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