

Computational Thinking and Music Performance

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The Big Picture

- *Everyone likes music*
- Most just listen, but *many* play:
- Music Merchants: \$8B, 5M instruments (US, 2006)
- Sound reinforcement: \$1.5B (US, 2006)
- Audacity Audio Editor (Dannenbergh & Mazzoni): 1M/month

- *Computation can enhance the musical experience by providing automated, live, musical partners*

The Performer

- Real-time performance synchronized to human musicians
- Assumes quasi-steady tempo
 - research: characterize tempo variation in human performance
- Uses foot-tapping to give the beat to the computer
 - research: interfaces and methods for tempo acquisition and cues
- Uses pre-recorded audio (20 instruments in real time)
 - research: high-quality, low-latency, time-variable, ensemble time stretching

The Performer in Concert

Video

Carnegie Mellon Jazz Ensemble + strings, directed by Dave Pellow, “Alone Together” arranged and conducted by Dr. John Wilson, strings recorded at Carnegie Mellon School of Music

Future Work

- Interface, interface, interface
- Sensing
- Display
- Computational Thinking and the Digital Music Stand
 - Tablet PC and smaller platforms (Kindle? Cell phones?)
 - Capture music notation as digital photos
 - Record all rehearsals
 - “Learn the music” for page turns, etc.
 - Feedback: location, intonation, cues