Ping-Chia (Amber) Tsai

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EDUCATION

University of Washington, Seattle, WA
Ph.D. Student in Electrical Engineering September 2014 – June 2019 (Expected)

National Taiwan University (NTU), Taipei, Taiwan
Bachelor of Science in Electrical Engineering September 2010 – June 2014

- Overall GPA: 3.85/4.0; Major GPA: 3.88/4.0
- Selected courses: The Design and Analysis of Algorithms* (A+), Advanced Statistics (I)* (A+), Advanced Statistics (II)* (A+), Data Structure and Programming (A+), Introduction to Computer Networks (A), Mobile Phone Programming* (A+), Advanced Digital Signal Processing* (A+), Engineering Mathematics – Linear Algebra (A+), Engineering Mathematics – Complex Variable (A+) (*): Graduate-level courses

RESEARCH INTERESTS

Machine Learning and Data Mining on Synthetic Biology Data

PUBLICATIONS

[1] Ning Lin, **Ping-Chia Tsai**, and Homer H. Chen, "Music Recommendation Based on Artist Novelty and Similarity," *2014 IEEE International Workshop on Multimedia Signal Processing* (*MMSP*). (*pdf*)

HONORS & AWARDS

Judges' Award, Undergraduate Special Project Contest, EE in National Taiwan University May 2014

- One of the ten teams selected to the final round for poster and oral presentation of undergraduate research

Mayor's Award, Kaohsiung First Girls' High School, Kaohsiung, Taiwan June 2010

- Awarded by Kaohsiung City Government to No. 1 students graduated from each high school

RESEARCH EXPERIENCE

Klavins Lab, University of Washington September 2014 – present
Advisor: Professor Eric Klavins, University of Washington

Petri Net GUI Development for Aquarium

- Build GUI for Aquarium, a software for helping reproduce experimental results in synthetic biology by representing wetlab protocols as computer language and keeping track on the processes
- Improve the programmable wetlab and make it more friendly to user

Machine Learning on Synthetic Biology Data

- Use machine learning techniques to learn and interpret DNA message from synthetic biology data

Multimedia Processing and Communications (MPAC) Lab, NTU August 2012 – July 2014
Advisor: Professor Homer H. Chen, Dept. of Electrical Engineering, NTU

Music Recommendation Based on Artist Novelty and Similarity [1]

- Developed a novelty-based music recommendation system which provides novel and fond music to users

- Considered not only users' taste but also artists' popularity to help promote new talent in music society
- The proposed system was evaluated by 106 subjects recruited from campus
- The system achieve high novelty performance and similar preference performance compared to the popular Spotify Radio

Image and Vision Lab, NTU September 2013 – June 2014

Advisor: Professor Yi-Ping Hung, Dept. of Computer Science and Information Engineering, NTU

Gaze Tracking on Smile Wall

- Developed methods to further improve the precision of gaze tracking by 30-40% (over the current 10%)
- Smile wall interacts with user and transmits the concept of happiness to users through gaze tracking
- Applied gaze tracking technique to interactive multimedia, education, and business

SELECTED PROJECTS

Music Classification Based on Mood Spring 2014

- Advisor: Professor Jian-Jiun Ding
- Implemented frequently used data mining and machine learning algorithms on music features data to categorize music into different mood
- Compared the performance of different algorithms applied on music mood classification

Mind Map Fall 2013

- Advisor: Professor Mike Y. Chen
- An iOS app (to serve as a product prototype) by which participants can record and organize their thoughts or flow of minds during brainstorming
- Has a drawing function that is distinct from general mind map
- Learned the basic knowledge on human-computer interaction and how to create a mobile phone app

Simulation of Low-Density Parity-Check (LDPC) Code Spring 2013

- Advisor: Professor Ping-Cheng Yeh
- Simulated the LDPC code used in 802.11n by encoding incoming signals by multiplication with a large-scale sparse matrix
- Results have shown that the code can reduce the error rate of the original BPSK code by almost 100%.

Functionally Reduced And-Inverter Graph (FRAIG) Fall 2012

- Advisor: Professor Chung-Yang Huang
- Wrote a C/C++ program to parse digital circuits described in the AIGER format
- Provided optimization functions to reduce the circuit size and simulation time by finding functionally equivalent candidate (FEC) pairs
- Learned how to model, optimize, and simulate digital circuits to verify their correctness in short time

WORK EXPERIENCE

Developer Intern, Cardinal Blue, Taipei, Taiwan September 2013 – June 2014

- Analyzed users' feedback of PicCollage, a photo app with over 50 million downloads
- Developed a new statistical algorithm to interpret the data of users' behavior
- Making suggestions to some specific functions to further improve users' preference to the app

EXTRACURRICULAR ACTIVITIES

Electrical Engineering Camp — July 2011, July 2012, July 2013

- Instructor and Activity Planner
- Designed 6-day activities for 100+ high school students attending the EE Camp; gave these high school students basic lectures on EE and led the 6-day activities

Orientation Camp of Department of Electrical Engineering — August 2011, August 2012

- Instructor and Fundraiser

  Led and Introduced EE freshmen to the new NTU study environment; solicited corporate sponsorship

Pop Dance Club — July 2012 – June 2013

- Dancer and Fundraiser

  Arranged the annual performance; solicited corporate sponsorship

SKILLS

- Programming Proficiencies: C/C++, Matlab, Python, Objective-C, Ruby on Rails
- Tools: Github, Heroku, Last.fm API
- Languages: Mandarin Chinese (fluent), Taiwanese (fluent), German (beginner)

HOBBIES

- Piano: Started to play piano at age four and attended government sponsored music lessons in elementary school for professional training; won Honorable Mention in Kaohsiung City Music Competition in 2003 (*video*)
- French Horn: Started to play French horn at age nine and became leader of the French horn team in the Kaohsiung Municipal Yan-Cheng Elementary School Orchestra which won First Place in Kaohsiung City Music Competition in 2003 and 2004 (*video*); won many individual Awards on French Horn Solo, including Third Prize and First Prize in Taiwan Music Competition – Kaohsiung in 2002 and 2003, respectively, and First Prize in Kaohsiung City Music Competition in 2003 (*video*)
- Choir: Selected to join Century Youth-Children's Choir–one of the most famous youth choirs in Taiwan often invited to travel around the world to perform shows for particular events–from 2004 to 2008; performed at Kaohsiung City Annual Concert & Show in Kaohsiung Cultural Center each year and the Music Festival in Spain in 2008 (*video*); joins National Taiwan University EE Choir in the senior year and had a performance on NTUEE Night in December, 2013
- Street Dance: Started to dance in college and joined the pop dance club for professional training; was a dancer in orientation performance and annual performance (*video*); was a dancer in EE Night in March, 2011 – 2014 (*video*)