HUAY **DIN**

B.S. Candidate in Math and Physics | Class of 2023

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♀ 10900 Euclid Ave, Cleveland, OH 44106, USA

Undergraduate Math and Physics Major at Case Western Reserve University; Will obtain degree by January 2023.



EDUCATION

Expected 2023

B.S Mathematics and Physics Candidate, at Case Western Reserve University School of Arts and Sciences.



August 2022

Accelerating Kidney MRF with DL methods, PI: YONG CHEN, Case Western Reserve University -**University Hospitals**

Ongoing

> Submitted a first author abstract to ISMRM 2023.

- > Developed and optimized a spatial-constrained convolutional neural network to accelerate 2D kidney MRF acquisition
- > Evaluated the model's capability to quantify T1 and T2 relaxation times for renal cell carcinomas.
- > Handled clinical MRF data acquired from volunteers, patients with malignant RCC tumors, and from different Siemens scanners.

DL MRF Kidney MRF Renal Cell Carcinomas Pytorch

June 2022

Super-resolution for Dual Energy Dual Layer Flat Panel Detector CT Images, PI: ADAM WANG, Stanford University

August 2022

- > Submitted a first author abstract to SPIE Medical Imaging 2023 (Accepted).
- > Applied, measured and analyzed Fourier based characteristic transfer functions (modulation transfer function, noise-power spectrum, detective quantum efficiency) to model DEDL FPDs for super resolution.
- > Applied a variety of classic super resolution convolutional neural network models as a metric to compare to investigate the particular research problem

CNNs Super-resolution Dual Layer Detector Pytorch CT

August 2021 -Ongoing

Machine Learning for Magnetic Resonance Fingerprinting, PI: JULIA DOBROSOTSKAYA, CWRU

- > Designed a generalized MRF image reconstruction model through constructing a balanced training set (which contains synthetic and natural images) and using the framework of fully connected neural
- > Used the tools of real analysis to mathematically formulate the MRF problem to better inform the design of the training set and model.
- > Emphasized the construction of a balanced and diverse training set to cover the desired T1 and T2 relaxation time range.

MRF Neural Networks MATLAB Python

June 2021 April 2022

Crystals of Sound, COLLABORATOR: JESSE BEREZOVSKY, CWRU

- > Configured computer architecture and networking for reliable communication without Internet
- > Created Pure Data patches to route live messages from original program to performers
- > Held a concert in collaboration with CIM (click here for link to performance).

Pure Data Music Algorithmic Compositions

May 2020

Critical behavior and the Kibble-Zurek Mechanism in a musical phase transition, PI: JESSE BEREZOVSKY, CWRU

September 2022

- > Paper currently in peer review for PLOS ONE
- > Appplied Monte Carlo/Langevin algorithms to a novel 3D XY model for a lattice of notes.
- > Conducted data analysis on simulations to investigate universality, critical behavior and the Kibble Zurek Mechansism.
- > Performed simulations on high performance computing cluster.

Statistical Mechanics | HPC | MATLAB | Music

HUAY DIN - CV 1

November 2020 June 2021

Coding Scholar, Case Western Reserve University, CWRU

- > Programmed tools and other applets related to current research with Jesse Berezovsky with Pure-Data*.
- > Created an in-browser markable Tonnetz Diagram**.
- > Programmed three.js animated algorithmic composition based off of results from previous research with Jesse Berezovsky**.
- *Tools used in Crystals of Sound Concert
- *Apps can be found at huaydin.github.io

JavaScript three.js Boids Algorithmic Compositions

AWARDS AND SCHOLARSHIPS

Summer 2022 American Association of Physicists in Medicine Summer Undergraduate Research Fellow

Spring 2022 James C Wyant Award - Awarded by the CWRU Physics Department for research accomplishments outside

the senior project

Spring 2021 - Case Alumni Association Junior-Senior Scholarship

Spring 2023

Summer 2020 SOURCE Research Fellow

PREVIOUS PRESENTATIONS

March, 2022 @ the 2022 APS March Meeting Session Y08 : Chaos and Nonlinear Dynamics II; Title : Phase

transitions, critical behavior, and emergent order in systems of musical harmony*

November, 2021 @ the Meeting of the Eastern Great Lakes Session C01: Lightning Sessions Student Posters;

Title: Phase transitions, critical behavior, and emergent order in systems of musical harmony*

EXTRACURRICULARS

2022 - Ongoing Association for Women in Mathematics CWRU Chapter: (Fall 2022) Co-President + Founder

2020 - Ongoing CWRU Math Club Exec: (Fall 2022 - Spring 2023) Co-President, (Fall 2021 - Spring 2022) Treasurer, (Fall 2020)

Secretary

2020 Office of Multicultural Affairs - Advisory Council: (Spring 2020)

2019 - Ongoing CWRU Literary Magazine Exec : (Fall 2019 - Spring 2022) Business Manager

SKILLS

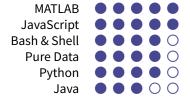
Programming Languages MATLAB, Python, Javascript (three.js), HTML5/CSS, Bash & Shell, General Data Entry

Development Tools Visual Studio Code, Atom, git.

Office Tools LaTeX, Google Drive(Documents, Sheets, MS Office). High Performance Computing Cluster

Programming Languages







PROFESSIONAL INTERESTS: Phase Transitions, Non-equilibrium dynamics, Quantum Computing, Quantum Information, Machine Learning

READING: NK Jemison, Haruki Nakamura

EDUCATION: Math Pedagogy

Music: Viola, Composition, Algorithmic Composition

Huay Din - CV 2