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# Physical Heart in a Virtual Body

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**Abstract**

In this video we present a special guitar that combines physical acoustic properties with virtual capabilities. A wooden resonator - a unique, replaceable piece of wood that gives the guitar a unique acoustic sound, will embody the acoustical values. The acoustic signal created by this wooden heart will be digitally processed in a virtual sound box in order to create flexible sound design. The project shows that traditional values can be embedded into a digital object.

**Keywords**

Guitar, Resonator, Craft, Virtual, Sensors, Acoustic, Digital Instrument, Music.

**ACM Classification Keywords**

H.5.5 Sound and Music Computing: Signal analysis, synthesis, and processing; Systems.

**Introduction**

Today's tools and instruments, whether musical or graphical, fall into two very distinct classes, each with its own benefits and drawbacks. Traditional physical instruments offer a richness and uniqueness of qualities that result from the unique properties of the physical materials used to make them. The hand crafted, construction qualities are also very important for those tools. In contrast electronic and computer based instruments lack this richness and uniqueness; they produce very predictable and generic results, but offer the advantage of flexibility: they can be many instruments in one. We propose a new approach to designing and building instruments, which attempts to combine the best of both. The approach is characterized by a sampling of the instrument's physical matter and its properties and complemented by a physically simulated, virtual shape. This approach to building digital objects maintains some of the rich qualities and variation found in real instruments (the result of natural materials combined with craft) with the flexibility and open-endedness of digital ones.

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