Teerapat **Jenrungrot**

Computer Vision Researcher · Ph.D. Student

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Education

University of Washington

Seattle, Washington

Ph.D. in Computer Science and Engineering — *Exp. Sep. 2019 - Exp. Jun. 2024*

- Starting in Autumn Quarter 2019

Harvey Mudd College

Claremont, California

B.Sc. in Computer Science — *Aug. 2015 - Exp. May. 2019*

- Cumulative GPA: 3.79/4.00, CS GPA: 3.91/4.00

Publications

Preprint

2018 **MIDI-Sheet Music Alignment Using Bootleg Score Synthesis**, Submitted to 2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP). *[PDF]*

2018 **Audio-Sheet Music Alignment using Soft Bootleg Score Synthesis**, Preprint *[PDF] [Code]*

Work Experience

Microsoft Corporation

Seattle, Washington

Co-op Technical Consultant (Remote) — *Sep. 2018 - PRESENT*

- 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.
- Developed an automated system to detect and classify points of interest based on user reading behavior into interested, confused, and skimming categories.
- Worked remotely with a team of 5 students as a part of senior capstone project advised by Professor Julie Medero from HMC CS department and a liaison from Microsoft, Rob McKaughan.

Harvey Mudd College, Engineering Department

Claremont, California

Research Assistant — *Jan. 2017 - PRESENT*

- Developed a dynamic programming algorithm for aligning between sheet music and a computer-synthesized audio signal in MIDI format.
- Designed a deep fully convolutional network for detecting musical notes on sheet music and creating useful representations for the alignment.
- Fine-tuned the network with real scanned sheet music to handle both scanned and computer-generated sheet music.
- The project is supervised by Professor Timothy Tsai from HMC Engineering Department.

Harvey Mudd College, Engineering Department

Claremont, California

PCB Developer · Lab Assistant — *Sep. 2017 - May. 2018*

- 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.
- The project is supervised by Professor David Money Harris from HMC Engineering Department and Professor Matthew Spencer from HMC Engineering Department.

Intel Corporation

Santa Clara, California

Summer Research Assistant · Remote Technical Consultant — *May. 2017 - Aug. 2017*

- 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.
- The project is supervised by Professor Weiqing Gu from HMC Mathematics Department in collaboration with Intel's researchers.

Environmental Data Resources (EDR), Inc.

Shelton, Connecticut

Remote Software Developer — *May. 2017 - Aug. 2017*

- Implemented a Hidden Markov model and support vector machine model for automatically parsing US addresses into computer-readable formats.
- The project is supervised by Professor Weiqing Gu from HMC Mathematics Department in collaboration with EDR's liaisons.

Harvey Mudd College, Computer Science Department

Claremont, California

Software Developer

Jun. 2016 - May. 2017

- Developed an interactive visualization using D3.js for showing data of schools within California for non-profit organization STEAM:CODERS to promote computer science to underrepresented groups.
- Volunteered to improve CSS and JavaScript on Turning Green's website for interactive user experience to advocate for environmental initiatives in US colleges.

Harvey Mudd College, Mathematics Department

Claremont, California

Software Developer

May. 2016 - Aug. 2016

- 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.
- The project is supervised by Professor Weiqing Gu from HMC Mathematics Department.

Projects

Machine Learning Research: Fast Kernel Density Estimation with Error Guarantees

Claremont, California

Technical Lead

Jan. 2019 - PRESENT

- 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.
- The project is supervised by Professor George Montanez from HMC Computer Science Department.

Machine Learning Research: Quantifying Information Gain in Infinite Space

Claremont, California

Technical Lead

Aug. 2018 - Dec. 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.
- The project is supervised by Professor George Montanez from HMC Computer Science Department.

Computer Vision Research: Mouth Shape Analysis

Claremont, California

Technical Lead

Jan. 2018 - May. 2018

- Developed a computational framework using deep convolutional networks to analyze human mouth shapes.
- Tested the developed system with video stream data.
- The project is supervised by Professor Zachary Dodds from HMC Computer Science Department.

Machine Learning Research: Quantifying Information Gain in Infinite Space

Claremont, California

Technical Lead

Aug. 2018 - Dec. 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.
- The project is supervised by Professor George Montanez from HMC Computer Science Department.

Software Development: Coconut Online Interpreter

Claremont, California

Software Developer

Jan. 2018 - May. 2018

- 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.
- The application is accessible online at `https://cs121-team-panda.github.io/coconut-interpreter/`.

Software Development: Simplieifed Virtual Private Network (VPN)

Claremont, California

Software Developer

Jan. 2018 - May. 2018

- Implemented a simplified system of SSL Virtual Private Network. Simulated the implementation in virtual machines.
- The application is accessible online at `https://github.com/mjenrungrot/vpn`.

Hardware Development: FPGA-based Cryptocurrency Platform

Claremont, California

Software Developer · FPGA Designer

Sep. 2017 - Dec. 2017

- Designed and implemented a simulated cryptocurrency platform with hash computations by FPGA using Raspberry Pi, C, Flask, and SystemVerilog.
- The application is accessible online at `https://github.com/fangherk/MicroPCoin`.

Honors & Awards

Programming Competitions

Nov. 2018	**5th Place**, ACM-ICPC Southern California Regional 2018	*California, USA*
Mar. 2018	**Honorable Mention**, North American Invitational Programming Contest 2018	*Illinois, USA*
Nov. 2017	**5th Place**, ACM-ICPC Southern California Regional 2017	*California, USA*
Sep. 2017	**1st Place**, Microsoft Coding Competition (MSFT3C) - Harvey Mudd College	*California, USA*
Nov. 2016	**9th Place**, ACM-ICPC Southern California Regional 2016	*California, USA*
Jun. 2016	**Top 500**, Google Distributed Code Jam 2016 (Round 2)	*California, USA*
Nov. 2016	**Honorable Mention**, North American Invitational Programming Contest 2016	*Illinois, USA*
Nov. 2015	**7th Place**, ACM-ICPC Southern California Regional 2015	*California, USA*
Sep. 2015	**1st Place**, Microsoft Coding Competition (MSFT3C) - Harvey Mudd College	*California, USA*
Jan. 2015	**Top 1000**, Facebook Hacker Cup 2015 (Round 2)	*California, USA*
May. 2014	**Honorable Mention**, Asia-Pacific Informatics Olympiad 2014	*Almaty, Kazakhstan*
May. 2013	**1st Place/Gold Medal**, Thailand Olympiad in Informatics 2013	*Bangkok, Thailand*
May. 2012	**Gold Medal**, Thailand Olympiad in Informatics 2012	*Bangkok, Thailand*
May. 2011	**Silver Medal**, Thailand Olympiad in Informatics 2011	*Bangkok, Thailand*

Skills

Programming	Python, Node.JS, Matlab, C/C++, LaTeX, Haskell, SystemVerilog
Web	Django, Flask, Redux, React, HTML5
Languages	English, Thai, Japanese