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Bachelor Thesis / Master Thesis

Wearable sensor-based detection of active fingers for interactive piano education

Task:

More and more interactive apps bring innovative experiences to piano education and enrich people's lives. Displaying scores, marking key positions, assisting rhythms, and judging the correctness of played notes through audio recognition enable teacherless/mobile individual e-teaching extensively. Among the many problems in this field that have not yet been solved by machine learning, identifying the fingers playing the keys, which is essential for abecedarian, can be assigned to the research of wearable sensor applications. On this issue, video-based recognition has many insurmountable shortcomings, such as location and angle sensitivity, security and privacy, and ease of use. By solving this topic through wearable technology, that is, successful active finger recognition, then, together with audio recognition, the practicality of piano-assisted teaching software will be pushed to a new height. Relevant literature has confirmed the feasibility of finger and interdigital gesture recognition.

Requirements:

- Good programming skills in Python
- Planning and organizational skills for small-scale data collection
- Ability to read and summarize a small amount of literature
- A love of music, and interest in computer-assisted amateur music life
- Interest and preliminary knowledge of sensors and biosignals (optional)
- Simple music theory knowledge, such as notes, chords, and intervals (optional)

When:

- As soon as possible

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