GUO ZIXUN NICOLAS

Email: nicolas.guozixun@gmail.com
Github: github.com/guozixunnicolas
Mobile: +65-8262-9906
LinkedIn: linkedin.com/in/nicolas-guozixun/
Website: guozixunnicolas.github.io/

Education

- **Nanyang Technological University (NTU), Singapore** Aug 2016 - Jun 2020
  BEng Electrical and Electronic Engineering (Highest Distinction Honors); CGPA:4.74/5.00
- **KTH Royal Institute of Technology, Sweden** Aug 2018 - Jan 2019
  Overseas exchange program in the School of Electrical Engineering and Computer Science

Research Experience

- **AMAAI Lab, Singapore University of Technology and Design (SUTD)** Aug 2020 - Present
  Senior Research Assistant (Full-time)
  - **Topic**: Sound and Music Modeling, Music Emotion Analysis; Supervised by Prof. Dorien Herremans
- **Digital Signal Processing Lab, Nanyang Technological University (NTU)** Aug 2019 - Jun 2020
  Research Student (Thesis)
  - **Topic**: Neural Sound Generation; Supervised by Prof. Gan Woon-Seng
- **Speech and Language Lab, Nanyang Technological University (NTU)** Apr 2019 - Aug 2019
  Research Intern
  - **Topic**: Deep Speech Data Augmentation; Supervised by Prof. Chng Eng Siong
- **Desay SV Automotive, Singapore** Jan 2019 - Apr 2019
  Research Intern
  - **Topic**: Self-driving; Automatic Lane Detection; Supervised by Dr. Wu Xiaojun

Industrial Experience

- **Mercury Orbit Music, United States** Jan 2023 - Present
  Software Engineer (Part-time)
  - **Topic**: Automatic Music Generation

Publications

- **Z. Guo**, J. Kang and D. Herremans, "A Domain-Knowledge-Inspired Music Embedding Space and a Novel Attention Mechanism for Symbolic Music Modeling", in AAAI 2023.
- **Z. Guo** and D. Herremans, "Leveraging Music Domain Knowledge for Symbolic Music Modeling", in DMRN+17: Digital Music Research Network One-day Workshop 2022, Queen Mary University of London, 2022.
- **Z. Guo**, C. Chen and E. Chng, "DENT-DDSP: Data-efficient Noisy Speech Generator Using Differentiable Digital Signal Processors for Explicit Distortion Modeling and Noise-robust Speech Recognition", in INTERSPEECH 2022.
- **Z. Guo**, D. Makris and D. Herremans, "Hierarchical Recurrent Neural Networks for Conditional Melody Generation with Long-term Structure", in International Joint Conference on Neural Networks (IJCNN), 2021.
- **Z. Guo** and D. Herremans, "MotifNet: Towards Motif-based Music Generation Using An Attention-based Graph Neural Network", pre-print, 2022.
- D. Makris, **Z. Guo**, M. Kaliakatsos-Papakostas, D. Herremans, "Conditional Drums Generation Using Compound Word Representations", in EvoMUSART 2022.

Projects

- **The Use of Music for Reporting Mood in People with Autism** Aug 2021 - Present
  in collaboration with SingHealth and Duke NUS; Principal Music Composer

  Wrote music pieces with various valances, arousals and musical modes which convey different emotions and will be used to examine the effect of music in helping people with Autism.
- **Holistic Evaluation of Audio Representations (HEAR)** Jun 2021 - Jun 2022
  participated in the NeurIPS competition on behalf of SUTD AMAAI Lab

  Proposed a novel audio embedding method which is an ensemble of wav2vec, CREPE and DDSP.
- **Neural Environmental Sound Generation** Apr 2019 - May 2020
  NTU Final Year Project; Best Final Year Project Award; Supervisor: Prof. Gan Woon-Seng

  Developed a novel conditional SampleRNN architecture which is able to generate environmental sound with text inputs as conditions.
- **Guitar Effect Simulator using Raspberry Pi with a Web Controller** Jan 2020 - May 2020
  NTU Design and Innovation Project; Project initiator and team leader of 5

  Developed a guitar effect simulator which contains various settings (e.g., equalizer, reverb, delay) controlled by a self-designed web controller using Raspberry Pi.
- **FM synthesizer using NI MyRio** Jan 2020 - May 2020
  NTU Embedded System Course Project

  Developed an embedded FM (frequency modulation) synthesizer using NI MyRio which is able to synthesize musical sounds of various instruments such as bassoon, clarinet, drum.

Awards and Prizes

- **Defence Science & Technology Agency Gold Medal** (NTU Best Final Year Project Award 2020, Top 1).
- **NTU Science and Engineering Scholarship** (Full scholarship for a 4-year undergraduate program).
- **ST engineering book prize** (Highest marks in the course: Embedded Systems).
- **Motorola book prize** (Highest marks in the course: Digital Communications).
- In the **Dean's List (NTU)** in Academic Year 2016 - 2017, 2019 - 2020 (Top 5%).

Skills and Strengths

- **Languages**: Python, C, Matlab, Labview
- **Frameworks:** Tensorflow, Pytorch
- **Tools:** Overleaf, Latex, Docker, Git, Puredata
- **Music:** Songwriting, Music Theory, Improvisation

Academic Service

- **Project Supervision:** Undergraduate Research Opportunities Program (UROP), SUTD in AY2022-2023
- **Reviewer:** AI Music Creativity (AIMC), IEEE Access
- **Teaching:** Teaching Assistant for Computational Data Science, SUTD in AY2020-2021
- **Volunteering**: ICASSP 2022