Audio Visualization Description

For my audio visualization I would like to extend the ideas expressed in *Visiphone* to emphasize patterns of civil conversation to expose less than productive moments in group conversation. Whereas the salient patterns exposed in that existing work include ambient noise, silence, and "the dynamics and inflections of conversation," this visualization will focus on a specific subset of the latter.

In particular, I was inspired for this visualization by a recent meeting for an RSO that I lead. The conversation was beset by a large number of interruptions, injections, and erroneous dialogue between two partners, resulting in little progress in the discussion at hand and overly loud reminders to keep focused, hurt feelings, accusations of poor attitudes, etc. In lieu of proper parliamentary procedure, meetings have taken shape as free-form discussion within the boundaries of a pre-set agenda. The character of these meetings lends itself to great idea generation, but at a cost of precious time. If one were to accept that meetings are a hindrance to great human achievement, then the object becomes shortening the amount of time arm-waving and speaking over or during the speech of your peers.

The visualization would require input from unidirectional mics that filter out ambient noise and are attenuated to the voice of the mic'ed user. The reason will become illustrated below.

I begin by presenting the representation of speech as a simple graph of time versus the outline of a waveform of a user's speech:

![Figure 1: Single user speaking](image)

As figure 1 illustrates, the waveform outline allows the viewer to ascertain speaking patterns in a manner similar to reading a stock chart or an EKG. Generally the amplitude of the wave represents volume of speech and the valleys and peaks represent the delineation between words, phonemes, etc. The single outline is clearer and less cluttered than viewing the entire waveform. It should be noted that a proper waveform is essentially that of figure 1 reflected across the horizontal axis. The choice to reduce this is, again, to preserve the metaphor mentioned above.

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2. Adopted from the original joke: "The only thing keeping humankind from reaching its full potential is meetings."
I next present the representation of a dyad in conversation:

Figure 2: dyadic conversation

Juxtaposing the waveforms for two individuals reveals much about the dynamic of the conversation. Figure 2 both users attempted to speak at the same time, with the second user winning out. It then appears as the second user trails off, the audio space is filled by the first user’s speech.

Clearly, these represent a conflict in conversational behavior. I now introduce an element to provide further salience to this dimension:

Figure 3: overlapping points in conversation are highlighted

Figure 3 shows points in conversation where the users overlap as highlighted sections. While one can ascertain from the visualization in figure 2 when this occurs, the highlighting helps to emphasize this fact. The use of the color red provides a simple visual indicator that a breakdown in conversation has occurred in the form of interruption or prolonged interaction (e.g. more than an verbal indicator of agreement or understanding like ‘okay’ or ‘uh-huh’).

The use of highlighting does not distinguish between the interrupter and the interruptee. Arguably, it is everyone’s responsibility to maintain group dynamics and it is fair to highlight the entire slice of time. I introduce, however, an example of just the offending parties having their respective spaces
As distinguished from figure 3, only the points where multiple users try to begin speaking at the same time or the offending speaking party (i.e. not the person who is being interrupted) are highlighted. You’ll notice the first user’s short interjections are not highlighted - they may represent the interjections which I typified above or unsuccessful attempts to interrupt.

The overarching goal of this visualization is that the behavior of participants in group discussion where formal procedures are not necessary due to a smaller number of participants will be shaped in a positive direction.