# Yi-Wei Chen

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## Research Interests

Automated Machine Learning, Neural Architecture Search, Bayesian Optimization, Distributed Systems, Hadoop, Parallel and Distributed Computing

## Education

**Texas A&M University** College Station, USA
Ph.D., Computer Science and Engineering (CSE) Aug. 2018 –

- GPA: 4.0/4.9
- Relevant Coursework: Artificial Intelligence, Neural Network

**National Taiwan University (NTU)** Taipei, Taiwan
Master of Science in Computer Science and Information Engineering (CSIE) Feb. 2014 – Sep. 2015

- GPA : 4.04/4.30
- Thesis: Virtual Hadoop: MapReduce over Docker Containers with an Auto-Scaling Mechanism for Heterogeneous Environments
- Relevant Coursework: Operating System, Advanced Operating System, Parallel and Distributed Programming, Computing Theory, Social Network Analysis and Graph Mining, Applied Algebra, Virtual Machines, Theory and Practice for Cyber-Physical Systems

**National Taiwan University (NTU)** Taipei, Taiwan
Bachelor of Science in Electrical Engineering (EE) Sep. 2008 – Jun. 2012

- GPA : 3.79/4.00 (84.25/100)
- Relevant Coursework: Linear Algebra, Probability and Statistics, Algorithm, Data Structure and Programming, Introduction to Multimedia Processing, Introduction to Biomedical Informatics, Introduction to Computer Networks, Digital System Design

## Publication

**Conference Paper**

**[1]** **Yi-Wei Chen**, Shih-Hao Hung, Chia-Heng Tu, Chih Wei Yeh, "Virtual Hadoop: MapReduce over Docker Containers with an Auto-Scaling Mechanism for Heterogeneous Environments", 2016 Research in Adaptive and Convergent Systems (RACS), Odense, Denmark, Oct. 2016

## Research Experiences

**Data Analytics at Texas A&M (DATA) Lab, Texas A&M University** Aug. 2018 -
Advisor: Dr. Xia Hu

**Automated Machine Learning**

- Wrote a survey paper related to Automated Machine Learning
- Investigated Bayesian optimization to select promising learning model and associate hyperparameters in an AutoML project.
- Organized duplicated functions distributed in 16 files and condense them to 13 files with clear and intelligible comments in an AutoML framework

**Performance, Applications, and Security Lab (PAS Lab), National Taiwan University** Sep. 2014 - Aug. 2015

Advisor: Prof. Shih-Hao Hung

**Hadoop MapReduce with an auto-scaling mechanism [1]**

- Built Hadoop in Docker Containers over heterogeneous computing environment containing CPU, discrete GPU, Heterogeneous System Architecture (HSA)
- Designed a performance model of MapReduce to estimation MapReduce execution time in heterogeneous distributed environments
- Designed a QoS scheduler with an auto-scaling mechanism which allocate heterogeneous computing resources for MapReduce Applications
- Improved the deviation between actual execution time and time requirement of MapReduce from 0.74 to 0.15 (less is better)

**Digital Circuit Laboratory, National Taiwan University** Feb. 2012 – Jun. 2012

Advisor: Prof. Shao-Yi Chien

**Artistic Camera on DE2-70**

- Implemented traffic light system, RSA-256 bit encoder/decoder, and digital recorder on DE2-70
- Simulated image effects algorithms in C++, including Kuwahara filter algorithm (oil-pencil style), dividing pixels by local maximum (pencil-sketch style), and stretching pixels in random direction (impressionist style)
- Created a real-time image processing system on DE2-70 with touch panel, camera, and VGA, which could display the processed images immediately after taking pictures

**Access IC Design Laboratory, National Taiwan University**

Advisor: Prof. An-Yeu (Andy) Wu

**High throughput Finite Impulse Response (FIR) filter design and analysis** Sep. 2010 – Jan. 2011

- Designed register-transfer level (RTL) programs in Verilog, including complex number multiplier, FIFO register bank, and up-down counter.
- Simulated FIR filter coefficient with Hamming Window and fixed-point method in MATLAB
- Implemented a folding and parallel FIR filter with Look-up tables on FPGA

**3-Dimension Network-on-chip (NoC)** Feb. 2011 – Jun. 2011

- Fulfilled Valiant's Randomized Routing algorithm, Matrix Arbiter, wormhole flow control in NoC simulator, Noxim.
- Compared arbiters and allocators in flow control mechanisms including Oblivious Arbiter, Round-Robin Arbiter and Matrix Arbiter, Separable Allocator, Lonely Output Allocator, Wave-front Allocator
- Applied Lonely Output Allocator to relieve the thermal issue of 3D NoC.

## Working Experience

**Texas A&M University** College Station, USA

Graduate Teaching Assistant

**Software Engineering** Jan. 2019 – Present

- Guided 6-hour labs of Ruby on Rails for 100 students every week

**Trend Micro Inc.**, Taipei, Taiwan

Software Engineer**,** Deep Discovery Inspector (DDI), Network Defense Department

**System Enhancement** Oct. 2017 – Present

- Reduced unnecessary malloc/free operations in XML-like file access module to improve writing with 544 times and reading with 1,500 times on 10,000 entries.
- Fixed the 10 CSRF vulnerability in PHP/CGI files, 1 buffer overflow and 1 command injection in C/Python files.
- Allowed users importing YARA rule files so that DDI can scan suspicious objects based on custom rules

**Microsoft Active Directory Integration** Apr. 2017 – Oct. 2017

- Interacted with Microsoft Active Directory (AD) via LDAPv3 protocol, including password authentication, searching AD users and groups, and querying parent groups of an AD user and total members of an AD group.
- Implemented new log-on mechanism, AD account management and dynamic permission designation for accounts.
- Resolved 10 must-have system impacts, such as non-ASCII characters support, increasing DB fields length, saving accounts' filters and reports, etc.

**Trend Micro Services and 3rd-party products Integration** Feb. 2016 – Mar. 2017

- Provided RESTful APIs to diagnose network connection between DDI and 7 Trend Micro services.
- Fulfilled secure connection with CheckPoint Firewalls via SSL certificate and CheckPoint SDK OPSEC.
- Integrated Palo Alto Panorama and virtual systems of Palo Alto Firewalls via PAN XAPI
- Allowed users to assign Proxy to Trend Micro sandbox in DDI

**Academia Sinica**, Taiwan Sep. 2013 – Jan. 2014

Research Assistant, High Throughput Genomics Core

Director: Dr. Mei-Yeh Lu

- Constructed the bio-sequence data center for Illumina HiSeq 2500, MiSeq and Roche 454.
- Designed the network topology for 38 Staff computers, 3 switches, 5 sequencers and 5 sequence analyzing servers.
- Developed data storing, backup and rescue strategy for DNA sequencing, up to 30TB among 2 NAS, 1 disk array server, and 1 tape server.

**Math, Physics, and Chemistry Tutor,** Taiwan Oct. 2009 – Jul. 2012

- Taught 1 junior high school student and 4 senior high school students.

## Honors & Awards

**Top 15 Teams,** 2016 Machine Learning Contest for Malware Detection**,** Trend Micro Jun. 2016

- Analyzed train data of 50,000 PE files labeled as malware or not, and PE profiles, including headers, sections, importing DLLs, strings, assembly, and hexdump.
- Extracted distinct malicious characteristics from PE profiles into 4120 features, such as pre-define function blacklist, file permission, virtual memory size, 3-gram assembly instruction and trained 1st model via Random forest.
- Trained 2nd model via CNN by converting hexdump and assembly instructions into 64x64 images as CNN input, and then average the probability of two models.
- Predicted test data of 30,000 PE files and got the AUC score of 0.9978206756 which ranked 14 among 39 team

## Skills

**Programming Languages**: Python, C, Shell Script, Java, C++, Verilog, Ruby

**Tools**: Github, Scikit-Learn, Octave, Perforce, Wiki, Latex, Hadoop, Docker, MATLAB

## Leadership Experiences

**President,** Yoga Club, Trend Micro Corp. Mar. 2017 – Present

- Utilized pysheet to manage 70 memberships of 6 yoga classes each quarter from Google Spreadsheet
- Coordinated Trend Micro Administration, Yoga teachers, and Employee Welfare Committee to hold two Yoga workshops for the whole company

- Managed the club finances including collecting membership dues, keeping financial records, and preparing financial reports

**Leader of Curriculum Division,** World Volunteer Society, Nation Taiwan University Sep. 2011 – Jun. 2012

- Planned and taught over 15 classes related volunteering affairs including skills, manners, and global issues like environment protect, starvation and resource distribution for 60-70 participants
- Supervised 2 activities and 4 lectures of the winner program for elementary students in Hualien and gave advices to the summer program for institute in India and Philippine.
- Cooperated with NGOs, such VYA, Vision Youth Active, Waker, Rotary Club.