# TEERAPAT JENRUNGROT Al Researcher (Audio/Computer Vision)

https://mjenrungrot.com

Pill & Melinda Gates Center, 3800 E Stevens Way NE, Seattle, WA 98195



## **EDUCATION**

### 2019 - current University of Washington, Seattle, WA

Ph.D. Student in Computer Science and Engineering (GPA: 3.97/4)

- > Advisors: Ira Kemelmacher-Shlizerman, Steve Seitz
- > Affiliations: UW Reality Lab, UW Graphics and Imaging Lab (GRAIL)
- > Research Interest: Audio-visual, Deep Learning, Music Information Retrieval

#### 2015 - 2019 Harvey Mudd College, Claremont, CA

Bachelor of Science in Computer Science (GPA: 3.8/4, CS GPA: 3.87/4)

> Graduated with High Distinction and Departmental Honors in Computer Science.



# **EXPERIENCE**

# Current September 2019

# University of Washington

Research Assistant

> Audio Source Separation: Developed a novel method for speech separation using deep learning. Our method illustrates state-of-the-art separation performance, works with real-world voices, and handles arbitrary, unknown number of potentially moving speakers. We published our work as an oral paper in NeurIPS 2020.

Project Page: Here

Python Pytorch

# August 2019

Amazon.com, Inc.

Seattle, WA

Seattle, WA

May 2019

Applied Scientist Intern, Customer Behavior Analytics Team

- > Customer Segmentation: Developed a semi-supervised deep learning algorithm for clustering highdimensional customer data using Python and MXNet Gluon. The proposed method improved clustering performance by 26% and is deployed to production for improving customer's downstream impact estimation.
- > Distributed Deep Learning: Developed a pipeline for neural network distributed training and inference using Spark and Amazon EMR cluster.

Python MXNet PyTorch Amazon EMR Amazon EC2 Spark Hadoop

# May 2019 September 2018

### **Microsoft Corporation**

Redmond, WA

Remote Co-op Technical Consultant, Advanced Reading Technologies Team

- > Reading Tool: Collaborated with a research team from Microsoft Research on a project of developing a reading tool for improving users' reading experience based on an eye-tracking device.
- > Eye-tracking Data Analysis: Developed an automated system to detect and classify points of interest based on user reading behavior into interested, confused, and skimming categories using Python.

Python JavaScript Flask

# May 2019 January 2016

# Harvey Mudd College

Claremont, CA

Research and Teaching Assistant

- > Research Assistant Music Information Retrieval: Developed a dynamic programming algorithm for multi-modal alignment between sheet music and corresponding computer-synthesized MIDI. Designed a deep fully convolutional network for detecting musical notes on sheet music and generating compact representations for the alignment using Python, Keras, and Tensorflow. Our method is published in ISMIR 2019.
- > Research Assistant PCB Developer: Designed and developed a PCB consisting of a microcontroller SAM4S and a Cyclone IV FPGA to be used in a microprocessor-based systems class and created lab instructions based on the developed PCB. Our work is published in GLSVLSI 2020.
- > Research Assistant Stock Market Analysis: Applied machine learning techniques to detect anomalies in stock market data. Developed a backtesting system and an actual automated trading system that connects to InteractiveBrokers for real-time trading. Developed the distributed system and frontend using Python, Django, and Celery for parallelization.
- > Teaching Assistant: Tutored students, held office hours, graded students' homework for Machine Learning, Big Data, and Microprocessor-based Digital System.

Python C/C++ Keras Tensorflow Django Quartus

# August 2017

# May 2017

Intel Corporation

Santa Clara, CA

Remote Summer Research Assistant

- > Proposed a computational model for sound field separation and reconstruction of a 3-dimensional acoustic environment.
- > Designed a headphone-based system to simulate 3-dimensional sound localization effects using Head-Related Transfer Functions using Python.

Pvthon

# May 2017

### Environmental Data Resources (EDR), Inc.

Shelton, CT

January 2017 | Remote Part-Time Software Developer

> Implemented a Hidden Markov model and support vector machine model for automatically parsing US addresses into computer-readable formats.

Python C/C++ scikit-learn



# Publications

### THE CONE OF SILENCE: SPEECH SEPARATION BY LOCALIZATION

2020

Proceedings of the 34th Conference on Neural Information Processing Systems (NeurIPS) [Oral Paper] **Teerapat Jenrungrot\***, Vivek Jayaram\*, Steven Seitz, Ira Kemelmacher-Shlizerman

Vancouver, Canada

PDF Code Project Page

### A BOARD AND PROJECTS FOR AN FPGA/MICROCONTROLLER-BASED EMBEDDED SYSTEMS LAB

2020

Proceedings of the 30th edition of the ACM Great Lakes Symposium on VLSI (GLSVLSI)

Beijing, China

 $Kaveh\ Pezeshki\ , Caleb\ Norfleet\ , Erik\ Meike\ , \textbf{Teerapat\ Jenrungrot}\ , Matthew\ Spencer\ , Joshua\ Brake\ , David\ M.\ Harris$ 

PDF Schematic Layout

### USING CELL PHONE PICTURES OF SHEET MUSIC TO RETRIEVE MIDI PASSAGES

2020

IEEE Transactions on Multimedia

TJ Tsai, Daniel Yang, Mengyi Shan, Thitaree Tanprasert, Teerapat Jenrungrot

PDF Code Data

### MIDI PASSAGE RETRIEVAL USING CELL PHONE PICTURES OF SHEET MUSIC

2019

Proceedings of the 20th Conference of the International Society for Music Information Retrieval (ISMIR) Daniel Yang, Thitaree Tanprasert, **Teerapat Jenrungrot**, Mengyi Shan, TJ Tsai

Delft, the Netherlands

PDF Code Data Talk

### MIDI-SHEET MUSIC ALIGNMENT USING BOOTLEG SCORE SYNTHESIS

2019

Proceedings of the 20th Conference of the International Society for Music Information Retrieval (ISMIR) Thitaree Tanprasert\*, **Teerapat Jenrungrot**\*, Meinard Müller, Timothy Tsai

Delft, the Netherlands

PDF Code Talk



### **COCONUT ONLINE INTERPRETER**

2018

Python JavaScript React Flask Amazon Lambda CI/CD

## FPGA-BASED CRYPTOCURRENCY PLATFORM

2017

github.com/fangherk/MicroPCoin

Designed and implemented a simulated cryptocurrency platform with hash computations by FPGA using Raspberry Pi, C, Flask, and SystemVerilog.

Python C/C++ SystemVerilog Flask FPGA Raspberry Pi



November 2018 5<sup>th</sup> Place, ACM-ICPC Southern California Regional 2018

March 2018 Honorable Mention, North American Invitational Programming Contest 2018

November 2017 5<sup>th</sup> Place, ACM-ICPC Southern California Regional 2017

September 2017 1st Place, Microsoft Coding Competition (MSFT3C) - Harvey Mudd College

November 2016 9<sup>th</sup> Place, ACM-ICPC Southern California Regional 2016 November 2015 7<sup>th</sup> Place, ACM-ICPC Southern California Regional 2015

May 2014 Honorable Mention, Asia-Pacific Informatics Olympiad 2014
May 2013 1st Place/Gold Medal, Thailand Olympiad in Informatics 2013

**SKILLS** 

Programming Python, Spark, C/C++, JavaScript, FFX, SystemVerilog, Tensorflow, Keras, MXNet, PyTorch

Services Amazon EC2, Amazon EMR, Amazon S3, Amazon Lambda, CI/CD

Web Development Node.JS, Django, Flask, Redux, React, HTML5