Thitaree Tanprasert

Personal Information

Date of Birth:	October 24, 1996	Phone:	+1 778 814 0463
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Education

Current	Doctoral of Philosophy Computer Science **University of British Columbia**, Vancouver, British Columbia
May 2019	Bachelor of Science Joint Major in Computer Science and Mathematics **Harvey Mudd College**, Claremont, California GPA: 3.82/4.00 (Major GPA: 3.80/4.00)

Publications

TJ Tsai, Daniel Yang, Mengyi Shan, Thitaree Tanprasert, Teerapat Jenrungrot. (2020) Using cell phone pictures of sheet music to retrieve MIDI passages. *IEEE Transactions on Multimedia (Volume: 22, Issue: 12, Dec. 2020)*. Link to paper

Thitaree Tanprasert, Dongwook Yoon. (2022) AR Music Visualizers: Application Space and Design Guidelines. *ACM CHI Conference on Human Factors in Computing Systems, CHI 2022*.

Thitaree Tanprasert, Sidney Fels, Luanne Sinnamon, Dongwook Yoon. (2022) Authoring Virtual Peer Interactions for Lecture Videos. *ACM CHI Conference on Human Factors in Computing Systems, CHI 2022*.

Thitaree Tanprasert, Daniel Yang, Teerapat Jenrungrot, Mengyi Shan, TJ Tsai. (2019) MIDI Passage Retrieval Using Cellphone Pictures of Sheet Music. *The 20th Annual Conference of International Society for Music Information Retrieval, ISMIR 2019*. Link to paper, Talk video

Thitaree Tanprasert, Teerapat Jenrungrot, Meinard Mueller, TJ Tsai. (2019) MIDI-Sheet Music Alignment Using Bootleg Score Synthesis. *The 20th Annual Conference of International Society for Music Information Retrieval, ISMIR 2019*. Link to paper

Thitaree Tanprasert, Chalermpol Saiprasert, Suttipong Thajchayapong. (2017). Combining Unsupervised Anomaly Detection and Neural Networks for Driver Identification. *Journal of Advanced Transportation, Vol. 2017*. Link to paper

Research Projects

Current - June 2021

Authoring Scripted Interactions for Lecture Videos

University of British Columbia

This project proposes embedding scripted interactions of virtual characters into lecture videos to increase the learning gain via vicarious learning. I conducted a need-finding interview with instructors to design the scripted interactions as well as to develop guidelines for designing their authoring tool. This project is supervised by Professor Dongwook Yoon as a part of ViDeX research lab.

Research Projects (Continued)

Current - January 2020

Qualitative Studies of Video-based Music Learning

University of British Columbia

This project aims to study how people learn to play music instruments from free videos, create a set of guidelines for making good tutorial videos, and identify the learner's challenges as well as presenting their implications of design. I conducted an online interview and diary study with 20 participants, performed qualitative data analysis, and implemented Proof-of-Concepts interfaces for design implications. This project is supervised by Professor Dongwook Yoon. (Journal paper is in preparation.)

October 2018 - May 2018

MIDI Passage Retrieval Using Cellphone Pictures of Sheet Music

Music Information Retrieval Lab, Department of Engineering, Harvey Mudd College

This project aims to retrieve a passage of a MIDI performance of a musical piece based on cellphone image query of a part of sheet music. I created and annotated a new multimodal musical dataset for system evaluation. I ran experiments to improve the proposed system and wrote the conference paper for this project as the first author. (Link to paper can be found in the Publications section.) This project is supervised by Professor Timothy Tsai.

April 2019 - January 2019

MIDI-Sheet Music Alignment Using Bootleg Score Synthesis

Music Information Retrieval Lab, Department of Engineering, Harvey Mudd College

This project aims to synchronize scanned sheet music to a MIDI performance of the same piece, using deep learning. I created and annotated a new multimodal musical dataset for system evaluation. I implemented the baseline system, which involved optical music recognition, MIDI and audio feature extraction, and audio alignment using dynamic time-warping technique. I ran experiments to improve the proposed system and wrote the conference paper for this project as the first author. (Link to paper can be found in the Publications section.) This project is supervised by Professor Timothy Tsai.

April 2021 - January 2021

Exploring Application Space of AR Music Visualizers

CPSC554Y: Designing Augmented and Virtual Reality Experiences, University of British Columbia

This project aims to investigate the applications and potential benefits of augmented-reality (AR) music visualizers as well as to develop guidelines for designing such applications. I interviewed expert developers and researchers in the field and performed qualitative analysis to derive the findings. This project is supervised by Professor Dongwook Yoon. (Extended abstract is in currently in submission.)

May 2018 - February 2017

Live-Song Identification Project

Music Information Retrieval Lab, Department of Engineering, Harvey Mudd College

This project aims to retrieve song name based on a six-second query of live performance. I experimented with various architectures of neural nets (e.g. MLP, CNN, RNN) in Tensorflow and ran simulations with GPU on XSEDE supercomputer. I also performed literature search and implemented several hashing methods in Matlab and Python. This project is supervised by Professor Timothy Tsai.

May 2019 - September 2018

Creating Spatialized Audio for Mixed-Reality Application

Intel Corporation

This project is a part of a year-long, capstone, team project at Harvey Mudd College, which aims to develop an audio system for Mixed-Reality (MR) iOS application. The system would capture the acoustics of the user's environment and playback audio in the MR scene as though they were in the same environment as the users. I worked on developing algorithm for acoustics modeling and incorporating the system with Google Resonance Audio and ARkit. As the project manager of a six-people team, my responsibilities also include scheduling meetings, arranging site-visits, doing paperwork, and communicating between team, advisor, and sponsor liaisons. This project is supervised by Professor Alfonso Castro in collaboration with liaisons from Intel Sports.

Research Projects (Continued)

July 2016 - June 2016

Combining Unsupervised Anomaly Detection and Neural Networks for Driver Identification

National Electronic and Computer Technology Center (NECTEC), Thailand

This project aims to identify driver's identity, based on stream of data from inertial sensors on smartphones, such as GPS and accelerometers. I analyzed the data, developed feature extraction scheme, and trained neural network classification model in RapidMiner Studio. I also wrote the journal article for this project as the first author. (Link to paper can be found in the Publications section.) This project is supervised by Dr. Chalermpol Saiprasert and Dr. Suttipong Thajchayapong.

May 2014 - August 2013

A Heart-Rate-Controlled Animated Exercise Trainer using Neural-Network-Based Adaptive Control

Presented at 2014 Intel ISEF (Computer Science category)

This project aims to create an exercise trainer which adjusts exercise movements and intensity level based on user's real-time heart rate. I designed and implemented the main feedback control system, which consists of a feed-forward neural network, self-organizing feature maps, and a decision-making algorithm, all in Python. I also designed and created exercise animation using Blender, Panda 3D Module for controlling 3D animation and PyBluez for Bluetooth communication between Python program and Bluetooth heart rate detector. This project won second prize at Young Scientist Competition 2013 in Thailand and won Excellence in Computer Science award at Intel ISEF 2014.

May 2017 - March 2017

Audio Key Identification using Neural Networks on Pitch Profile

CS152: Neural Networks, *Harvey Mudd College*

Developed a system for identifying the key signature of polyphonic pop music. The system employs multi-layered perceptrons for classification tasks and several signal processing techniques, such as constant-Q transform, tuning pitch reference, and consonance filtering. [Link: `ttanprasert.github.io/cs152-final-project.pdf`]

July 2018 - May 2018

The Circuit Complexity of Recognizing Closed Sets and Performing Closure Operations

Department of Mathematics, Harvey Mudd College

This project aims to solve for lower bound of circuit complexity of recognizing closed sets and performing closure operations by combining the principle of local coding with enumeration of Boolean functions with entropy. Supervised by Professor Nicholas Pippenger.

December 2018 - September 2018

Problem Decomposition in Computer Programming and Spatial Reasoning

CS106: Computer Education Research, *Harvey Mudd College*

This project aims to understand the correlation of spatial reasoning and computer programming ability in introductory level CS through qualitative method. I designed and conducted interviews with CS students in my college and wrote a conference paper as a co-author. This research project is accepted through ACM Student Research Competition and will be presented at Special Interest Group on Computer Science Education (SIGCSE) Technical Symposium 2019.[Link to poster abstract: `ttanprasert.github.io/CSed_PosterAbstract.pdf`. Link to full paper submission can be found in Publications section.] This project is supervised by Professor Colleen Lewis.

May 2017 - March 2017

Analysis of Thai Traditional Tuning System in Comparison to Western Diatonic Scales

MUS95: Musical Mathematics, *Pomona College*

This project aims to study the relationship between Thai traditional tuning system and Western tuning system, and also proposes a table of conversion between the two tuning systems. I studied the characteristics of Thai tuning systems and proposed a formula for calculating similarity between all possible tuning systems in Thai music to seven Western diatonic scales. This project is supervised by Prof. C. Joti Rockwell

Work Experience

Current - January 2020
Research Assistant
University of British Columbia, Canada
Worked on Video-based Music Learning Project, Scripted Interactions for Lecture Videos Project, and AR Music Visualizer Project, supervised by Professor Dongwook Yoon.

Current - September 2019
Teaching Assistant
University of British Columbia, Canada
Tutored students and graded students' homework, projects, and exams for course CPSC312: Functional and Logic Programming and CPSC444: Advanced Methods for Human-Computer Interaction.

May 2019 - January 2017
Research Assistant
Music Information Retrieval Lab, Department of Engineering, Harvey Mudd College
Worked as a research lab member during the academic years (2016-2017, 2017-2018, 2018-2019) and for 10-week, full-time summer research internships in 2017 and 2018. I worked on the Live-Song Identification project and The MIDI-Sheet Music Alignment Using Bootleg Score Synthesis project. (Details about the projects can be found in the Research Projects section.) Additionally, I annotated audio and image data to create datasets for other projects in the lab. All work is supervised by Professor Timothy Tsai.

May 2019 - August 2016
Grader and Tutor
Harvey Mudd College
Tutored students and graded students' homework for the following Math, CS, and Physics classes: MATH030: Calculus, MATH040: Introduction to Linear Algebra, MATH045: Introduction to Differential Equations, MATH055: Discrete Mathematics, CSCI005: Introduction to Computer Science, CSCI042: Principles and Practice: Computer Science, CSCI060: Principles of Computer Science, CSCI081: Computability and Logic, CSCI131: Principles of Programming Language, PHYS023: Special Relativity, PHYS024: Mechanics and Wave Motion.

July 2016 - June 2016
Summer Research Assistant
National Electronic and Computer Technology Center (NECTEC), Thailand
Worked on the project Combining Unsupervised Anomaly Detection and Neural Networks for Driver Identification. (Details of the project can be found in the Research Project section.)

August 2015 - June 2015
Software Developer
Praram 9 Technology Co., Ltd.
Worked on Bizcard project to develop a smartphone application for electronic business card, where users can exchange cards through RFID communication. I developed and implemented the RFID communication via Arduino and the database for Bizcard users on the web server.

Competitions

May 2014 Excellence in Computer Science Award - Intel ISEF 2014
May 2014 Bronze Medal - The 10th Thailand Olympiad in Informatics 2014
May 2012 Bronze Medal - The 8th Thailand Olympiad in Informatics 2012

Skills

Programming: Python, C/C++, C#, Matlab, Java, Racket, Haskell, Prolog, Typescript, HTML
System: Using Unix system, MS Windows, run simulation with GPU on XSEDE.
Tools/Libraries: RapidMiner, Tensorflow, Keras, Unity, Blender, Maya, Librosa, Mido, D3 (Angular), Figma
Music: Playing piano, singing, composing and arranging, producing electronic music with Digital Performer 9 and Max 7.
Language: Thai (Native), English (Fluent), Korean (Basic knowledge)

Scholarships and Certificates

May 2019 - September 2015	Recipient of So International Scholarship, Harvey Mudd College 4 years (from academic year 2015-2016 to academic year 2018-2019.) This is a scholarship for international students with superior academic performance. The recipient is selected upon admission; one recipient for each entering class, regardless of financial status ($ 50,000/academic year.)
January 2015	Associate Trinity College London (ATCL) in Piano Recital (with Distinction) Level 4 Diploma in Music Performance Awarded by Trinity College London (ATCL)
July 2018	GRE General Test® Verbal Reasoning: 161/170 (88^{th} percentile); Quantitative Reasoning: 170/170 (96^{th} percentile); Analytical Writing: 4.5/6.0 (82^{th} percentile)
October 2018	TOEFL®: Reading: 30/30; Listening: 29/30: Speaking: 26/30; Writing: 30/30; Total: 115/120

Interests and Activities

acoustics analysis and modeling, algorithms, artificial, augmented reality, intelligence, computer music, fiction writing, human-computer interaction, machine learning, music composition and arranging, playing piano, signal processing, sound design. (In alphabetical order)