ΕΘΝΙΚΟ ΚΑΙ ΚΑΠΟΔΙΣΤΡΙΑΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
ΦΙΛΟΣΟΦΙΚΗ ΣΧΟΛΗ
ΤΜΗΜΑ ΜΟΥΣΙΚΩΝ ΣΠΟΥΔΩΝ
Laboratoty of Music Acoustics and Technology

LabMAT

SUMMER SCHOOL
Music Programming in PYTHON
8-15 July 2021
Dr. Daniel Brown (Intelligentmusicsystems, USA)

Course Description:

Students will learn the basics of computational modeling of musical parameters, and how to manipulate those parameters in order to compose new music and analyze existing music.By working in Python, students will learn the fundamentals of both Object-Oriented Programming and Functional Programming, and how useful these paradigms are for computational modeling of music. Along with the basics of the Python language, students will learn how to use music and mathematical libraries from Python's rich library collection in order to create their own analysis and/or composition programs. The class will be hands-on: by the end, students will have completed several working projects, and will have an extensive set of tools to use for future projects.

Topics covered will include knowledge representation, probabilistic models and Markov chains, grammatical models, perceptual models and feature classification, sonification and musification, musical form, real-time composition, and communication between Python and Max/MSP.

Examples from both traditional and modern music will illustrate the material taught.

Bio:

Daniel Brown is a leading researcher and programmer in the field of computer-generated composition. He is the founder of Intelligent Music Systems LLC, located in Oakland, California, and the designer of the Dynamic Percussion System, software for real-time, adaptive composition that was used in the AAA games Rise of the Tomb Raider (2015) and Marvel's Avengers (2020). He received a Doctorate in Musical Arts from the University of California, Santa Cruz, studying under David Cope. He is also a composer, cellist, and educator.

SCHEDULE

Note: each day will include both lectures and time for students to work on individual projects with help from the teacher and assistants.

DAY 1: Python Basics I: Data types and functions. Working with MIDI and audio files. Representing musical parameters with code. Composing your first piece with Python.

DAY 2: Python Basics II: Defining your own functions. Object-oriented programming: using classes and designing your own classes. Hierarchical models of music.

DAY 3: Data analysis with Python. Sonification: listening to data.

DAY 4: Real-time music generation with Python and Max.

DAY 5: Digital signal processing with Python.

DAY 6 (optional): Presentations of students' projects.