

# Benny (Shicheng) Zhang

Phone: 1-(217)-721-7190 Email: sz18@illinois.edu

Website: <https://shichengzhang.web.illinois.edu/>

## EDUCATION

### University of Illinois Urbana-Champaign (United States)

Bachelor of Science in Computer Science and Music

Bachelor of Science in Liberal Arts & Sciences in Psychology, Cognitive Neuroscience concentration

2018 - 2022

GPA: 3.81/4.00

### Shenzhen College of International Education (China)

High School Diploma with A+ in GCSE English Literature & Drama Performance, A+AA in A-Level Math, CS & Physics

2014 - 2018

## COURSES

### Computer Science

Machine Learning for Signals, Data Mining, Artificial Intelligence, Natural Language Processing, Audio Computing Lab, Programming Language & Compilers, Intro to Computer Systems, Data Structures, Algorithm, Software Studio (SP22)

### Psychology

Cognitive Neuroscience, Neurolinguistics, Behavioral Neuroscience lab, Memory and Amnesia, Evolutionary Neuroscience, Industrial & Organizational Psychology, Social Psychology, Cognitive Neuroscience Lab (SP22)

### Music

Honor Music Theory, Honor Musicianship (rank: 3/105), Analysis of Music in 19<sup>th</sup> Century, Computer-based Music Representation and Synthesis, Electronic Music Synthesis, Electroacoustics Music techniques, Music History, Jazz Aural Skills, Music & Sound & Technology, C++ Audio Application studio, World Music

### Additional Experiences:

2019 – Stanford CCRMA Audio Neural Nets Workshop

2019 – Peking University Summer School – Modern Approach to Machine Learning

## EXPERIENCE

### Computer Science

#### Tencent Music Entertainment

June 2020 - Sept 2020

Shenzhen, China

#### Multimedia Algorithm Research Internship

- Carried out Exploratory Data Analysis on the million-scaled user data in the QQ music with pandas and matplotlib.  
- Researched, invented, and implemented a novel *Levenshtein-distance* based music harmony information retrieval deep learning system for mining future pop hit songs from the world largest copyrighted music database. Hit-song prediction precision increased significantly. Algorithm was integrated into PDM and carried out A/B Test.

#### CAMIL Lab at UIUC

Aug 2019 - May 2020

Urbana, IL

#### Independent Researcher, supervised by UIUC ECE Prof. James Beauchamp

- Researched and implemented a Short time Fourier Transform based f-0 frequency detection system for recognizing music harmony in sinewave generated music.  
- Designed and implemented IIR filter, Convolutional Reverb, NMF-based source separation, HRTF-based sound localization, Independent Component Analysis, ISOMAP algorithm in SciPy (Python).

#### Freelance Music Researcher

Aug 2021-Present

Urbana, IL

#### Independent Researcher

- Designed a new symbol system describing the western tonal music inspired from the Chinese zither (GuQin) tablature representation. And converted this chord symbol into a machine learnable embedding containing more information than the normal roman numerals and jazz chord symbols representation.  
- Analyzed Liszt Transcendental Etude's No.4-Mazappa and La Campanella in Schenker style and resynthesized a new piece with corresponding textures and melodies by python.  
- Developed an instrumentation and voicing informed deep chord recognition system with a domain-specific-knowledge-empowered artifact dataset.

#### Course Assistant for Computational Music

Aug 2020-Present

Urbana, IL

#### MUS105 Computational Music I FA20

- Assisted Prof Henrich Taube on course logistics, hosted the class piazza forum, answered registered student programming question, and provided career suggestions to class member.

### Psychology

#### Electrophysiology and Language Processing Lab at UIUC

Aug 2021-Present

Urbana, IL

#### Research Assistant

- Operating 32-nodes EEG headset with capping and cleaning process for psycholinguistics experiment.

- Learned data processing techniques on collected EEG data, such as Independent Component Analysis for removing muscular movement in MNE-Python.

**Behavioral Neuroscience Lab at UIUC***PSYC 311 course student***Jan 2021-May 2021****Urbana, IL**

- Dissected sheep brain and labeled neural structures from both sagittal and coronal view, identified all the main white and grey matter with their associated physiological function in central nervous system.
- Handled experiment rat in vivo and carried out experiment including topics such as alcohol-anxiety, elevated T-maze, water maze, and reproduction. Wrote scientific reports for the above studies.

**Freelance Algorithm development with EEG data***Independent Researcher***Jan 2021-Present****Urbana, IL**

- Built an epilepsy data sonification algorithm mapping epilepsy data into different degrees of musical tonality.
- Utilized Emotive EPOC-X 16-nodes commercial grade EEG headset to map ERP event to musical parameter such as musical chord type through Open Sound Control.

**Music****Harmonia – Illiac Software (US)***Marketing for the Great China Area***Jan 2020 - Present****Urbana, IL**

- Taking responsibility of the product localization and marketing in the Great China area for the state-of-the-art music harmony education software ([harmonia.illiacsoftware.com](http://harmonia.illiacsoftware.com)) created by Heinrich Taube.
- Presenting software demo and effectively reach hundreds of target users at the 8<sup>th</sup> Conference on Sound and Music Technology (CSMT) in China.

**Spaceport Record (JP)***Composer, Songwriter***Apr 2021-Present****Tokyo, Japan**

- Collaborated with famous lyric writers, arrangers, and singers from Japan and China to create commercial music.
- Mainly taking charge of melody writing, harmony designing, mixing strategy designing, and midi production.

**Independent Music Producer***Music Producer, Music Theory & Technology Key opinion leader, Teacher***Feb 2016 - Present****Freelance**

- Owned an artist label 本尼桑 (Benny san) on social media called Zhihu with 46,000+ followers.
- Wrote articles on jazz improvisation, music theory and music technology, had 1,000,000+ views.
- Composed commercial music in Jazz, J-pop, C-pop, EDM, Game Background Music Style.

**UIUC ACG Piano Improv & Composition Club***President, Founder, Lecturer***Aug 2019 – Feb 2020****Champaign, IL**

- Held weekly workshops teaching Japanese POP music theory, Computer Music technique, Instrumentation technique, Vocaloid editing techniques, Mixing technique to 169 registered members.
- Closed due to COVID-19

**Shenzhen College of international education official school anthem project***Director, Composer***Dec 2017 - Jun 2018****Shenzhen, China**

- Led 50 high school students to compose, record, and mix an official school anthem
- Coordinated human resource, composition, lyrics writing, and staging for live performance at the Shenzhen Grand Theater hosting 600+ audience

**PUBLICATIONS****Musical Information Retrieval**

- Wang, Z., Li, J., Chen, X., Li, Z., **Zhang, S.**, Han, B., & Yang, D. (2019). Musical Instrument Playing Technique Detection Based on FCN: Using Chinese Bowed-Stringed Instrument as an Example. *arXiv preprint arXiv:1910.09021*.
- Wang, Z., **Zhang, S.**, & Chen, X. (2020). Exploring Inherent Properties of the Monophonic Melody of Songs. *arXiv preprint arXiv:2003.09287*.

**MUSIC PRESENTATIONS****(2021) Electroacoustic composition: Mutant**, U of I Composer forum**Urbana, IL****(2021) Electroacoustic composition: Evolved**, U of I Composer forum**Urbana, IL****(2019) Piano: Improvisation with quartal harmony & gypsy scales**, Student Composer Concert**Urbana, IL****(2018) Piano performance: SCIE school anthem**, Shenzhen Grand Theater**Shenzhen, China****CONFERENCE & MEMBERSHIPS**

- Membership in Society of Music Perception and Cognition 2019 - 2021
- Membership in Society of Music Theory 2019 - 2021
- Attendance in 21<sup>st</sup> International Society for Musical Information Retrieval Conference 2020
- Attendance in 2020 Audio Developer Conference 2020

## HONORS

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- University of Illinois Edmund James Scholar Honor Program
- University of Illinois Dean's list
- Waterloo Euclid Mathematics Competition, top 25%

2019 - 2021  
2019 - 2021  
June 2017

## SKILLS

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### Computer Science

- Proficient in C++ (JUCE) and Python (NumPy, Matplotlib, Pandas, PyTorch, SciPy, Seaborn, Scikit-learn, PyQt)
- Intermediate in C, Java, OCAML, Git, Command line, Linux, SQL, Flask

### Music

- Logic Pro, Fl Studio, Audacity, SPEAR, SuperCollider, GRACE, Reaper, MuseScore, Vocaloid, Kontakt, FabFilter, Waves
- Composition & Improvisation in Jazz, Japanese pop, Chinese pop, Electronic Dance Music
- Piano (8 years), Guitar (2 years), Violin (2 years), Drum (months)

### Psychology

- Experienced in MNE-Python and SciPy

### Miscellaneous

- LaTeX, Adobe Photoshop, Adobe Premier Pro, Microsoft Office, and Chinese Cuisine

## HOBBIES

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I like landscape photographing, cat videos, RAYARK music rhythm games, and road cycling in my spare time. Walking a trip in random cities is also my favorite.