

FACULTY MENTOR

Suresh, Preetham

PROJECT TITLE

Digital Manikin (Mixed Reality Application)

PROJECT DESCRIPTION

Simulation Training is an important step on learning medical procedures. Students learn basic skills on a low-stakes environment that they can later transfer to life-threatening situations. Unfortunately, simulation manikins are fairly limited and are unable to simulate a plethora of environments. This project seeks the use of Augmented Reality / Mixed Reality to extend what a manikin can do.

Using a device such as MagicLeap ML1, the student should develop an application for assessing a manikin's health through a digital stethoscope. The device will track the user's hand position through ML1's controller so that it knows what parts of the body are being inspected. With that information, the application should generate the correct audio track that simulates a heart beat at that position. In short, the student will:

- take position information from tracking system for virtual stethoscope or ultrasound to be represented via an AR headset
- play audio track based on position in space when virtual stethoscope contacts manikin
- for future step: display computer generated ultrasound by converting slice from reference database into stylized ultrasound image

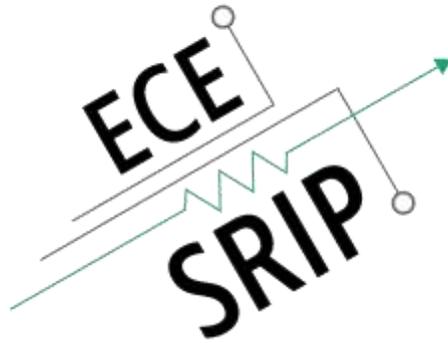
<https://drive.google.com/file/d/1bBEgdNwpav6LGSArLivqSCEfGjRPd3QS/view?usp=sharing>

INTERNS NEEDED

1 BS or MS student

PREREQUISITES

Basic understanding of Computer Graphics; Programming (C# or equivalent); Unity3D experience is preferred, but not necessary.



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PROJECT TITLE

Real time Labeled Ultrasound Reference

PROJECT DESCRIPTION

Learning anatomy is an involved skill that takes several trials and errors. Here in the Simulation Training Center, we are developing the next generation of medical training tools. One of these tools track an ultrasound probe in 3D space so that we can tell what parts of the body a user is scanning.

The goal of this project is to extend our tool by querying for similar ultrasound scans on a public database. This will allow us to label a scanned area, so that students can learn more about areas of newly scanned body without the aid of an expert nearby.

In short, the student working on this project will

- pull ultrasound position data from tracking system
- pull target slice from reference database

https://www.nlm.nih.gov/research/visible/visible_gallery.html

<https://www.visiblebody.com/anatomy-and-physiology-apps/human-anatomy-atlas>

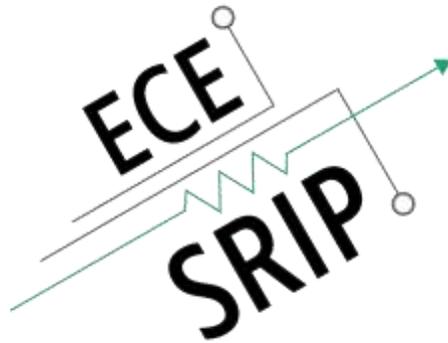
- display labeled cross sectional slice that is close in proximity to the slice being taken by the actual ultrasound

INTERNS NEEDED

1 BS or MS student

PREREQUISITES

Basic Machine Learning; Programming (C#, Python, or equivalent)



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PROJECT TITLE

Stream Vitals into EPIC

PROJECT DESCRIPTION

The goal of this project is to improve a simulation system so that we can teach students on how to report vital signs to an electronic health records (EHR) system such as EPIC.

The student working on this project will be responsible for:

- Pull vital sign data from simman (Simulation Manikin) software and convert into EPIC code to go into live chart
- EPIC data would need to go into TEST environment
- VS would be pulled from numerics on a controlling laptop (Laerdal patient monitor, or Gaumard UNI)

INTERNS NEEDED

1 BS or MS student

PREREQUISITES

Programming (C#, Python or Javascript)