



# AR Visualization and Interaction of Patient data in Intensive Care Unit with Hololens 2

Project Management and Software Development  
for Medical Applications

## General Info

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## Project Abstract

This project aims to use augmented reality (AR) techniques to help clinicians access and analyze patient data more efficiently and intuitively.

## Background and Motivation

ICU patients are continuously monitored by different medical devices, where the measurements are displayed on their respective screens. This makes it time-consuming and complicated for clinicians, when they want to access and compare data from different sources. Currently, we are able to obtain real-time bedside patient data from a patient monitor, a respirator and an infusion system. In this project, your task is to integrate all the data together and design the visualization and interaction method to assist the data inquiry and analysis of medical staff. Considering the need for different data of physicians and nurses, profile-based data inquiry and visualization is also another wanted feature.

## Student's Tasks Description

You will develop with a Microsoft Hololens 2 to visualize and interact with patient data, including patient static information, high-frequency waveform data, periodically and aperiodically recorded medical events. You will apply AR methods to enhance the visualization, which includes

recognizing objects/markers and aligning augmented objects to the real world. We provide you with the chance to work closely with medical staff and design the UI interface based on their needs.

## Technical Prerequisites

You will use a Windows 10 OS configured with Unity. Mixed Reality Toolkit (MRTK) for the development. For the programming, you need to import Mixed Reality Toolkit (MRTK) into Unity and the scripts are in C#.

## References

- [1] Kimmel, Simon, Vanessa Cobus, and Wilko Heuten. "optiARe-Augmented Reality Mobile Patient Monitoring in Intensive Care Units." Proceedings of the 27th ACM Symposium on Virtual Reality Software and Technology. 2021.
- [2] <https://docs.microsoft.com/en-us/training/paths/beginner-hololens-2-tutorials/>
- [3] <https://docs.microsoft.com/en-us/windows/mixed-reality/design/interaction-fundamentals>