Teerapat Jenrungrot
AI Researcher (Audio/Computer Vision)

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🎓 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 · Seattle, WA
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
Applied Scientist Intern, Customer Behavior Analytics Team
> **Customer Segmentation**: Developed a semi-supervised deep learning algorithm for clustering high-dimensional 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 front-end 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 January 2017	**Environmental Data Resources (EDR), Inc.** Shelton, CT 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] — Vancouver, Canada

Teerapat Jenrungrot∗ , Vivek Jayaram∗ , Steven Seitz , Ira Kemelmacher-Shlizerman

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) — Delft, the Netherlands

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

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) — Delft, the Netherlands

Thitaree Tanprasert∗ , **Teerapat Jenrungrot**∗ , Meinard Müller , Timothy Tsai

PDF | Code | Talk

💻 Projets

Coconut Online Interpreter   2018
🔗 https://cs121-team-panda.github.io/coconut-interpreter/   ⊙ github.com/cs121-team-panda/coconut-interpreter
Designed and implemented a web-based online interpreter for the open-source Coconut programming language using Flask, React, and AWS Lambda. Built fully automated CI/CD pipelines on CircleCI.

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

✹ Honors

November 2018	**5th Place**, ACM-ICPC Southern California Regional 2018
March 2018	**Honorable Mention**, North American Invitational Programming Contest 2018
November 2017	**5th Place**, ACM-ICPC Southern California Regional 2017
September 2017	**1st Place**, Microsoft Coding Competition (MSFT3C) - Harvey Mudd College
November 2016	**9th Place**, ACM-ICPC Southern California Regional 2016
November 2015	**7th 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, LaTeX, 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