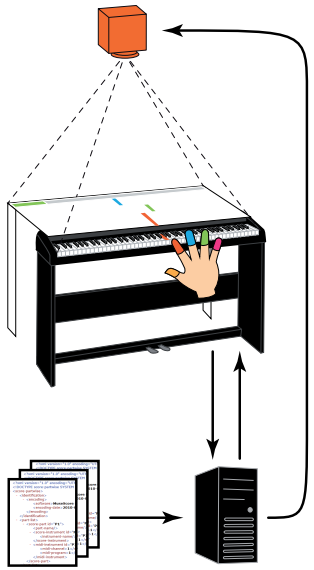

Figure 6: Prototype architecture.

music sheet notation high. The other two played no instrument and could not read music sheets.

First, participants were presented with our prototype's visualization, and asked to identify what they thought various visual features indicated. Subsequently, they were allowed to explore the prototype's modes one by one; participants were asked to practice a specific song until they felt comfortable enough to attempt the *Play* mode with a set speed. Finally, they were asked to fill out a questionnaire.

We were most interested in whether the provided fingering information was sufficient, and what scope of visual attention was adopted by the users. Regarding the former, the amount of finger information was deemed satisfactory by all participants; none felt overwhelmed by the amount of colours. Visual attention areas differed between participants. Half of them looked mostly at the piano keys, and indicated their visual scope to reach only 5–10 cm (approx. 2 notes) above the keyboard. The other half declared their visual scope to include the piano keys and about half of the extended projection area. All participants considered the preview to be adequate and not too overwhelming. While three out of four participants did feel overwhelmed during their attempt at the *Play* mode, they were also certain that they would do better given more time to practice.

Conclusion

The P.I.A.N.O. system offers assistance in learning to play piano without requiring any experience with traditional music notation. By circumventing the time necessary to learn the mapping from the sheet notation to the corresponding keys, users can concentrate on learning to play specific songs immediately, and soon begin to learn advanced techniques. Our proposed note representation encodes a note's key and duration, as well as indicates a variety of advanced playing techniques. We are currently investigating how to extend our notation further in order to match the complexity and expressiveness of traditional sheet music notation. Furthermore, we are planning two more extensive user studies to assess the learning support of our prototype and compare it to related systems.

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