A Computer Vision Based

Tracking Framework For Medical Training

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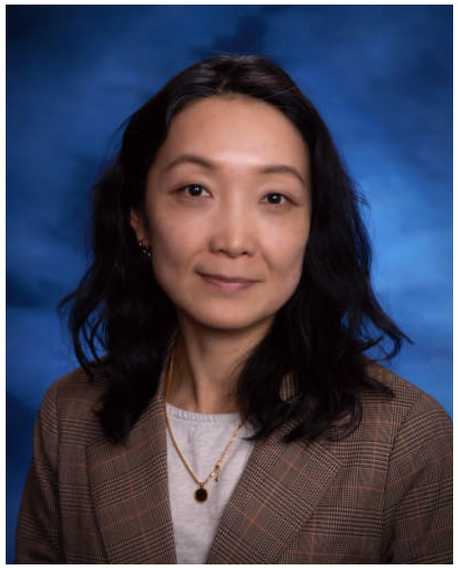
The Sixteenth International Conference on Advances in System Modeling and Simulation
SIMUL 2024
September 29, 2024 to October 03, 2024 - Venice, Italy

Bio of Bo (Beth) Sun, Ph.D.



- Dr. Sun currently is an associate professor in the Department of Computer Science at Rowan University, USA.
- She was also a visiting faculty at Center for Digital Visualization under the Computer & Information Science Department at University of Pennsylvania.
- In 2016 and 2017, she worked as a guest/visiting scientist at Computer Science Initiative at Brookhaven National Lab.
- Before joining Rowan, she was former (interim) chair of Department of Computer Science at Lincoln University and respectively an assistant professor at Dept. of Bioinformatics and Computer Science in University of the Sciences.

Bo (Beth) Sun, Ph.D.
Research Interests and Funding Sources

- Dr. Sun's current research interests focus on Immersive Visual Analytics, an innovative way to analyze large scale and multi-dimensional dataset for big data using immersive technology.
- Her research interests also include Visual Analytics and Simulation using Serious Gaming and Immersive Technologies.
- Dr. Sun’s research is mainly supported by US National Science Foundation, US National Institute of Health and US Department of Education.

Introduction

Tracking system commonly used in Medical Simulation

A: Magnetic tracking

B: Haptic Device

C: Optical Tracking

Problems and Challenges

Limited time access for trainees

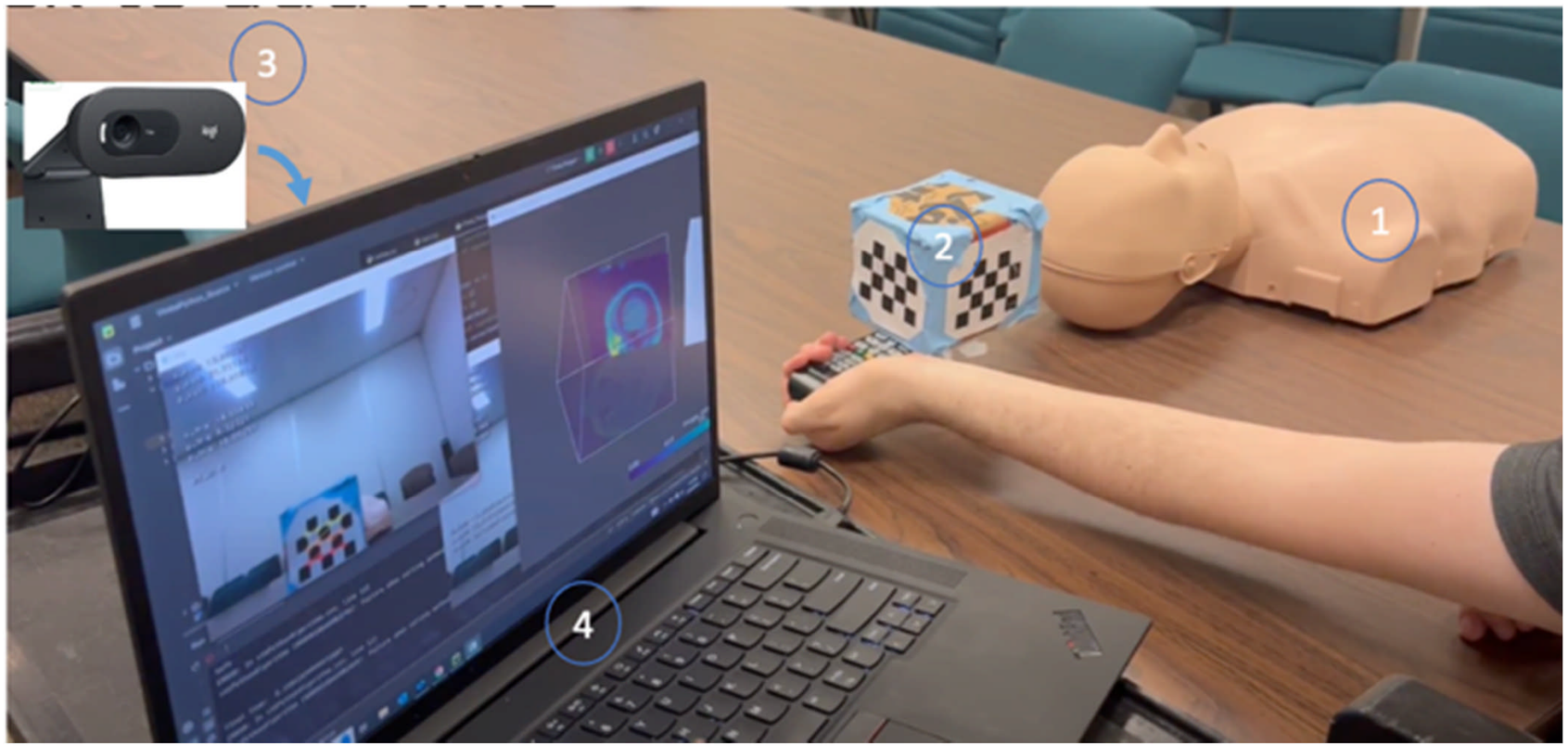
→Limited skills gained through the training

→Do not resolve medical malpractice issues

In the US, unintentional injury, including medical errors, kills more than 400,000 people annually

Goal: Avoid cumbersome tracking devices by using a computer vision technique, so that trainee can get trained anywhere.

Computer Vision based Tracking



1) Phantom; 2) Cubic Shape Marker Attached to A Mock Transducer; 3) Camera; 4) Laptop.

Tracking System

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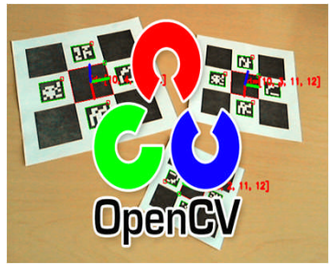

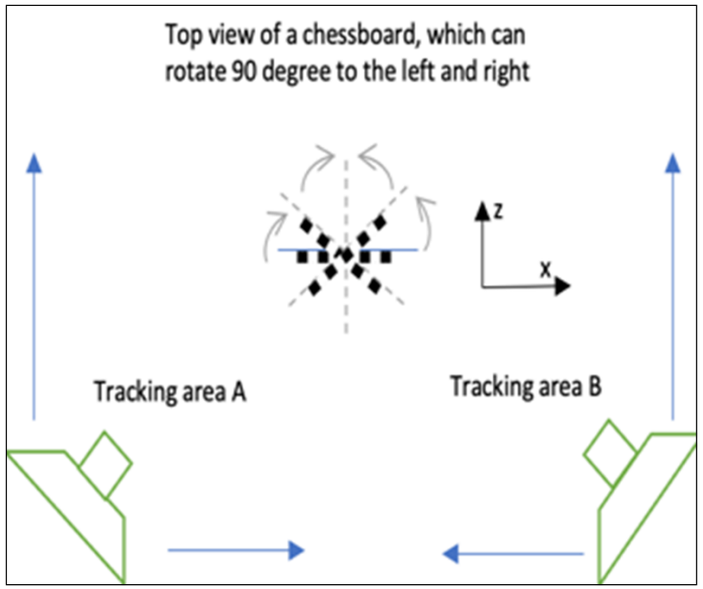

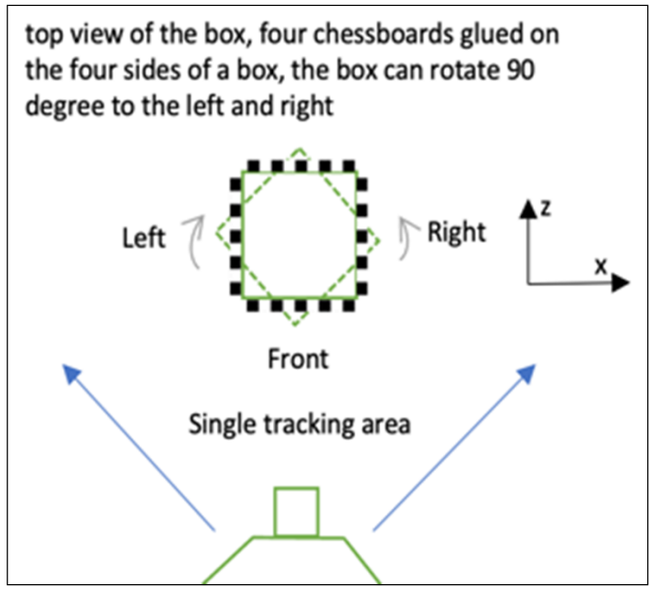

One Camera Tracking

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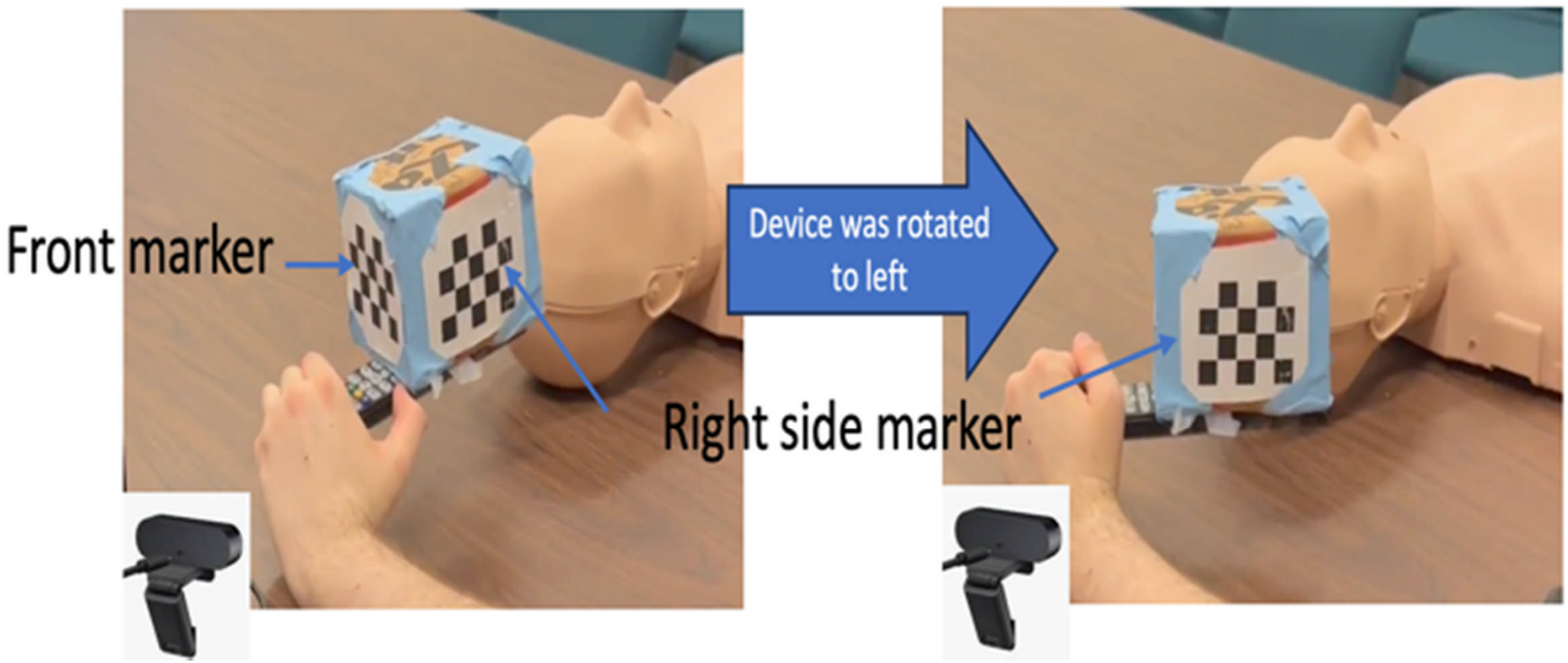
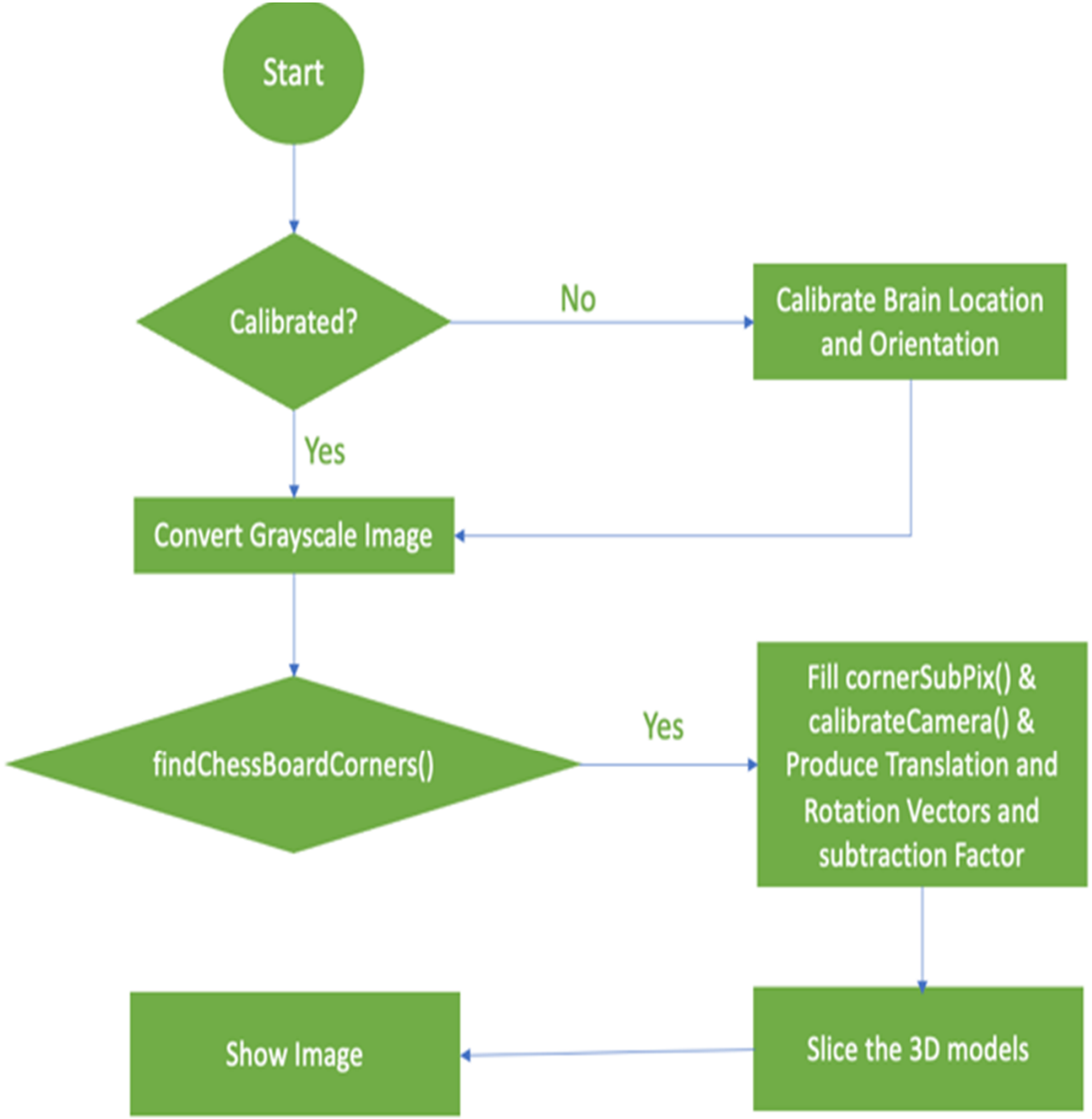


System Diagram

OpenCV resources



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Prototype: Cranial Ultrasound

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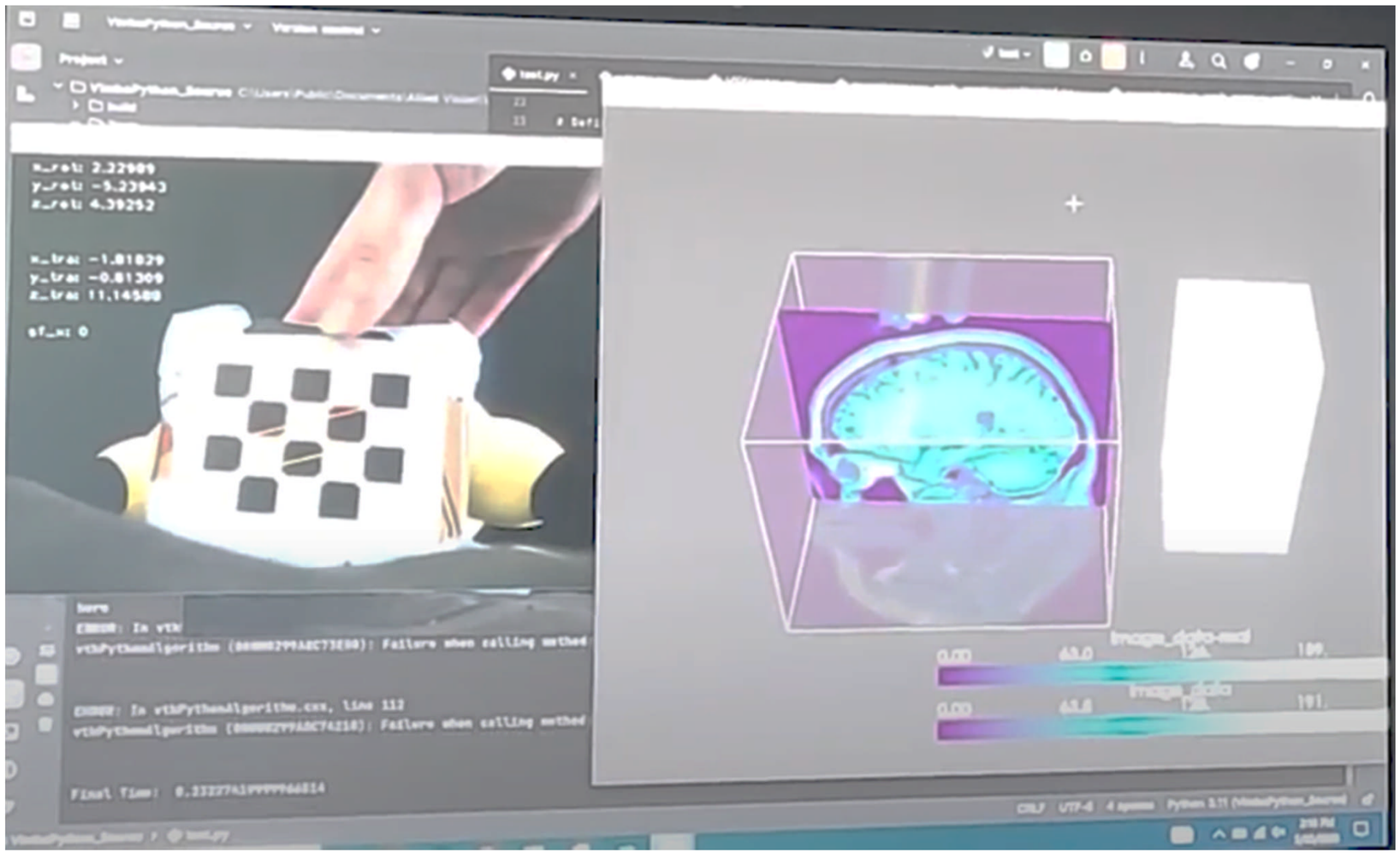

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- Any Questions pls email sunb@rowan.edu