Ping-Chia (Amber) Tsai

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EDUCATION

University of Washington, Seattle WA

M.S./Ph.D. in Electrical Engineering   September 2014 – June 2019 (Expected)

- GPA: Overall 3.88/4.0
- Coursework: Microcomputer Systems, Systems Programming, Artificial Intelligence for Engineer, Advanced Topics in Control System, Probability and Random Processes, Introduction to Synthetic Biology, Lab Methods in Synthetic Biology

National Taiwan University (NTU), Taipei, Taiwan   September 2010 – June 2014

B.S. in Electrical Engineering

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

PUBLICATION

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

HONORS & AWARDS

Grace Hopper Celebration (GHC) Scholarship Grant   July 2015

- Support women in computing for attending the GHC conference. The acceptance rate is 26 percent.

Judges' Award, Undergraduate Special Topics 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

RESEARCH EXPERIENCE

Klavins Lab, University of Washington   March 2014 – present

Advisor: Professor Eric Klavins, University of Washington

Genetic Counter Design

- Build CRISPR-based bistable switch, which forms the building block in synthetic genetic circuits
- Design genetic counter, which exploits the bistable switches and CRISPR-based transcription factors to behave like digital counter

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 achieves high novelty performance and similar preference performance compared to the popular Spotify Radio

Image and Vision Lab   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

- 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

Software Tools Development for Aquarium, Klavins Lab September 2014 – present
- Build petri net GUI and scheduling function 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 use

Satellite Management and Control System (Microcomputer Systems) Summer 2015
- Developed an embedded system, of which the goal is to mine minerals from asteroids with the Stellaris EKI-LM3S8962 system; utilized UML diagrams to reflect the dynamic and static aspects of the system
- The system is designed to be based on a real-time operating system (FreeRTOS) and to be able to collect and process the data from sensors, displaying information, using some of the data to control the peripherals for mining operations, make bidirectional remote communication via a simple web server and network interface

Mind Map (Mobile Phone Programming) Fall 2013
- Advisor: Professor Mike Y. Chen
- An iOS app 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 (Communication Lab) 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 (Data Structure and Programming) 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

Research Assistant, Klavins Lab, University of Washington, Seattle WA March 2015 – present
- Design gene circuits, such as bistable switch and counter
- Develop software tools for improvement of programmable wetlab and lab automation

Teaching Assistant, University of Washington, Seattle WA January 2015 – June 2015
- EE 215, Fundamentals of Electrical Engineering, Spring 2015
- EE 543, Models of Robot Manipulation, Winter 2015

Developer Intern, Cardinal Blue, Taipei, Taiwan September 2013 – June 2014
- Analyzed users' behavior of PicCollage, a photo app with over 60 million downloads, and visualized the data
- Developed a new statistical algorithm to interpret the data of users' behavior

SKILLS

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

EXTRACURRICULAR ACTIVITIES

Society of Women Engineers   October 2014 – present
- Active member
- Join the general meetings every month and events related to women engineers in industry

Time to Invent Outreach   October 2014 – present
- Lead 4th or 5th grade girls in Northgate Elementary School through hands-on activities to encourage the girls' interest in science and engineering once a month
- Plan UW visit for the girls to see what women engineers do in the university

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