Yi-Lin Tuan

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Research Interests

I'm particularly interested in **natural language and speech processing**, and a wide range of machine learning, deep learning, reinforcement learning and knowledge inference.

Education

- **National Taiwan University (NTU), Taipei, Taiwan** *Sep. 2013 - June. 2017*
  B.S. in Electrical Engineering, College of Electrical Engineering and Computer Science
  Overall GPA: 4.13/4.30; Relavent coursework: 4.18/4.30

Publications

[1] **Yi-Lin Tuan** and Hung-yi Lee. *Improving Conditional Sequence Generative Adversarial Network by Stepwise Evaluation*. arXiv preprint arXiv:1808.05599.

[2] **Yi-Lin Tuan***, Jinzhi Zhang*, Yujia Li, and Hung-yi Lee. *Proximal Policy Optimization and its Dynamic Version for Sequence Generation*. arXiv preprint arXiv:1808.07982.

[3] Che-Ping Tsai*, **Yi-Lin Tuan***, and Lin-shan Lee. *Transcribing Lyrics from Commercial Song Audio: the First Step towards Singing Content Processing*. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2018.

[4] Zih-Yun Chiu, **Yi-Lin Tuan**, Hung-yi Lee, and Li-Chen Fu. *Parallelized Reverse Curriculum Generation*. submitted to The Association for the Advancement of Artificial Intelligence (AAAI) , 2019.

* indicates co-first authors

Research Experience

- **Speech Processing and Machine Learning Laboratory, NTU** *Aug. 2015 - Present*
  Research Assistant (RA) and **Undergraduate Researcher**
  Advisors: Prof. Hung-yi Lee and Prof. Lin-shan Lee
  - **Generative Adversarial Network (GAN).** My researches did generative adversarial network for **text generation**, especially focused on conditional text generation such as dialogue. (1) One research proposed novel idea to optimize GAN in an efficient way for higher training stability and lower computational costs. (2) Another research transferred the update method for sequence generation from policy gradient to proximal policy optimization (PPO) to stabilize the training, and proposed a dynamic version of PPO to facilitate the training.
  - **Speech Processing.** A research studied the adaptation of speech recognition to singing audio, in which I did the ablation study and alleviated the recognition errors caused by characteristics of singing, such as varying pitch and prolonged phoneme duration.
  - **Dialog Generation with Knowledge Graph.** The research incorporated knowledge graph into dialog generation,especially focused on when the knowledge graph was incomplete and would change over time. The key problem to be solved was if knowledge can be learned through learning dialogs.

- **Second Reviewer**
  - Natural language processing conference and journals: ACL 2018, EMNLP 2018, CSL

Teaching Experience

- **CommE 5045,** *Feb. 2017 - July. 2017*
  Machine Learning and Having it Deep and Structured
  Instructor: Prof. Hung-yi Lee
  Tutored in GAN, deep reinforcement learning and chit-chat chatbot.

- **EE4049, Special Project** *Oct. 2017 - present.*
  Instructor: Prof. Lin-shan Lee and Prof. Hung-yi Lee
  Led, advised and participated in the researches of 5 undergraduate students. The group is currently working on the following two projects.
  - **Chatbot towards Personalized Speaker and Addressee by StarGAN.**
  - **What does a GAN learn? An Analysis of Discriminator of Conversational Model.**

Awards & Honors

- **Presidential Award (top 5%; rank 1/169)** *Mar. 2014*
- **NTU Electrical Engineering 1960 Alumni Scholarship (US$3,000)** *Sep. 2014, Sep. 2016*

Term Projects

- **Piano Accompaniment Robot** [video] *Oct. 2016 - Feb. 2017*
  CSIE 5047, Robotics
  Designed the planing algorithm and the robotics mechanism to build a robot that can automatically accompanies a heard audio on the piano.
- **Language Sentiment Classification** *Oct. 2015 - Aug. 2016*
  EE 4037, Introduction to Digital Speech Processing
  Improved the classification of positive-negative sentiment of text by deep learning and external POS tagging.

Extracurricular Activities

- **Melody & Lyrics Club, National Taiwan University** *Sep. 2013 - June. 2015*
  - **Director and Playwright of Musical**: Wrote the script and music, and directed the performance.

Relevant Coursework

- **Machine Learning / Artificial Intelligence**
  Deep and Structured Learning†, Data Analytics and Modeling†, Robotics†, Music Signal Analysis and Retrieval†, Digital Speech Processing†.

- **Fundamental Programming and Mathematics Courses**
  Algorithms, Data Structure and Programming, Computer Programming, Introduction to Computer, Computer Architecture, Probability and Statistics, Linear Algebra, Calculus.

† indicates graduate-level course

Skills

- **Languages**: Chinese(Native), English(Advanced)
- **Programming Languages**: Python, C/C++/C#, Shell Script, Matlab, System Verilog
- **Tools**: Tensorflow, Pytorch, Theano, Kaldi, Praat, Git, LaTeX