"Aaron" YI-AN **LAI**

RESEARCH ASSISTANT · DATA SCIENTIST

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Objective

Lead a team to incorporate machine intelligence genes into the IT industry in Taiwan

Education

National Taiwan University (NTU) *Taipei, Taiwan*

B.S. IN PHYSICS *Sept. 2010 - June 2014*

GPA	Overall - 3.95 / 4.30 (3.84 / 4.00) ; Last 60 - 3.95 / 4.30 (3.85 / 4.00)
Overall ranking	11 / 67
Relevant Courses	Applied Mathematics (I) - (IV) (Linear Algebra, Vector Calculus, Numerical Methods), Programming Design
Audited Courses	Optimization and Machine Learning, Numerical Methods, Applied Deep Learning, Machine Discovery, Deep and Structured Machine Learning [**link**]
Coursera Courses	Machine Learning Foundations, Machine Learning Techniques [**link**], Mining Massive Datasets [**link**]

Research Interests

Knowledge Discovery and Data Mining , Big Data Analytics , Machine Learning , Deep Learning

Publications

CONFERENCE PAPER

[1] Chin-Chi Hsu, **Yi-An Lai**, Wen-Hao Chen, Ming-Han Feng, and Shou-De Lin, "Unsupervised Ranking using Graph Structures and Node Attributes," in *WSDM* 2017, ACM. [**PDF Link**]

Honors & Awards

ACADEMIC

2014 **Dean's List**, College of Science, National Taiwan University *Taipei, Taiwan*

- Awarded each year to the top 10% of graduates based on overall GPA

Research Experience

Machine Discovery and Social Network Mining Lab *Dept. of CSIE, National Taiwan University*

RESEARCH ASSISTANT (UNDER PROF. SHOU-DE LIN) *Sept. 2015 - present*

- Unsupervised Ranking using Graph Structures and Node Attributes
  - Proposed an unsupervised, domain-independent ranking framework **[1]** exploiting both link structures and node attributes to improve the quality of node importance ranking
  - Leveraged two approximation techniques based on eigenvectors and Taylor expansion to bring the time complexity of the algorithm linear to the number of nodes
  - Provided theoretical justifications for the selection of hyperparameters under the unsupervised learning framework
- Unsupervised Ranking via Link Prediction with Node Attributes
  - Propose a Matrix-Factorization-based link prediction model exploiting node attributes and ranking to enhance link structures
  - Leverage node attributes and enhanced link structures of the graph to improve node ranking
  - Combine previous two models for joint learning to boost the quality of node importance ranking
- Survey of Matrix Factorization Model with Ratings and Features for Recommender Systems
  - Review more than 60 key references to summarize and analyze various recommendation scenarios regarding feature-based Matrix Factorization model (Latent factor model)
  - Condense survey results and identify open issues and possible future research directions
- Paper Review
  - Assisted in reviewing papers for *AAAI, WWW*

Work Experience

GliaCloud Co., Ltd. (Startup) *Taipei, Taiwan*

Data Scientist *July 2016 - present*

- Develope the core infrastructure and functions of automated video creation, such as transition and animation, quality adjusting, and text effects, from self-invented YAML format of video scripts [website]
- Reduce the memory consumption of video creation by a factor of ten by adopting compressed sparse row matrix format
- Speed up the video creation about eight times faster by parallelizing it over an asynchronous, distributed task queue

GliaCloud Co., Ltd. *Taipei, Taiwan*

Intern Software Engineer *Jan. 2016 - June 2016*

- Developed web scrapers based on HTML parser and regular expression matching to automatically extract and parse all the news articles and user comments of ten largest news websites for social opinion mining
- Built a predictive model based on Factorization Machine to recommend superior parameter settings for digital advertising
- Performed data cleansing on raw open data from governments across the globe and offered a unified interface to access data

Armor Brigade, Republic of China Army *Hsinchu, Taiwan*

Security Officer (Compulsory Military Service) *Aug. 2014 - July 2015*

- Organized education events in political warfare, rotated as duty officer of the day, and assisted the Chief Counselor in special projects

International City Wanderer Education Association *Taipei, Taiwan*

Cofounder / Technical Engineer *Mar. 2013 - Aug. 2014*

- Initiated City Wanderer competition for students to strengthen connections with families, friends, and community
- Built the official website for users to upload and edit texts and images of completed missions and showcase the results

Teaching Experience

Machine Learning *Graduate Institute of Electrical Engineering, NTU*

Teaching Assistant (Prof. Hung-Yi Lee) *Sept. 2016 - Jan. 2017*

- Designed four homework assignments regarding regression, classification, and clustering and host a competition as the final project.
- Reviewed reports and codes of 250 students and offered TA sessions together with other teaching assistants. [syllabus]

Game Theory with Applications to Marketing and Finance *Dept. of Finance, NTU*

Teaching Assistant (Prof. Chyi-Mei Chen) *Sept. 2013 - Jan. 2014*

- Organized weekly 2-hour TA sessions to demonstrate how to model marketing or financial problems in repeated games, signaling games, or screening games and find the equilibrium. [syllabus]

Skills

Programming Languages	Python (Theano, TensorFlow, Pandas, scikit-learn), MATLAB, C / C++, Java, HTML / CSS, LaTeX
	Mandarin Chinese (Native), English (Fluent), Taiwanese (Intermediate)

Presentations

Google Developer Group - DevFest Taipei 2016 *Taipei, Taiwan*

Invited Speaker *Dec. 2016*

- Activity Recognition with TensorFlow - Introduce how to leverage a power tool, TensorFlow, to realize deep learning models and recognize the activities present in the video [**link**]

Taipei Python User Group *Taipei, Taiwan*

Invited Speaker *Aug. 2016*

- Introduced a Python module to edit and compose videos or create special effects by scripts, which could play as the backend to empower the automatic AI video editing [**link**]

Selected Projects

Visual Question Answering	Constructed a deep neural network to answer multiple-choice questions about images [**link**]
Reinforcement Learning	Trained two reinforcement learning agents (Deep Q-Network) to play Gomoku (Five-in-a-Row) against each other [**link**]
Probabilistic Graphical Model	Build a bayesian network trained by the expectation–maximization(EM) algorithm or Markov Chain Monte Carlo(MCMC) methods to decipher ancient languages (Ongoing) [**link**]