

YOURUI GUO

yourui@ualberta.ca ◊ 780-729-3565 ◊ github.com/YouruiGuo

EDUCATION

University of Alberta

Thesis-based M.Sc in Computing Science

September 2018 - November 2020

University of Alberta

B.Sc in Computing Science with Honors Program

September 2015 - June 2018

Beijing University of Chemical Technology

Computer Science and Technology (First and Second Years)

September 2013 - June 2015

TECHNICAL STRENGTHS

Computer Languages Knowledge

Python, JavaScript, C/C++, HTML/CSS, SQL, shell, C#, JAVA
Reinforcement Learning, Supervised Learning, Single Agent Search,
Database Management, Web Application Development

Software & Tools

Linux, Git, Node.js, Web Audio API, Django,
Sails.js, MySQL, MongoDB, PyTorch

WORK EXPERIENCE

Music Department, University of Alberta

Research Assistant

Oct 2020 - present

- As a principal designer of the system, I implement the web application that plays soundscapes from the web pages using Node.js and JavaScript Selenium, as well as integrate hardware such as the webcam and Arduino pulse sensor into the software.
- The system aims at seeking therapeutic soundscapes in a soundscape library that elicit relaxations in critically ill patients. The system learns to select soundscapes according to heart rate obtained from the patient as heart rate is able to indicate how stressed the patient is.

PROJECTS

Sound Relaxation Exploration using Reinforcement Learning (Master thesis)

The problem was defined to determine the subjects' preferences for soundscapes that were able to increase their relaxation levels. I addressed the problem with two methods: a traditional search method (real time A*) where the state space was formed as a n-dimensional grid world; and a multi-armed bandit algorithm (UCT) built on a hierarchical tree structure. I compared two methods in simulated experiments and UCT outperformed real time A*. Experimental results on the UCT algorithm were obtained with volunteer subjects.

Sounding the Islamic Garden

The goal of this project was to design a web-based application that provided users with a location-dependent sonic experience in the Islamic Garden. As they walked through the garden, they would hear a mix of Iranian classical music: the ambient track, overlaid by located sounds, whose intensity varies according to the visitor's distance from the source. The system tracked a user's location, and mixed sounds in real-time according to where the user currently was within the garden space. Users were able to read information about each track, and listen to any track in "solo" mode or mute any track.

Deep Learning for Sound Recognition

– Music Classification According to Cantometrics Features

The project aimed at classifying folk music according to Cantometrics features developed by Alan Lomax. Cantometrics described traditional music from around the world using 37 factors such as nasality, accent and melodic shape. The training data included a library of folk music tracks and a metadata sheet that recorded Cantometrics features as well as music information including regions and cultures. The project developed a classifier (convolutional neural network) to classify folk music based on nasality and region where music tracks were turned into spectrograms for input to the classifier.

PRESENTATIONS AND POSTERS

- Matt Kelley, Sergio Hernandez, Michael Frishkopf, Noah Weninger, Yourui Guo. *“Deep Learning for Sound Recognition”*. The Society for Ethnomusicology 63rd Annual Meeting. Albuquerque, New Mexico. November 2018.
- Yourui Guo. *“Sound Relaxation: “Sweet Spot” Exploration in Soundscapes using Reinforcement Learning”*. Reverse EXPO. University of Alberta. February 2020.

EXTRA-CURRICULAR

- Won sixth Place in Rocky Mountain Regional International Collegiate Programming Contest (ICPC) in November 11, 2017.
- Won fifth Place in the University of Alberta Programming Contest in 2016.
- Joined University of Alberta Mixed Chorus and Hand-bell Ringers in 2015.
- Co-organized Acapella group at Beijing University of Chemical Technology in 2014.

PERSONAL TRAITS

- Highly motivated and excited to learn new technologies.
- Adept at tackling problems with ease and thinking independently.
- Ability to work as an individual as well as in group.