Interactive Sonic Arts
Final Project Proposal
Kieran Maraj

For my final project I am proposing an interactive instrumental system that includes an computational agent structured around the third of Pauline Oliveros' *Four Meditations for Orchestra*, *Interdependence.* I am imagining an agent that can act in either of *Interdependence*'s roles, sender or receiver, as well as have the ability to play in any of the original pieces' four variations:

Respond To	**Respond With**
Short sound	Short sound
Short sound	Short sound or long sound
Short sound or end of long sound	Short sound or long sound
Short sound or end of long sound	Short sound, long sound, or long sound with gliss

Table 1 - Four variations of Oliveros' Interdependence

The system I am proposing uses musical gesture as a key element (Godøy and Leman) with human input into the system will be primarily made through a digital drawing tablet. Gestures are fed into the system by a human performer for sonification, then stored in memory for recall, use, and transformation by the computational agent. This project is inspired by and borrows significantly from the GREIS system (Van Nort et al) - particularly in its use of drawing tablet as primary gestural interface as well as metaphors of episodic and semantic memory.

The system will have two types of memory - a running memory that consistently holds the last 20 tablet input gestures, and a semantic memory that holds up to 10 gestures that are performer defined as 'important.' The running memory will contain only control data while the semantic memory will contain both control and sonic data. The full sonic gestures of the semantic memory will be used to structure the agent's behaviour in sender mode, as well as to potentially make changes to the agent's audio processing chain. Qualities of the sonic gesture, such as rate of onsets, will control how the agent replays control data into the system's second synthesis module. When in receiver mode, the agent instead draws from the running memory, recalling gestures at random and replaying the control data into the synthesis module.

Additionally, there will be performer controlled meta-controls for the agent. I'm imagining just a couple of controls here, mapped to physical knobs - one being likelihood of being in either sender or receiver mode and another being a sort of 'stability' or how often the agent changes between the different variations.

Following from the above, I believe this project falls firmly into the overlap between instrument design, composition, and performance. I imagine it may end up falling more into the composition and performance overlap depending on the final behaviour of the agent - an open question I have is whether it will always fall into the same sort of compositional form, or will it be possible to 'guide' the system to different forms and sonic territory? A key part of something being 'instrumental' for me is the ability to play different compositions and different forms - I'm hoping that my project will end up in this territory, but only time will tell.

As stretch goals, there are two different directions I can imagine taking. One would be to implement another sonic mediation agent, in particular one that performs *The Tuning Meditation* with the human performer. I think it would be interesting to see how these meditations feel in contrast to each other and what kinds of sonic results each can produce. The other stretch goal would be to implement in parallel another *Interdependence* agent playing a third granular module, and giving both agents the ability to listen to the human performer or each other. I can imagine that this could lead to really interesting behaviours and dense textures - however the CPU limitations of my machine might be one bottleneck for implementing this.

Finally, I want to mention the album *Field Study* by musician sv1 as an aesthetic inspiration. I hope that performance with this system and agent will sonically be able to produce sounds that are both tonal and noisy, textures that can morph and change quickly, and music that feels both alien and deeply organic.

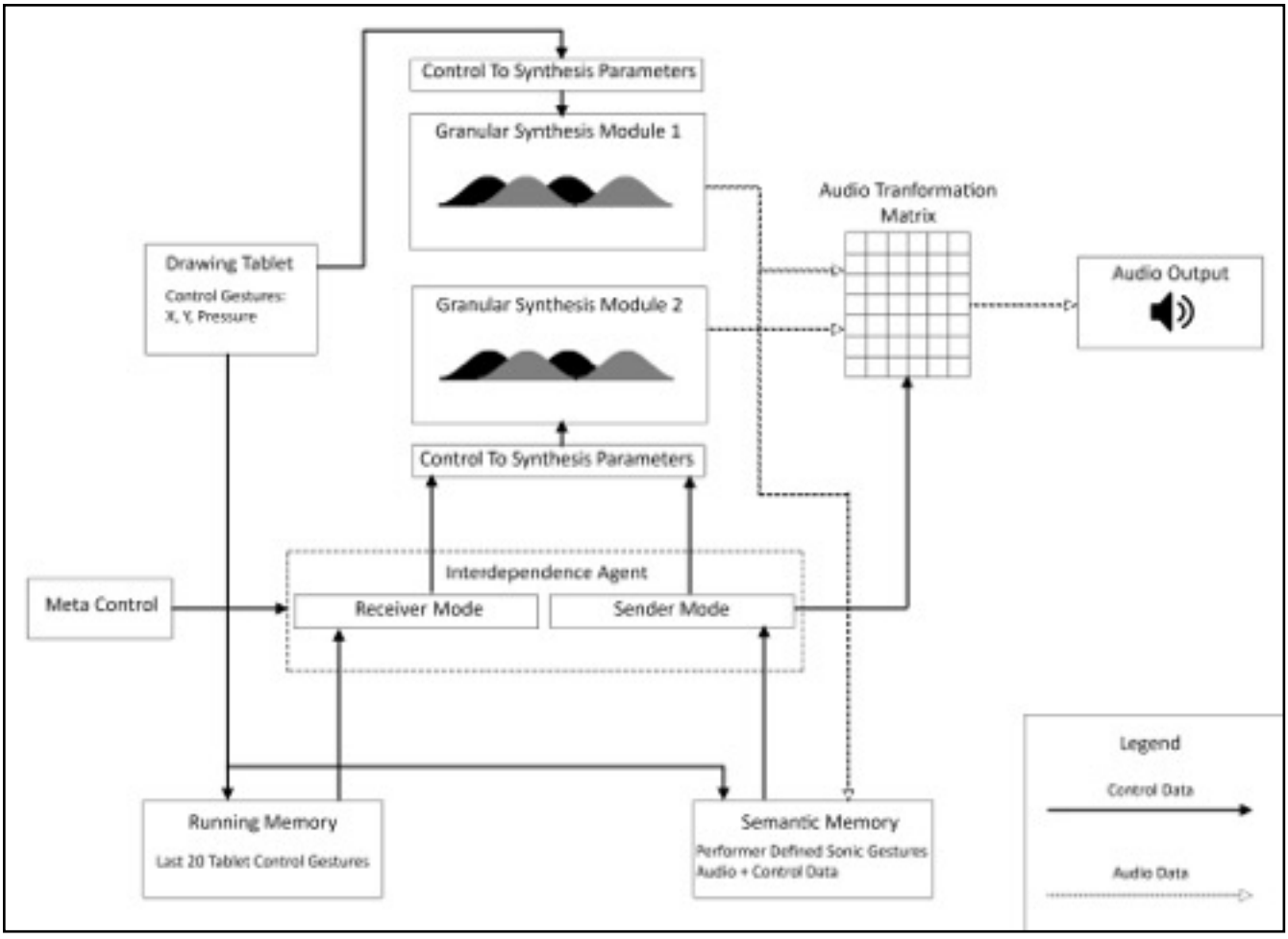

Fig 1 - System Diagram

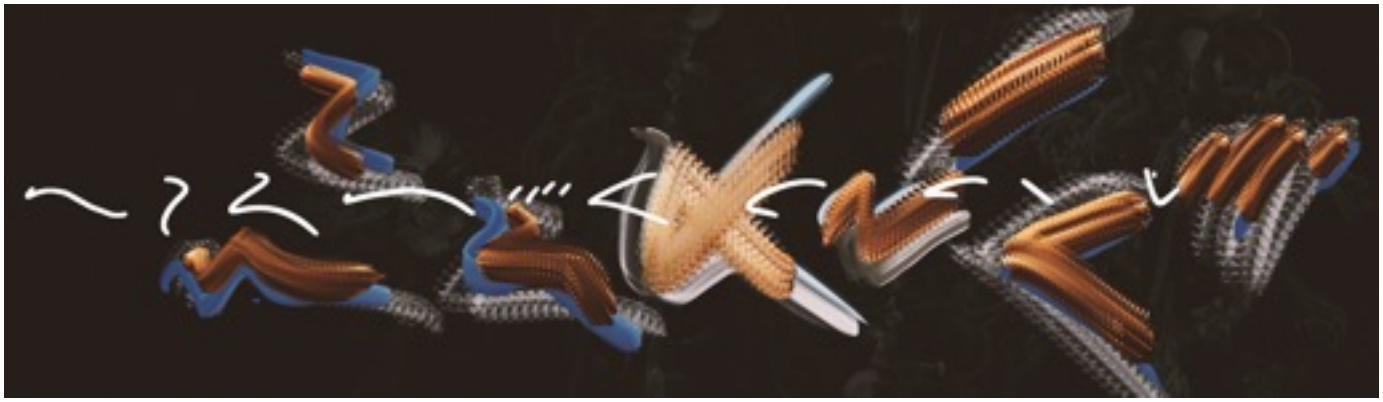

Fig 2 - Interpretive score; white marks are human gestures, coloured marks are machine recalled, transformed, and/or generated gestures

References

Godøy, R. I., & Leman, M. (Eds.). (2010). Musical gestures: Sound, movement, and meaning. Routledge.

Oliveros, P. (1997). Four mediations for orchestra.

sv1. (2020). Field study.

Van Nort, D., Oliveros, P., & Braasch, J. (2013). Electro/acoustic improvisation and deeply listening machines. Journal of New Music Research, 42(4), 303-324.