A Small Oil Painting of a Nest

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Additional Key Words and Phrases: Machine Learning, Onset Detection, FluCoMa, Max, Bela, Position Tracking, Drum, Percussion

1 Program Notes

A Small Oil Painting of a Nest is a 10 minute improvised performance that explores the sinew that connects the current now to the unrelenting sequence of nows that preceded it. This happens both at a microscopic level, using the different temporal perspectives of events to determine locality, and again at a macroscopic level to architect gesture and form through memory and ephemerality.

2 Project Description

I will perform using a hyperinstrument made from a snare drum with incorporated sensors and DIY controllers, all running on a dedicated real-time computing system (Bela Gem[1] and/or a laptop running Max). A Small Oil Painting of a Nest will showcase various aspects of my performance practice, including descriptor-based corpus navigation [3], drum strike classification, novel real-time absolute position detection (as discussed in the Technical Notes and seen in Figure 1), and complex mapping strategies as presented in Shier et al. [1].

The focus of the performance will be to push at the edges of what is possible using cutting-edge technologies in the context of real-time audio analysis-driven instrumental performance.

3 Technical Notes

The technical setup is built around four custom 3D-printed sensors mounted on a snare drum (Figure 1) which have their audio routed to a computer running a pre-trained neural network in using the FluCoMa[2] and Data Knot[3] packages. This is used to compute the absolute position of strikes on the drum, building on and further developing the approach originally discussed in Sokolovskis [2]. This data will be mapped to multiple processes including corpus navigation, physical modeling, and various other synthesis techniques that will make use of either cartesian or polar representations of the computed position data.

In addition to the embedded position tracking, some custom 3D-printed controllers will be used in the performance (see Figure 2).

4 Media Links

Here are some videos demonstrating several of the processes that will be incorporated into the performance.

- Demonstration of descriptor-based corpus navigation: https://www.youtube.com/watch?v=qezNlDjV2RU
- Demonstration of position-based physical model mapping: https://www.youtube.com/watch?v=sSarM34qBPM
- Demonstration of position tracking in Max: https://www.youtube.com/watch?v=iiabYmBxuBU
- Demonstration of similar processes in vanilla pd: https://www.youtube.com/watch?v=2l2jXvHIn3o

5 Ethical Standards

This performance describes a practice-based exploration by the author and did not involve experiments with other human participants, hence no institutional ethics board review was required. This work incorporates machine learning techniques, where all data used in training is generated by the author themselves.

[1] https://bela.io
[2] http://flucoma.org
[3] http://cycling74.com/packages/data-knot

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Fig. 1. Snare Drum with position markers for training neural network, 2025.

Fig. 2. Snare Drum with 3D-printed controllers, 2024.

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References

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