UNIVERSITY OF GENOA
DEPARTMENT OF INFORMATICS, BIOENGINEERING, ROBOTICS AND SYSTEMS ENGINEERING
MASTER'S PROGRAM IN BIOENGINEERING

Thesis Project Form

Title (tentative): AR Assistant for MassIve Hemorrhage Control training

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Description

Motivation and application domain

Massive hemorrhage is the first cause of preventable death in trauma. Anti-hemorrhagic devices, also known as tourniquets, often let the injured reach the hospital alive, if properly used. However, an improper application results in complications. In this context, Augmented Reality (AR) can support healthcare training. However, its use is challenging for 2 reasons: the tool should be simple, affordable, and easy to use by non-technical users; the content of the training should be personalized.

General objectives and main activities

Starting from a proof of concept of an AR System for nonprofessional massive limb haemorrhage training, the goal of this project is to design and implement a novel AR tool to provide personalized training and assistance for the management of massive haemorrhages in pre-hospital settings. The system would provide personalized multimodal cues in real time, according to the level of expertise and interaction of the trainee.
In particular, the objectives of this work can be summarized as follows:
- Develop a novel AR tool's logic and software architecture that can assist and train healthcare providers during time-critical emergencies. This part will be done in collaboration with clinicians to define clinical cases to be implemented and define the main features of the system
- Allow the system to adapt to different levels of expertise
- Integrate the tool with dialog-based interaction features.
- Evaluate the system with tests involving inexperienced users and healthcare providers with different levels of expertise

Training Objectives (technical/analytical tools, experimental methodologies)

- Analysis of the existing models and tools
- Design and development of the base functionalities (i.e., training scenarios, virtual objects)
- Personalization of the training, with the definition of a basic adaptive module and a conversational agent)
- Definition of the experimental protocol
- Experiments with clinicians and/or people without medical background and data analysis

Place(s) where the thesis work will be carried out: Joint lab for emerging technologies in simulation at SimAv; Laboratorium

Additional information

Maximum number of students: 1