

**AIMC 2024 (09/09 - 11/09 )**

# Spomenik I

**Yigit Kolat**

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## Title

Spomenik I

## PubPub Link

<https://aimc2024.pubpub.org/pub/o0ltua9f/draft?access=5gyu6wcz>

## Project Description

NOTE: The single-page document below contains visual examples that are referred with numbers in brackets in the Project Description.



[SPOMENIK\\_examples.pdf](#)

2 MB

A small ensemble work written for flute, violin, tuba, vibraphone, resonant metal, and fixed media.

The role of AI in the piece is two-fold: the work employs a multilayer perceptron network (MLP) to generate symbolic musical material and features commercials for imaginary AI products which were generated via a combination of commercial AI services.

The MLP aspect of the piece consists of several steps. The user first generates a *spomenik* (“monument” in various Slavic languages) by creating points in a 3D space using a Matplotlib-based custom 3D interface [1]. Using another interface in Python, the user decides standard deviations (along with some other values) for notational parameters such as pitch, rhythm, dynamics, and instrumental resonance [2, **partially shown**]. The actual values for these parameters are then generated by drawing random samples from a Gaussian distribution. Each random process was provided a seed in order to access the results for further compositional/instrumental shaping. This process readily outputs a musical passage that is editable for fine-tuning [3].

For training purposes, only the initial inputs mentioned above are used in this piece, rather than the results of the Gaussian sampling that provide the actual parameter values [4, **partially shown**]. Elements that are added after the generation such as *vibrati* are discarded for training. The MLP network is then trained as a regressor. It is comprised of an input layer with 3 inputs which are the  $x$ ,  $y$ , and  $z$  coordinates that were drawn in the *spomenik* earlier, two hidden layers, and an output layer which contains 25 notational parameter values [5].

After the training is completed, the user creates another *spomenik* using the 3D interface, this time for prediction purposes. The system predicts notational parameters based on the provided points in the 3D space and immediately generates musical notations [6]. In this piece, generated notations do not appear in the score, however their parameters are used to create the resonant metal part in SuperCollider programming/sound synthesis environment [7, **partially shown**]. “Resonant metal” refers to a rectangular stainless steel surface

that is used as an acoustic medium for a surface transducer and piezo contact microphone pair [8]. The surface transducer only emits a band limited impulse, however the feedback loop created by the close proximity of the piezo contact microphone opens up a timbral diversity that ranges from quasi-sinusoid to noise thanks to the gain parameter controlling the mic input [7].

Second AI-related aspect of the music appears in three AI-generated videos that interrupt the performance. The first of these is a teaser for the sequel of the work, *Spomenik II*. The absurdity of this commodification attempt is further reinforced at the end of the performance where the audience is offered an “ad-free experience” of *Spomenik I* in exchange of supporting the composer on Patreon (the Patreon link is deliberately non-existent).

The next two commercials feature two imaginary generative AI products. Both products claim to address the issue of accessibility in the space of contemporary concert music. The stark contrast between the “disruptive” AI startup narrative and the awkward product demos that immediately follow emphasizes the artificiality of this particular problem/solution space and questions the ill-defined concept of “accessible music”.

In this sense, the piece can be connected to cultural studies, ethics, aesthetics, as well as post-conceptualism. The notation-related research relates to statistics and sound art.

Technical notes:

- The custom MLP network is trained in a Google Colab environment with Intel Xeon CPU with 2x vCPU, 13GB RAM.
- All notation-related work is done in Python.
- The video clips are generated with [Runway Gen-2](#). Product logos as well as some of the imagery in the videos are generated with [OpenAI DALL-E 3](#). For the voice clips, [Eleven Multilingual v2](#) model is used. The music that accompanies to product logos in the videos are generated via [Riffusion](#).

## Type of submission

This work is most suitable for **Performance 1** at the Wolfson College auditorium, since it features 1-4 professional instrumental players (see below), fixed electronics and video.

## Technical/Stage Requirements

- The piece uses an on-stage platform (i.e. a table) with a laptop, an audio interface with minimum 3 outputs, a mini amplifier for the transducer, a signal divider for click-tracks, a surface transducer, and all necessary cables, wires, connectors, adapters, and power adapters -- all these will be provided by the composer [8].
- For audio, a line-level XLR mono output is provided to the house. For video, an HDMI output without audio signal is provided.

- While the original medium of the work is flute, violin, vibraphone, tuba, and resonant metal, the work can be easily arranged into any subset of the ensemble, as long as the resonant metal and video components are present.
- It is not possible for me to confirm that I am able to provide performers at the time of submission.
- I currently live in the U.S. . Since transatlantic travel with a large metal surface is not practical, in case of acceptance, I will make sure that I will be able to locally access to a similar material for the performance.

## Program Notes

“A concept is a brick. It can be used to build the courthouse of reason. Or it can be thrown through the window.” —Brian Massumi, in *Pleasures of Philosophy*, a translator’s foreword to Deleuze & Guattari’s *A Thousand Plateaus*

*Spomenik* means “monument” in various Slavic languages, however the word particularly refers to the massive abstract sculptures erected in the Former Yugoslavia countries after WWII. The piece relates to its namesake by depending on a 3D graph, a *spomenik*, which represents a dataset of musical parameters that is used to train a generative AI process.

The commercials that interrupt the musical flow are products of generative AI processes as well. Do they simply exist as caricatures of over-hyped products in generative AI startup space? Is it only about taking a jab at an ill-defined form of “accessibility” in new music? Or, are they suggesting that what they are doing is the only viable approach to generative AI in a capitalist society?

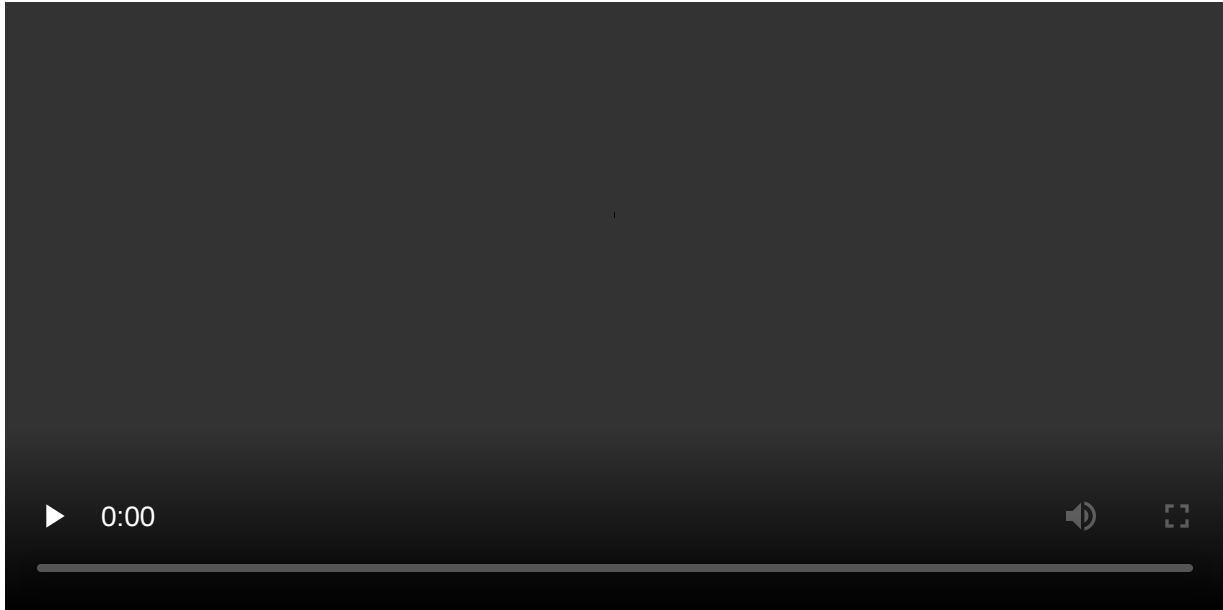
## Media

- Images (apologies for not having higher resolution photos):





- Video:



University of Washington Modern Music Ensemble, featuring Rachel Reyes (flute), Justin Zeitlinger (violin), Cole Henslee (tuba), and Melissa Wang (vibraphone)

- Score:



[Kolat\\_Spomenik\\_I.pdf](#)

10 MB

## Acknowledgements

- I would like to thank the University of Washington Modern Music Ensemble members Rachel Reyes, Justin Zeitlinger, Cole Henslee, and Melissa Wang for their efforts and their wonderful performance; and the ensemble director Dr. Cristina Valdés for her support.