# 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

May 2019

Amazon.com, Inc.

Seattle, WA

Seattle, WA

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

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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

## Harvey Mudd College

Claremont, CA

January 2016 Re

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.

Python

# 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, 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

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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 2012 1st Place (Cold Model, Theiland Olympiad in Informatics 2014)

May 2013 1st Place/Gold Medal, Thailand Olympiad in Informatics 2013



Programming Python, Spark, C/C++, JavaScript, ŁawaScript, ŁawaScri

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

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