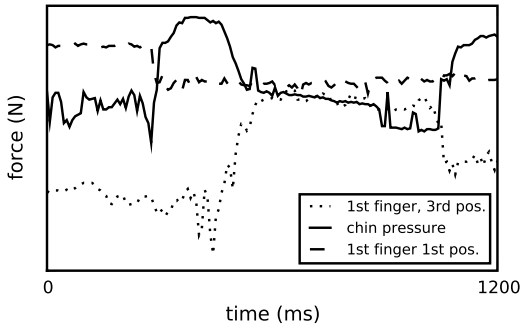

Figure 7: Typical real-time visual display of a transition between first and third position.

the timing between finger and chin rest, which is one of the most complex movements to learn and execute for beginners and to optimize for advanced students. The analysis can help the student to better understand the coherences of the correct timing and weight allocations between chin and left hand. The teacher sees, beside the latter mentioned coherences, the pressure and effort the student applies. Beside other parameters, this indicates a lot about the smoothness and well-being of the student.

5. CONCLUSION

The full potential of sensing and feedback supported violin tuition is only tapped in this article. We currently work on more, easier to use and cheaper sensors and we will extend the above mentioned possibilities. More advanced feedback methods and stand-alone solutions will bring new possibilities and simplification. The practical evaluation is going on and we find more and more useful teaching situation, where this technology is applied. Other instruments like string instruments in general, piano and wind instruments are considered as well.

The combination of the mentioned methods and setups with advanced data mining techniques is a further promising way of recognition of different playing styles, left/right coordination, cramping detection, and many more possibilities. This may open up useful tools for every-day exercising and teaching. Especially the pressure and force sensors offer many more possibilities for new music compositions in combination with simplified real-time interaction within electronic music environments.

6. ACKNOWLEDGMENTS

The work has been supported by CITEC – Center of Excellence in Cognitive Interaction Technology.

Special thanks to my violin students Stefanie Schirmer and Fabian Hanter.

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