Hugo Flores García

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Website // Google Scholar // GitHub

BIO

I perform research at the intersection of music, machine learning, and human computer interaction. I'm interested in building interfaces for musical expression, powered by deep learning.

EDUCATION

Northwestern University — Evanston, IL
Ph.D. in Computer Science — *2020 - Present (expected 2025)*

Georgia Southern University — Statesboro, GA
B.S. in Electrical Engineering — *2016 - 2020*

EXPERIENCE

Adobe Research — San Francisco, CA
Research Intern — *2024.06 - 2024.12*
- Advisors: Prem Seetharaman, Oriol Nieto, Justin Salamon

Descript — Remote
Research Intern — *2022.09 - 2023.05*
- Advisor: Prem Seetharaman

Spotify — Remote
Research Intern, Audio Intelligence — *2022.06 - 2022.09*
- Advisors: Rachel Bittner and Jan Van Balen

Northwestern University — Evanston, IL
Research Assistant, Interactive Audio Lab — *2020.08 - present*
- Advisor: Bryan Pardo

Audacity (Google Summer of Code) — Remote
Developer — *2021.05-2021.09*
- Source Separation and Extensible Deep Learning Tools

Georgia Southern University — Statesboro, GA
Research Assistant — *2018.08 - 2020.05*
- Advisor: Fernando Ríos

SELECTED PUBLICATIONS

1. H. Flores Garcia, P. Seetharaman, R. Kumar, and B. Pardo. Vampnet: Music generation via masked acoustic token modeling. In *ISMIR*, 2023
2. H. Flores Garcia, P. O'Reilly, A. Aguilar, C. Benetatos, Z. Duan, and B. Pardo. Harp: Bringing deep learning to the daw with hosted, asynchronous, remote processing. In *7th Workshop on Machine Learning for Creativity and Design at NeurIPS 2023*, 2023
3. Y. Wang, H. F. García, and J. Choi. *Few-Shot and Zero-Shot Learning for Music Information Retrieval*. In 23rd International Society of Music Information Retrieval Conference, 2022
4. H. Flores Garcia, A. Aguilar, E. Manilow, and B. Pardo. Leveraging hierarchical structures for few-shot musical instrument recognition. In *Proceedings of the 22nd International Society of Music Information Retrieval Conference (Best Paper Award)*, 2021
5. H. Flores Garcia, A. Aguilar, E. Manilow, D. Vedenko, and B. Pardo. Deep learning tools for audacity: Helping researchers expand the artist's toolkit. In *5th Workshop on Machine Learning for Creativity and Design at NeurIPS 2021*, 2021

ART INSTALLATIONS

Token Telephone
NIME 2024 Conference, Experimental Sound Studio *2024*
Quadraphonic Interactive Neural Sound Installation. Collaboration with Stephan Moore. demo video available at https://www.youtube.com/watch?v=vEaYoEgtSUo&t

Salad Bowl
NeurIPS 2023 Creative AI *2023*
Interactive Neural Sound Installation. Collaboration with Stephan Moore and Bryan Pardo.

SELECTED COMPOSITIONS

world of mouth
premiered at Experimental Sound Studio, Chicago *Feb 2024*
8 channel fixed media composition. Sonic environments built by vocal gestures processed by a generative model. Premiered at the Chicago Creative Machines series Experimental Sound Studio (Feb 2024). Featured in UNPOP exhibition at Burning Man 2024 and UNPOP REDUX at the University of Alberta's Sound Studies Institute Gallery.

confluyo yo
premiered at ISMIR 2023 in Milan, Italy *November 2023*
for tenor saxophone and a generative sound model.

flowerbeds
premiered at Channel Noise 2019 at Georgia Southern University *2019*
audiovisual live coding.

SELECTED PERFORMANCES

StretchMetal's Drone Rodeo
the Hideout, Chicago *March 2024*
40 mins of improvised ambient with synths, electronics, neural networks (AudioStellar) and markov chains. full performance available at https://www.youtube.com/watch?v=T6eGKgeG7o0.

Chicago Creative Machines
Experimental Sound Studio, Chicago *Feb 2024*
improvisation with AudioStellar and bass guitar. full performance available at https://www.youtube.com/live/NfhlRH5k-bg?si=YeXQcjNr1NrtuqZ2&t=5001.

OPEN SOURCE SOFTWARE

unloop
Developer *2023 - Present*
Unloop is a looper pedal in Max/MSP (standalone soon) that uses generative modeling to not repeat itself.
See https://github.com/hugofloresgarcia/unloop.html.

HARP
Lead Developer *2023 - Present*
HARP is a sample editor that allows for hosted, asynchronous, remote processing of audio with machine learning.
See https://github.com/audacitorch/HARP.html.

nesquik
Nesquik is a vampnet-based audio effect that will transform any instrumental music audio into an "8-bit", NES-style chiptune.
See https://huggingface.co/spaces/hugggof/nesquik.

Audacity (Audio Editor)
Developer *2021 - 2022*
Contributed a software framework that lets deep learning practitioners easily integrate their own PyTorch models into the open-source Audacity DAW. This lets ML audio researchers put tools in the hands of sound artists without doing DAW-specific development work.
See https://interactiveaudiolab.github.io/project/audacity.html.

torchopenl3
A PyTorch port of the OpenL3 audio embedding model.
Used as class materials for CS 352 - Machine Perception of Music and Audio
See https://github.com/hugofloresgarcia/torchopenl3.

Philharmonia Dataset
PyTorch dataset bindings for the Philharmonia Orchestra sound samples.
Used as class materials for CS 352 - Machine Perception of Music and Audio
See https://github.com/hugofloresgarcia/philharmonia-dataset.

TALKS

The Voice is the Interface and Other Techniques for VampNet
Bay Area Signal Hackers (BISH) BASH *August 1 2024*

Compositional Techniques for VampNet
AI Music Reading Group, MIT Media Lab *April 15 2024*

generative sound for the sonic arts!
Chicago Creative Machines, Experimental Sound Studio *Feb 25 2024*

writing about music is like dancing about architecture!
GLASS Human-Centered AI Music Symposium, Northwestern University *Jan 26 2024*

VampNet: Music Generation via Masked Transformers
Spotify MIQ Reading Group *September 6 2023*

Deep Learning for Music Interfaces
Universidad Nacional Autónoma de México (UNAM) *April 6 2022*

Leveraging Hierarchical Structures for Few-Shot Musical Instrument Recognition
ISMIR 2021 *November 9 2021*

Deep Learning Tools For Audacity: Helping Researchers Expand the Artist's Toolkit
Bay Innovative Signal Hackers (BISH) Bash *October 27 2021*

Deep Learning Tools For Audacity: Helping Researchers Expand the Artist's Toolkit
Neural Audio Synthesis Hackathon (NASH) Workshop *December 12 2021*

HONORS AND AWARDS

ICASSP Outstanding Reviewer Award
ICASSP 2023 *2023*

Best Paper Award - Leveraging Hierarchical Structures for Few Shot Musical Instrument Recognition
ISMIR 2021 *2021*

Cognitive Science Fellowship
Northwestern University *2020 - 2021*

Lewis and Charlene Stewart Jazz Scholarship
Georgia Southern University *2016 - 2020*

Coastal Jazz Scholarship
Coastal Jazz Association *2019*

Undergraduate Research Grant
Georgia Southern University *2018*

Honors Program 1906 Scholarship
Georgia Southern University *2016-2020*

SKILLS

- **Programming Languages** - *Expert:* Python, C/C++, *Intermediate*: Javascript, Lua (norns)
- **Machine Learning** - *Expert:* PyTorch, libtorch, Scipy, Numpy, Scikit-learn
- **Creative Coding** - *Expert:* SuperCollider, Max/MSP/Jitter, *Intermediate:* OpenFrameworks, P5js, PureData, JUCE
- **Music Production** - Logic Pro, Avid ProTools
- **Languages** - I can read/write/speak English and Spanish proficiently.

TEACHING

Instructor
Northwestern University *Spring 2024*
Computing Everywhere Workshop. Human-Computer Interfaces for Musicking (with Annie Chu)

Instructor
Northwestern University *Winter 2024*
Computing Everywhere Workshop. Generative AI (with Julia Barnett)

Teaching Assistant
Northwestern University *Spring 2022*
COMP_SCI 497 – Digital Musical Instrument Design

Teaching Assistant
Northwestern University *Fall 2021*
EECS 349 – Intro to Machine Learning

Teaching Assistant
Georgia Southern University *2018 - 2019*
Electric Circuit Analysis

SERVICE

Reviewer
ISMIR 2024 *2024*

Reviewer
ICASSP 2023 *2023*

Reviewer
CHI 2023 *2023*

Reviewer
ICASSP 2022 *2022*

Board Member
Latin@CS - Northwestern University *Fall 2021*