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

Publications

The Cone of Silence: Speech Separation by Localization 2020
Teerapat Jenrungrot∗ , Vivek Jayaram∗ , Steve Seitz , Ira Kemelmacher-Shlizerman
Proceedings of the 34th Conference on Neural Information Processing Systems (NeurIPS) [Oral Paper]
Project Page | Code | PDF

A Board and Projects for an FPGA/Microcontroller-Based Embedded Systems Lab 2020
Kaveh Pezeshki , Caleb Norfleet , Erik Meike , **Teerapat Jenrungrot** , Matthew Spencer , Joshua Brake , David M. Harris
Proceedings of the 30th edition of the ACM Great Lakes Symposium on VLSI (GLSVLSI)
Schematic | Layout | PDF

Using Cell Phone Pictures of Sheet Music To Retrieve MIDI Passages 2020
TJ Tsai , Daniel Yang , Mengyi Shan , Thitaree Tanprasert , **Teerapat Jenrungrot**
IEEE Transactions on Multimedia
PDF | Code | Data

MIDI Passage Retrieval Using Cell Phone Pictures of Sheet Music 2019
Daniel Yang , Thitaree Tanprasert , **Teerapat Jenrungrot** , Mengyi Shan , TJ Tsai
Proceedings of the 20th Conference of the International Society for Music Information Retrieval (ISMIR)
PDF | Code | Data | Talk

MIDI–Sheet Music Alignment Using Bootleg Score Synthesis 2019
Thitaree Tanprasert∗ , **Teerapat Jenrungrot**∗ , Meinard Müller , and Timothy Tsai
Proceedings of the 20th Conference of the International Society for Music Information Retrieval (ISMIR)
PDF | Code | Talk

Experience

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.
- **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.
- **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

Projets

Fast KDE with Error Guarantees — 2019

Implemented a non-parametric approach for performing kernel density estimation using the nearest neighbor data structure Kd-tree. Evaluated the proposed method by comparing with the state-of-the-art baseline kernel density estimator.

C/C++ | Python

Quantifying Information Gain in Infinite Space — 2018

Developed a theoretical framework used for quantifying an information gain when transitioning from infinite space to finite space by using cumulative distribution functions. Demonstrated the proposed framework on the decision tree algorithm.

Python

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