

# Chen Liang

☎ (412) 961 4600  
✉ [hi@liangchen.email](mailto:hi@liangchen.email)  
📄 [liangchen.soy/eng/](http://liangchen.soy/eng/)  
Carnegie Mellon University



*To obtain a position where I can utilize software engineering expertise.*

## Education

### In Progress

2014  
2017

**MSc in Music and Technology**, Carnegie Mellon University, Pittsburgh.  
Expected Graduation: August, 2017

### Completed

2010  
2014

**BSc in Electrical Engineering**, Beihang University, Beijing, China.

## Relevant Courses

- Advanced Digital Signal Processing
- Machine Learning and Pattern Recognition
- Principles of Software System Construction
- Data Structures and Algorithms

## Skills

### Programming Languages

**General** Java, C++, Python

**Music** Chuck, Pure Data

**Math** Matlab

**Other** Processing, D3.js

### Digital Audio Workstation

Audacity, Pro Tools, Ableton Live, GarageBand

## Experience

2015  
2017

**Recording Engineer**, The Vlahakis Recording Studio, Pittsburgh, U.S.

- Recorded music performances and studio albums for local bands and individual musicians in Pittsburgh

2017

**Research Assistant**, Gut Sound Project, Pittsburgh, U.S.

- Assisted Prof. Ali Momeni to design and implement a microphone amplifier to capture sounds in the human gut.

2015

**Intern**, Musixmatch, Bologna, Italy.

- Studied and visualized the relations between lyrics & history, music & emotion using D3.js.

## Projects

2016  
2017

### **The Evaluation of Score Following Systems.**

Score following is a technique to track the position of music performance on a musical score in real-time, and is the topic of my master degree thesis.

- Developed a HMM-based score following system;
- Developed an intuitive Bayesian-based score following system;
- Successfully followed monophonic MIDI performances with an average note-level onset error within 100ms;
- Introduced an evaluation framework for the comparison of score followers.

2016

### **A Distributed Map/Reduce Framework.**

Map/reduce is a programming model to process large amount of data sets. A map/reduce framework was implemented and simple map/reduce tasks were also implemented to use this framework.

- A client, a master server and multiple worker servers were designed in the framework;
- A distributed storage system was not provided but assumed by the framework; data was partitioned and each partition was assigned to several worker servers to handle worker server failures;
- Tasks such as 'suggesting words based on word prefixes' were solved on the framework.

2015

### **A Lyrics and Music Alignment System.**

This is a side project inspired by the study into HMM algorithms. The goal is to align popular music recordings with music subtitles word-by-word.

- Used polyphonic music with lead vocals, and lyrics without errors as input;
- Used Hidden Markov models trained with speech dataset instead of singing dataset;
- Implemented the GUI with Python.

2015

### **Accelerometer Data based Individual Verification.**

The specific way people walk could turn out to be as unique between people as their fingerprint, and this could be used as a new method of individual verification.

- Extracted single steps from raw 3-D data with Principal Component Analysis;
- Tested different correlation filter to verify a specific pattern of a person.

2015

### **Your Keyboard is NOT Your Friend - Snooping of Audio Recordings of Typing.**

The recording of typing may reveal the texts behind it. Our project implemented an attack given the hypothesis that the sounds made by distinct keys are different enough to be differentiated, without training on the specific keyboard.

- Recorded the sound of keystrokes when typed slowly;
- Divided the recording into a sequence of separate keystrokes;
- Extracted binned-FFT as our features and run feature clustering;
- With prior transition probability provided by large English corpus, we modeled the decryption procedure with Hidden Markov Models;
- Word-level similarity between the reconstructed text and the reference text is 65%.