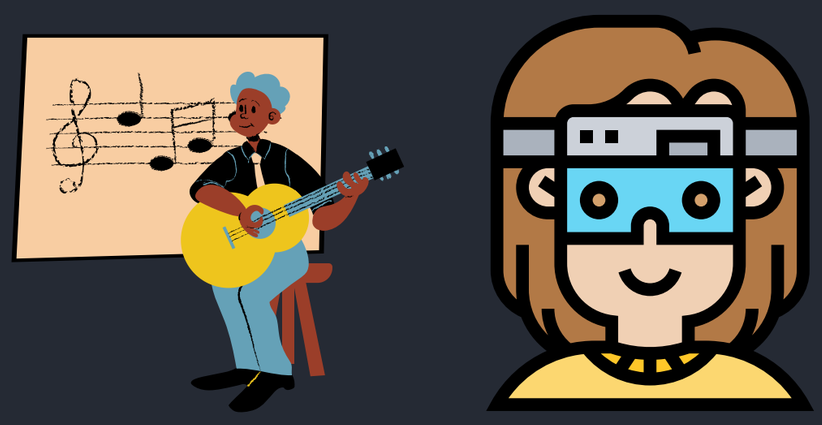
Harmony Vision

CMKL UNIVERSITY



1 Introduction

Learning and playing the guitar is an arduous process that requires the aspirant to juggle their attention between their fretboard, sheet notes, and strumming, in order to play a song at a competent level. This causes a difficulty cliff that leads to most amateur guitarists giving up on their endeavors. Our project aims to remove the memorization aspect of playing the guitar by providing “visual cues” as well as “haptic feedback” in order to tell the user where on the fretboard they should place their fingers and when they should strum, thus mitigating the challenges posed by the complexity curve.

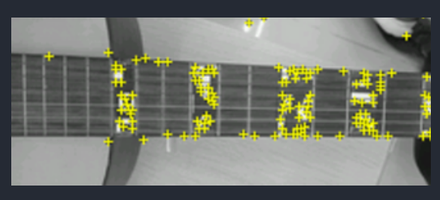
2 Methodology

Overlay

To streamline the learning process, our strategy entails implementing an AR solution, utilizing Microsoft’s Hololens headset. This technology will project cues directly onto the fretboard, thus reducing the user’s reliance on multiple visual indicators. The key to this implementation lies in accurately tracking the fretboard's relative position in relation to the headset's lens.

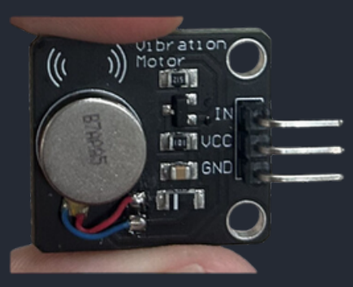
Tracking

To ensure precise guitar tracking, we integrated Vuforia’s library due to its compatibility and straightforward implementation. We have also attached customized markers onto the fretboard to enhance Vuforia’s tracking precision.



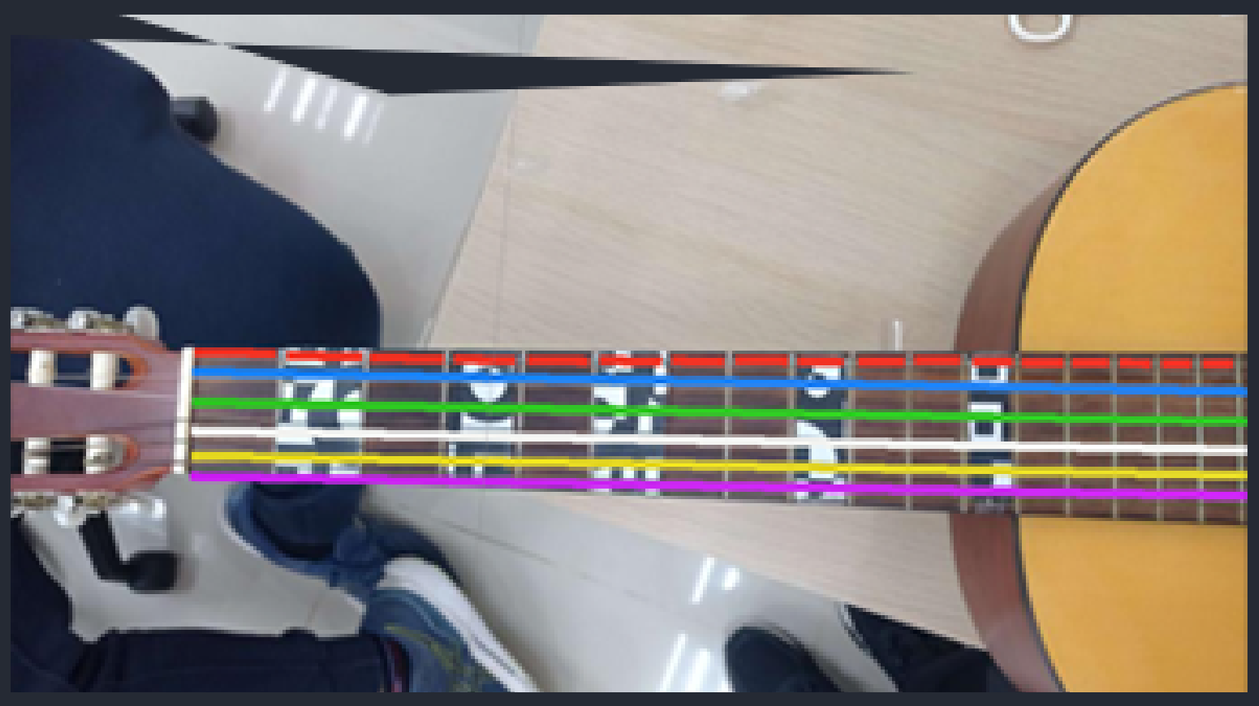
Rhythm

In order to help the user keep track of the rhythm, we implemented a vibration motor to provide the user with “haptic cues” reminding them when to strum.



3 Proof of Concept

We have created a proof-of-concept application that allows the Hololens headset to track a marked guitar and display visual cues on the guitar’s fretboard. However, stability and performance improvements are very much warranted due to the Hololen’s limited computing capabilities.



4 Contact

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