Benjamin Genchel

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Education

M.S. Music Technology   **Georgia Institute of Technology**
Focus: Music Informatics, Generative Models   Graduated: May 2019

B.S. Electrical Engineering, minor in Mathematics   **University of California, San Diego**
Focus: Computer Science, Machine Learning   Graduated: June 2015

Experience

Expressive Machinery Lab | *Lead Developer, Software Engineer*   Aug. 2018 – Present
- Developed a fully featured, single-page web application for GrooveMachine, a pedagogical musical sequencer that teaches computer science concepts, using Node.js, Pixi.js and Tone.js.
- Managed 3 developers and 1 designer, facilitating productivity by clarifying key tasks and timelines, working to remove blocks, and providing input and assistance where needed.
- Created a structure and style guide for writing documentation, implemented code conventions, and developed a cross-platform install script to aid in new developer onboarding.

Music Informatics Group | *Graduate Researcher*   Aug. 2017 – Present
- Developed deep learning generative models for symbolic music generation using PyTorch based on GAN, RNN, and convolutional auto-encoder architectures trained via supervised learning and reinforcement learning.
- Developed infrastructure around each project, including scripts and functions for data conversion, data parsing, data cleaning, logging, model training, model evaluation, and model generation.
- Maintained clean, readable and extensible code via object-oriented design, encapsulation and file structure.

Classy.org | *Data Science Intern*   Jan. 2017 – May 2017
- Applied LDA to discover topic clusters in a large database of customer service conversations (~116K documents) and visualized them using 2D and 3D t-SNE.
- Developed a classifier for recommending support articles using Doc2Vec embeddings and KNN.
- Applied VADER sentiment analysis to customer service data to track emotions through the course of conversations and examine the accuracy of customer reported satisfaction surveys.

CleverPet | *Software Engineer*   Jun. 2015 – Sept. 2016
- Architected, developed, tested and maintained Python cloud backend on Google Cloud Platform.
- Developed embedded firmware in C++ for interfacing with cloud backend and interacting with users.
- Created and presented a design proposal for mobile apps.
- Collaborated closely with founders and leads, aiding in discussions on system architecture, customer support and marketing.

The Intellisis Corporation | *Software Engineering Intern*   Jun. 2014 – Sept. 2014
- Built and designed a native Android application in Java to demonstrate the mobile potential of a speaker recognition based security system.
- Developed a Python desktop application/interface for collecting data on potential system attacks.
- Parallelized Python/Py.test unit test runs resulting in 10x reduced total run time.

Publications (selected)

Explicitly Conditioning Melody Generation: A Case Study with Interdependent RNNs
Proceedings of the 7th International Workshop on Musical Meta-creation (MUME). Charlotte, North Carolina 2019.

Projects (selected)

Musical Painting Bot   Feb. 2018 – Present
Robot that virtually paints along to sound on virtual canvases (visualizations) that produce musical events. Built with python3, arduino, node.js, p5.js, openCV, and Max/MSP linked with OSC / UDP. Performed with live at local concerts.

Snow White Magic Mirror   May 2019 – Present
Voice activated model of the Magic Mirror from Disney's *Snow White*. Built with RaspberryPi, Blender, OpenGL.

Evolving Towards Green Sleeves   Mar. 2018 – Apr. 2018
Sonification of an evolutionary algorithm learning to play 'Green Sleeves'. Built with vanilla Numpy. Available on Spotify..

Skills

Algorithms
Data Structures
Deep Learning
Machine Learning
OOP / OOD
Data Pipelining
Data Analysis
Probability
ANOVA
Web Development
DSP
System Design
Software Testing
Linear Algebra
Electronics

Languages

Python
C++
JavaScript
MatLab
Java
HTML
CSS
SQL

Libraries

PyTorch
Numpy
Scipy
Matplotlib
Pandas
JQuery
Bootstrap
Pixi.js
P5.js

Tools

Linux
Unix
Git
Github
Vim
Tmux
GCP
AWS
Node.js
Arduino
Max/MSP
Ableton Live