, and a lack of truly precise spatial location systems for AR objects.

2. Literature Survey

Name of paper	Authors	Working	Merits	Demerits
3. Enhancing Military Training Using Extended Reality: A Study of Military Tactics Comprehension	<ol style="list-style-type: none"> 1. Michael W. Boyce 2. Robert H. Thomson 3. Joel K. Cartwright 4. David T. Feltner 5. Cortnee R. Stainrod. 	<p>In this method different process are involved which are:-</p> <ol style="list-style-type: none"> i. Extended Reality Displays in the Military ii. NASA Task Load Index iii. System Usability Scale iv. User Experience 	<ol style="list-style-type: none"> 1. Increased user engagement 2. Higher knowledge retention 3. Reduced (operational) costs 4. Train as often as necessary 5. Training in a safe environment 	<ol style="list-style-type: none"> 1. High Costs 2. Potential Health Hazards 3. Flexibility Deficiency

2. Literature Survey

a	Authors	Working	Merits	Demerits
4. A Virtual Reality Exposure Therapy Application for Iraq War Military Personnel with Post Traumatic Stress Disorder: From Training to Toy to Treatment	1 Albert Rizzo 2 Jarrell Pair 3 Ken Graap	The method involves:- i. Post Traumatic Stress Disorder ii. The Full Spectrum Virtual Iraq PTSD Therapy Application iii. Scenario Settings iv. User Perspective Options	The ability to view an artificial environment as opposed to imagining or waiting for real life exposure to adverse stimuli, allowing faster access to practicing coping skills. Additionally, virtual environments are customizable and can be tailored to suit unique needs of the individual.	1. Long-term therapy 2. Difficult to work through traumas 3. Difficult to put into practice 4. Isn't highly-intensive 5. Not a one-size fits all approach 6. Short-term pain

2. Literature Survey

Name of paper	Authors	Working	Merits	Demerits
5. A Controller-Based Animation System for Synchronizing and Realizing Human-Like Conversational Behaviors	1. Aleksandra Cerekovic 2. Tomislav Pejisa 3. Igor S. Pandžić	The system's architecture is based on hierarchical controllers which apply preprocessed behaviors to body modalities. Animation database is feasibly extensible and contains behavior examples constructed upon existing lexicons and theory of gestures.	1. Allow modeling of complex communicative utterances, which include verbal and non-verbal behavior 2. provide intuitive high-level mechanisms for character motion control 3. feasibly extensible with new animations	1. Difficult in develop efficient methods for solving PBA . 2. PBA in real-time applications and games gets complecated. 3. PBA affect the evolving augmented, mixed, and virtual reality technologies.



3. System Architecture

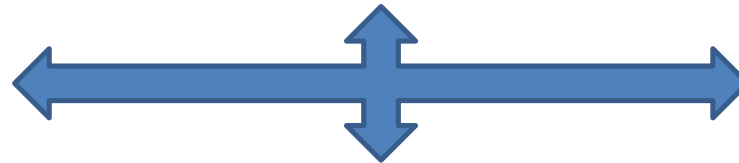
Data I/O

ABM (as built
file manager)

DPM (DXF
plan manager)

CC (camera
commnication)

PTZ Camera
Router 3G



User interface
AR CAD



SICURA
Engine

SICURA Software System
Architecture

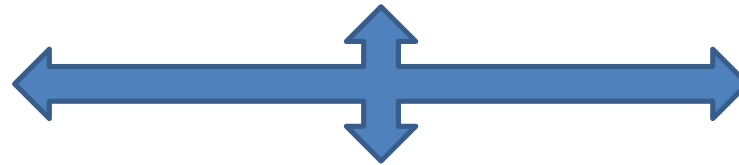


Image
analyzer

Measure &
annotation

Background
calibration

Contour detection

2 points distance poll-linearea

4 points
calibration

Straight lines detection

Text, geometry & photo annotation

PTZ camera movement



4. Methodology

In System Architecture of augmented reality there are many components which we have to take to complete this system architecture: Background, Scene navigation in AR-CAD, Dynamical image interaction for AR-CAD, Hardware description like PTZ network camera, AC voltage stabilizer, crane and Software description like “Image analyzer”, “Measure & annotation” and “Background calibration”- implement the system functionalities. Data Input/Output modules, Image analyzer, Measure & annotation tools.



5. Result / Comparison Analysis

By comparing other papers, this paper give best way of Conceptual model of Agumented reality in Cadet Training, This paper gives the all the Components to prepare trainings of cadets in the military, navy and airforce.

6. Application

Application: (if Applicable)

Based on the obtained results, an AR conceptual model was designed and it shows a **complex realistic system of presentation of military equipment** in the process of education and training of cadets. The development of the application prototype is described and the user testing of the prototype with cadet students is accurately elaborated.

7. References

1. I. Gape et al. "A Serious Game VR Prototype for Learning about Military Units based on Unity Platform (project report)", University of Zagreb Faculty of Electrical Engineering and Computing, 2018.
2. vana Ivanda et al. "An AR Prototype for Military Academia (project report)", University of Zagreb Faculty of Electrical Engineering and Computing, 2019
3. P. Antolovic, "Application of Virtual Reality in the Military Domain," BSc Thesis, University of Zagreb Croatian Military Academy "Dr. Franjo Tudman", 2018.
4. A. Rizzo, M.J. Roy, A. Hartholt, M. Costanzo, „Virtual Reality Applications for the Assessment and Treatment of PTSD“
5. E. Malbos , L Boyer , C. Lançon, „Virtual reality in the treatment of mental disorders“, (article in French) „L'utilisation de la réalité virtuelle dans le traitement des troubles mentaux“ (, La Presse Médicale, Volume 42, Issue 11, November 2013, Pages 1442-1452

Question and Answer

Thank you !!!