Jacob Hume

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RELEVANT EXPERIENCE

Telemann Chorale Project, University of Michigan, Ann Arbor, MI

October 2020 - PRESENT

Member of a team working to computationally model human musical creativity through a lens of musicolinguistics and generative grammar. Team's main project involves developing an artificially intelligent model capable of 'thinking musically' to generate the inner two voices omitted from the 430 chorales composed by Bach contemporary Georg Philip Telemann. By adapting the model to behave in accordance with current theories regarding generative musical syntax, the project ultimately seeks to shed light into how the mind fundamentally generates and processes musical structure.

Shift Creator Space, University of Michigan, Ann Arbor, MI

SEPTEMBER 2020 - PRESENT

One of three first-year students selected to be a member of a close-knit community dedicated to interdisciplinary innovation and collaboration. Individual project this year is the development of the 'multitimbral cello' — an attachable device which can alter the character of a cello's sound without external amplification or effects. Such a device can be used to engender natural delay-based effects (e.g. reverb), induce wolf tones, and generate multi-part harmonizations — with each new sound produced by the actuated instrument itself.

UM Solar Car, Microsystems Division, University of Michigan, Ann Arbor, MI

SEPTEMBER 2020 - PRESENT

Work with team to discuss, design, develop, and program printed circuit boards to be integrated into the structure of a solar powered vehicle which will race across the Australian continent in 2021 against other programs throughout the world in the biennial Bridgestone World Solar Challenge (team placed 3rd in 2019). Currently leading two projects focused on the car's audio and telemetry systems.

EDUCATION

University of Michigan
Ann Arbor, MI
Electrical Engineering
Cognitive Science
GPA: 3.96/4.0
APRIL 2024 (Expected)

Farmington High School,
Farmington, MI
GPA: 3.98/4.0 (UW)
JUNE 2020

Relevant Coursework:

Physics of Music/psychoacoustics; Data Structures and Algorithms; Musicolinguistics; Honors Mechanics/E&M (Python intensive); Honors Differential Equations; Proof-based Linear Algebra

AWARDS

1st PLACE, Shift Creator Space Makeathon (2020)

2nd PLACE, National BPA Competition, SQL Information Systems event (2019)

1st PLACE, State BPA Competition, SQL event (2019, 2018).

5th PLACE, State HOSA Competition, Original Medical Innovation event (2019)

Boston University Research in Science and Engineering Program (RISE), Boston, MA

JUNE 2019 - AUGUST 2019

Conducted research in the field of computational neurobiology & presented findings to BU/MIT scientific community. Research involved modeling the effects of Auditory Verbal Agnosia (AVA) on music perception, with implications in fields of brain-computer interfaces, auditory perception, and musicology in addition to AVA. Program also offered advanced coursework in neuroscience and machine learning.

PROJECTS

SoniCelegans, University of Michigan ArtsEngine

May 2021 - PRESENT (First exhibition takes place 9/26/2021)

Worked closely inside a faculty-student team with backgrounds in electrical engineering/computer science, cognitive neuroscience, and performing arts technology/DSP to develop a multimedia exhibition exploring learning, memory, neuronal networks and navigation through a lens of data sonification and algorithmic composition as well as the development of an adaptive graphic score. How might a musical score learn? What does memory sound like? How can we musically represent mazes and networks — what does it mean to get lost in sound? Is there a relationship between stochasticity and improvisation? Contemporary ponderings in cognitive and computational sciences have already been sparking artistic exploration for thousands of years; this endeavor seeks to acquaint the two fields in a symbiotic way.

Fall Makeathon, Shift Creator Space, University of Michigan, Ann Arbor, MI

OCTOBER 2020

Placed 1st at the Fall 2020 Makeathon with "Breaking the Fourth Wall", an aleatoric, interactive musical installation in which composer and listener effectively create music together. Our group developed a 3-D modeling application in which visual cues (locations, shapes, textures, sizes) correlate with musical ones to create an ever-unique audiovisual experience. By contrasting the perceived ephemerality of sound with the perceived permanence of physical structures, the piece aims to 'Break the Fourth Wall' between creating and consuming music.

Eye-♫ote Therapeutic Software, Farmington High School

MAY 2018 - FEBRUARY 2020

Designed and developed an eye-tracking interface allowing physically disabled individuals to compose music. Placed 5th out of 180+ competitors at Michigan HOSA State Competition.

SPECIALIZED SKILLS

PROGRAMMING: Experience with C++, Max/Msp/Pd, Python, SQL, & Matlab as well as Altium Designer & Unity

MUSIC PRODUCTION: Proficient in recording and mixing audio in Logic Pro X & Reaper DAWs; Proficient in use of notation editors to arrange, compose and engrave music (MuseScore, Sibelius)

MUSIC PERFORMANCE: Nine years experience playing cello, with lessons continuing at the University of Michigan. Experience playing classical guitar, piano, rock/jazz guitar, viola da gamba

MUSIC COMPOSITION: Composed/produced original soundtracks for two indie video games titled *Moonja* and *Escaping&Entering* during 2020

RESEARCH: Experience conducting research and presenting findings to scientific community