Yen-Yu Chang

10F., No.211, Sec. 1, Jiafeng 5th Rd., Zhubei City, Hsinchu County 302, Taiwan (R.O.C.)

📱 (+886) 910-983293 | ✉ yenyuchang0322@gmail.com | 🏠 yuyuchang.github.io | Ⓢ rubb9diaw

Research Interests

Machine Learning
Deep learning, reinforcement learning, multi-agent system, and time series forecasting
Spoken Language Processing
Natural language and speech processing, speech enhancement, and reinforcement learning with natural language guidance

Education

National Taiwan University (NTU)   *Sep. 2014 - Jun. 2018*
BACHELOR OF SCIENCE IN ENGINEERING   *Taipei, Taiwan*
- Major: Electrical Engineering
- Cumulative GPA: 4.02/4.30, Major GPA: 4.04/4.30, CS-Related GPA: 4.13/4.30

Publications

ANS: Adaptive Network Scaling for Deep Rectifier Reinforcement Learning Models | Link   *Sep. 2019*
Yueh-Hua Wu, Fan-Yun Sun, Yen-Yu Chang, and Shou-De Lin
SUBMITTED TO 2019 THE EUROPEAN CONFERENCE ON MACHINE LEARNING AND PRINCIPLES AND PRACTICE OF KNOWLEDGE   *Würzburg, Germany*
DISCOVERY IN DATABASES (ECMLPKDD2019)
- Provided a thorough study on how reward scaling can affect performance of deep reinforcement learning agents.
- Proposed an Adaptive Network Scaling framework to find a suitable scale of the rewards during learning for better performance.

A Memory-Network Based for Multivariate Time-Series Forecasting | Link   *Aug. 2019*
Yen-Yu Chang, Fan-Yun Sun, Yueh-Hua Wu, and Shou-De Lin
SUBMITTED TO 2019 INTERNATIONAL JOINT CONFERENCE ON ARTIFICIAL INTELLIGENCE (IJCAI-19)   *Macao, China*
- Proposed a memory time-series network (MTNet) to address the multivariate time series forecasting.
- Visualized and analyzed the attention mechanism of the long-term time series data.
- Outperform state-of-the-art models in both univariate and multivariate time series forecasting.

Noise-to-Noise Speech Enhancement: Speech Denoising without Clean Speech | Link   *May. 2019*
Yen-Yu Chang, Jing-Cheng Chang, and Hung-Yi Lee
SUBMITTED TO 2019 IEEE INTERNATIONAL CONFERENCE ON ACOUSTICS, SPEECH, AND SIGNAL PROCESSING (ICASSP 2019)   *Brighton, UK*
- Proposed a Noise-to-Noise method in speech denoising without clean speech data.
- The results is comparable to the typical supervised based speech denoising methods.
- To our best knowledge, this is the first paper investigating Noise-to-Noise speech enhancement.

A Regulation Enforcement Solution for Multi-agent Reinforcement Learning   *May. 2019*
Fan-Yun Sun, Yen-Yu Chang, Yueh-Hua Wu, and Shou-De Lin
SUBMITTED TO 2019 INTERNATIONAL CONFERENCE ON AUTONOMOUS AGENTS AND MULTIAGENT SYSTEMS (AAMAS-19)   *Montreal, Canada*
- Proposed the task of Regulation Enforcement and provided its connection to a well known problem (social dilemma).
- Designed a mechanism that discourages the agents from not obeying the global regulation given a decentralized environment.

Designing Non-greedy Reinforcement Learning Agents with Diminishing Reward Shaping | Link   *Feb. 2018*
Fan-Yun Sun, Yen-Yu Chang, Yueh-Hua Wu, and Shou-De Lin
PUBLISHED IN 2018 AAAI/ACM CONFERENCE ON ARTIFICIAL INTELLIGENCE, ETHICS, AND SOCIETY (AIES-18)   *New Orleans, USA*
- Proposed a diminishing reward shaping to avoid greedy behaviors of agents.

Heterogeneous Star Celebrity Games | Link
Yen-Yu Chang, Chin-Chia Hsu, and Ho-Lin Chen
PREPRINT
- Proved the Price of Anarchy (i.e., PoA) is upper bounded by $O(\frac{n}{\beta})$ for all Heterogeneous Star Celebrity Games.

Research Experiences

Undergraduate Researcher, instructed by Prof. Hung-Yi Lee & Prof. Lin-Shan Lee   *Feb. 2017 - Jun. 2018*
SPEECH PROCESSING AND MACHINE LEARNING LABORATORY, DEPARTMENT OF ELECTRICAL ENGINEERING, NTU   *Taipei, Taiwan*
- Researched on speech signal processing, with focus on speech enhancement and submitted the paper **"Noise-to-Noise Speech Enhancement: Speech Denoising without Clean Speech"** to **ICASSP-2019**.
- Researched on natural language processing, with focus on question answering.
- Researched on reinforcement learning with demonstrations and natural language guidance.

Undergraduate Researcher, instructed by Prof. Shou-de Lin
Jul. 2016 - Jun. 2018

MACHINE DISCOVERY AND SOCIAL NETWORK MINING LABORATORY, DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING, NTU
Taipei, Taiwan

- Researched on reinforcement learning and multi-agent system, with focus on collaborative and ethics behaviors and published the paper **"Designing Non-greedy Reinforcement Learning Agents with Diminishing Reward Shaping"** to **AIES-19**.
- Researched on time series forecasting, with focus on long-term multivariate prediction and submitted the paper **"A Memory-Network Based Solution for Multivariate Time-Series Forecasint"** to **IJCAI-19**.
- Researched on reinforcement learning, with focus on reward scaling and submitted the paper **"ANS: Adaptive Network Scaling for Deep Rectifier Reinforcement Learning Models"** to **ECML PKDD 2019**.
- Researched on reinforcement learning and multi-agent system, with focus on learning agent-to-agent interaction and submitted the paper **"A Regulation Enforcement Solution for Multi-agent Reinforcement Learning"** to **AAMAS 2019**.
- Participated in **KDD Cup 2018** and achieved **19th place** in main prize and **4th place** in special prize.

Undergraduate Researcher, instructed by Prof. Ho-Lin Chen
Jul. 2015 - Jul. 2017

GAME THEORY AND MOLECULAR COMPUTING LABORATORY, DEPARTMENT OF ELECTRICAL ENGINEERING, NTU
Taipei, Taiwan

- Researched on game theory, with focus on network creation games and price of anarchy (PoA).
- Proved the PoA is upper bounded by $O(\frac{n}{\beta})$ for all Heterogeneous Star Celebrity Games.

Honors & Awards

INTERNATIONAL

2018	**19th Place (out of 662 teams)**, KDD Cup 2018	*London, U.K.*
2018	**4th Place (out of 662 teams)**, KDD Cup 2018 Special Prize	*London, U.K.*

DOMESTIC

2016	**Dean's List**, GPA in top 5% in Department of Electical Engineering, NTU	*Taipei, Taiwan*

Selected Projects

Cyber Security Attack Defender
Sep. 2016 - Jan. 2017

FOR EE5177 (MACHINE LEARNING)

- Predict cyber attack based on real world dataset about connection information
- Won **4th prize** in EE5177 final project competition.

Long-term Air Quality Forecasting
Mar. 2018 - Jun. 2018

FOR CSIE7433 (MACHINE LEARNING: THEORY AND PRACTICE)

- Built a recurrent neural network model to forecast air quality in future 48 hours and applied forecast weather data in our RNN.
- **19th place** in KDD Cup 2018 and **4th place** in KDD Cup 2018 special prize

Relevant Courses

ML/AI	Machine Learning*, Machine Learning: Theory and Practice*, Applied Deep Learning*
Computer Science	Data Structures & Algorithms, Algorithm Design & Analysis, The Design & Analysis of Algorithms*, Systems Programming, Operating Systems, Computer Networks
Mathematics	Linear Algebra, Probability & Statistics, Calculus, Differential Equations, Discrete Mathematics
Signal Processing	Signal & System, Digital Speech Processing, Advanced Digital Signal Processing*

* denotes graduate-level courses

Skills

Languages	Python, C/C++, Shell scripting, Matlab
Libraries/Tools	Keras, Tensorflow, Pytorch
OS	GNU/Linux (Ubuntu & Arch Linux), Mac OSX
Other	Git, LaTeX

Leadership and Team Work

National Taiwan University Hsinchu Alumni Association
Jul. 2015 - Jun. 2016

PRESIDENT
Taipei, Taiwan

- Developed a comprehensive database of all alumni, assisted with the planning and organization of reunions.
- Supported a strong relationship between the Alumni Association and current students;
- Organized remote volunteering activities in Hsinchu.

National Taiwan University Table Tennis School Team
Sep. 2014 - Mar. 2015

MEMBER
Taipei, Taiwan

- Participated in several national competitions.