

## Thinking outside the virtual box: Can we do feedback haptics better and cheaper?

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This talk will discuss how force feedback as commodity hardware suffers from a problem of pre-mature optimisation and pre-mature generalisation; engineers compete to develop devices in similar molds on axes of cost or quality as measured by highly technical metrics, usually succeeding in design devices that either under-perform or are too expensive, meanwhile waiting for that killer application to come along that will increase public interest and bring the cost down. I will propose that what is necessary currently is to re-think what the term feedback haptics means, divesting the word 'force' from the name for one thing, and to develop solutions for specific experiences and from specific perspectives, be it interaction design, art, or scientific research. I will suggest that the current small interest in force feedback in comparison with other HCI fields, together with a consideration for current trends within the 'maker' sphere, is an opportunity to take up a more DIY approach, as witnessed e.g. in robotics and electronics, to lower the cost of entry and to help fight obsolescence. This implies an effort to dissolve perceptions of haptics being difficult, unapproachable, and expensive. One avenue may be through creative use of actuation approaches that diverge from the standard solution of high-performance DC motors controlled in closed loop at high frequency, for which I will cover several alternatives; although on the one hand we should accept at this stage some quality loss to enable experimentation, I will argue provisionally that in the long run quality can be assured if it is measured by experiential and perceptual metrics instead of technical ones.