Expansive Technical Overview and Goals

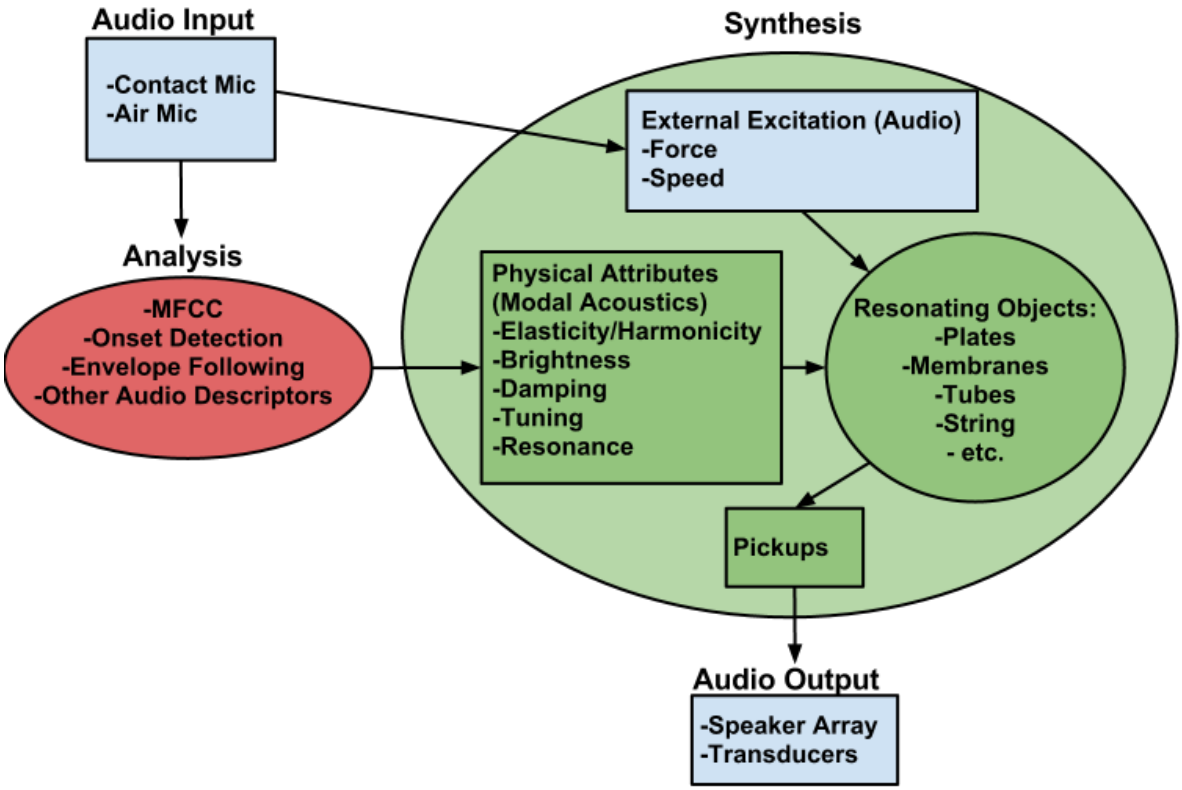
We explore diverse ways to map free, continuous movement to musical textures and sound. Some movements come from ordinary gesture or movement. We study how everyday gestures may become invested or charged with emotion or social meaning as players grow accustomed to the instrument's responsive quality. This nuanced approach allows us to create meaningful and playable mappings from gesture to sound relative to rich physical affordances. At the moment, in collaboration with various performers, we are refining a sequence of gestural instruments with which novice as well as expert players can develop rich, personal repertoires of gestural music. Some of these instruments may be worn as clothing and other may be embedded in everyday objects and environments.

Commonly established interactive systems capture gestures in the 20-60Hz range, within fragile system architectures that drop frames or gesture samples. However, newer application such as music, contemporary dance, gestural sound, and those integrating multiple sensory modalities need higher data rates and lower jitter than the legacy standards provide.

Encoding gestures in audio has the advantage of leveraging a high reliability signal path into computers (optimized because audio clicks are very noticeable) with high data rates (44.1-198kHz) and low jitter (better than 1nS). As well as transcoding gestures from haptics into acoustic energy sounding objects such as fruit, vegetables, the floor and the human body provide useful computational operations such as band-limiting, resonance, textural and spatial encoding.

By sonifying with microphones and realtime sound instruments the utensils and gestures of a chef, Tabletap symbolically charges everyday actions and objects in ways that combine the choreographer's and composer's design with the performer's contingent nuance. Tabletap replaces the design of interaction as discrete action-response by the composition of time-based media that can recalibrate themselves on the fly (within 30 frames, i.e. 0.6 ms under ordinary load), according to contingent action.
We are refining and combining these techniques with great engineer care so that the consequent bundle of techniques and software could be easily repurposed for many other scenarios. Therefore the final result, beside the artwork, is a finely crafted platform for performance that can be quickly re-adapted to any context established in the moment of performance or event together with the apparatus of expectation. We are already in conversation with partners that are waiting to further fund and incorporate within their context of interest (SAT FoodLab, Chicago AR Games, Digital Storry Telling Platforms, Goethe, CIRQU, Ars Elektronica, CNMAT, etc)

One way we have designed the continuous richness of potential computational response to non-schematized gesture is via an architecture that implements physical models coupled with acoustic sensing. (The figure below shows an example architecture which incorporates many fairly sophisticated sound analysis, mapping, and synthesis systems such as.)



In the video examples provided, you can witness how quickly effectively this sort of architecture can be re-adapted and coupled with various objects to create magical instruments, and objects that carry a strong sense of hyper physicality and organically welcome gesture and musical improvisation, expression for refined performance or naive entertainment alike. For example: the Eggplant-Gong, the Pine-cone-Mbira, the Balloon-Speech-Tabla, the Mortar-Pestle-Synthesizer, The Atmospheric-Knife-Sharpener, erc.

Our platform is being designed to maximize contextual, expressive, and gestural possibility of it's use. In "event-loop" programs, the design logic focusses attention on one discrete user action at a discrete time, which triggers a cascade of computer actions in response. The two agents in this design fiction, computer system and user, wait for each other at what we'll call the meso scale of a human act, paradigmatically that of making a selection among a small, discrete set of choices.

However in realtime systems like our time-based computational media environments, the flow of processing happens continuously, and as far as the human is concerned, concurrently with his or her continuous gesture. Thanks to our matter/media coupling strategies, already explained above, there is no turn taking, but only a natural interaction between gesture and enchanted matter.