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Interactive Musical Partner: A Modular Human/Computer Duo Improvisation System

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Musical Personality Settings (MPS)

Density of Events

Weights the decision making process that controls the ratio of sounding events to silent events.

Length of Events & Rhythmic Regularity

Work together to control sense of tempo and pulse. Rhythmic Regularity sets pool of duration proportions, and Length of Events sets factor that controls speed at which proportions are realized.

Listenerness

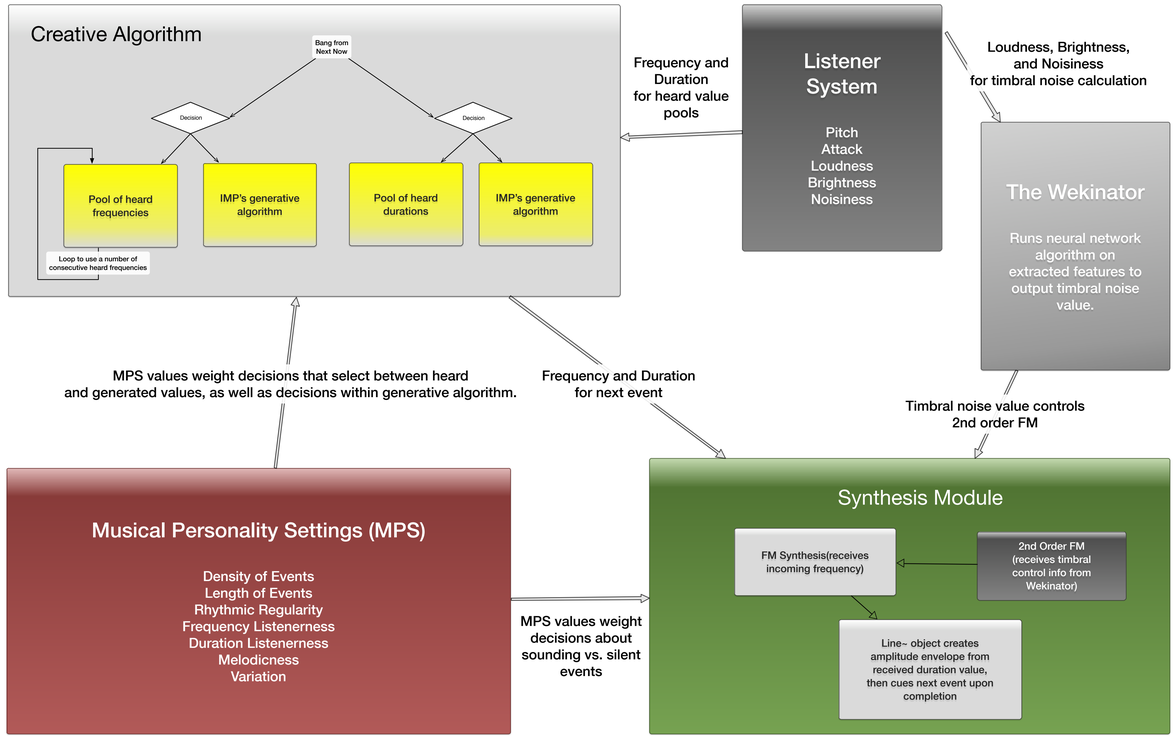
Listenerness controls how much IMP's output is influenced by what it hears from the human. There are separate listenerness parameters for pitch and duration.

Melodicness

Controls the pitch set from which IMP's creative algorithm chooses.

Variation

Controls the amount of random variation of the other parameters



Listener System

Extracted Features

IMP uses the `analyzer~` object, by Tristan Jehan, to extract audio features from the real-time audio input generated by the human partner. The five features used by IMP are: pitch, attack, loudness, brightness, and noisiness.

Pitch

Output as frequency in Hz. At each new onset, this value is sent to the heard frequency section of the Frequency Decider.

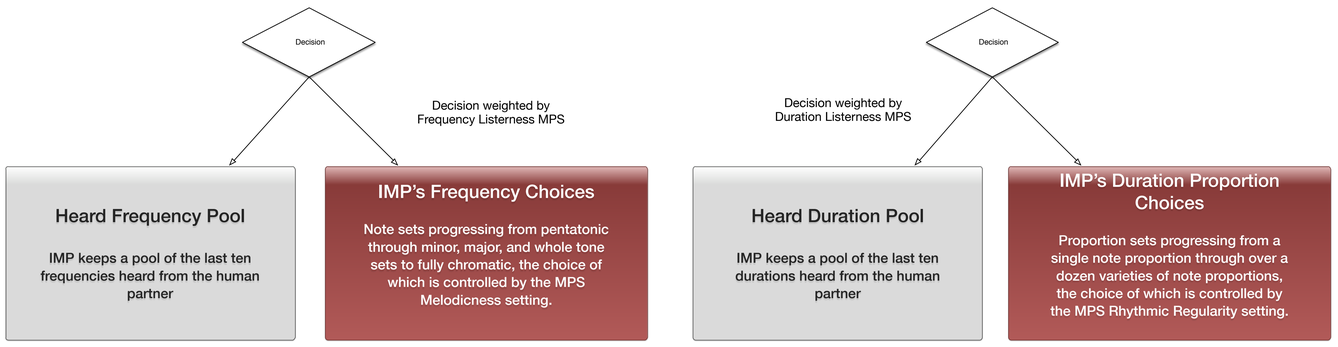
Attack

Each new onset triggers a new entry in the heard frequency and heard duration sections of the generative algorithm. The time between onsets, in ms, is stored as the most recent heard duration, and the ten most recent durations are kept as a running average that influences the Length of Events MPS.

Loudness, Brightness & Noisiness

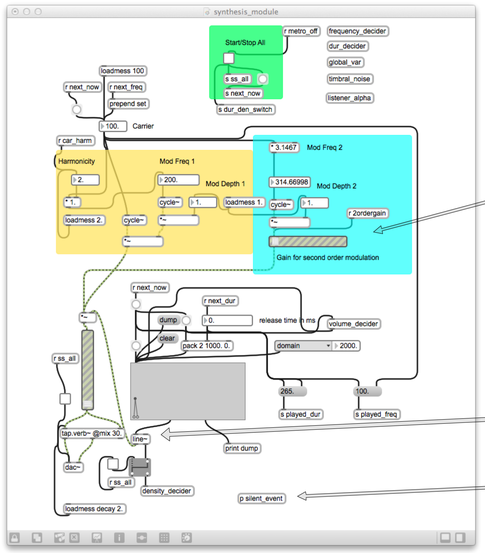
Used by the Wekinator to calculate value to be sent to Timbral Noise Module, which controls timbral variations of IMP's output.

Creative Algorithm



http://research.jeffalbert.com/imp

Synthesis Module



Gain that mixes in 2nd order FM controlled by value from Wekinator

line~ object that creates amplitude envelope and triggers next event

silent_event patcher passes time and bypasses synthesis, so silent events have all qualities of sounding events, except sound