Boyo Chen

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RESEARCH INTEREST

Spiking Neural Networks   Neural Science   Computer Vision

Remote Sensing Images   Generative Models

EDUCATION

National Taiwan University, Taipei, Taiwan

B.S. of Computer Science and Information Engineering	September 2012 - July 2016
M.S. of Computer Science and Information Engineering	September 2016 - July 2018

The University of Tokyo, Tokyo, Japan

Ph.D. of Complexity Science and Engineering	April 2021 - current

SKILLS

- Proficient

    - Python programming.

    - Machine learning algorithms and applications.

    - Data-intensive applications.

- Intermediate

    - C/C++ programming.

    - Document-oriented databases, such as MongoDB.

    - Build and maintain Restful API and GraphQL API.

    - Distributed computing with Apache Spark.

- With Primary Knowledge

    - CICD: Jenkins, Docker, Kubernetes.

    - Relation-oriented databases such as PostgreSQL and MySQL.

    - Object-oriented programming using Java, Android.

WORKING EXPERIENCE

Yahoo, Taipei, Taiwan   July 2017 - August 2017

Software Engineer Intern.

- Delivered a successful framework enhancing searching user experience within two months in Yahoo Global Search Team.

- Implement cluster-computing machine learning algorithms using Apache Spark.

Appier, Taipei, Taiwan   January 2019 - November 2019

Backend Engineer.

- Maintain legacy systems.

- Build and optimize a data-intensive API server with graphQL.

National Taiwan University, Taipei, Taiwan   December 2019 - March 2021

Research assistant.

- Co-work with Central Weather Bureau to improve operational forecasting procedure in tropical cyclone intensity estimation.

- Extend my master thesis to be complete as a system, covering more aspects of tropical cyclone forecasting.

PUBLICATION

Rotation-Blended CNNs on a New Open Dataset for Tropical Cyclone Image-to-intensity Regression
Boyo Chen, Buo-Fu Chen, Hsuan-Tien Lin *KDD 2018*

- Carefully demonstrated several critical properties of TC intensity estimation task.
- Adapted classical CNN structure to propose an innovative model with promising performance.
- Organized a new dataset of TC images for other fellow researchers.

Estimating Tropical Cyclone Intensity by Satellite Imagery Utilizing Convolutional Neural Networks
Buo-Fu Chen, **Boyo Chen**, Hsuan-Tien Lin, Russell L. Elsberry
Weather and Forecasting April 2019, Vol. 34, No. 2

- Refine the conclusion from the previous work and publish the improvement to Atmospheric scientists.

Real-time Tropical Cyclone Intensity Estimation by Handling Temporally Heterogeneous Satellite Data
Boyo Chen, Buo-Fu Chen, Yun-Nung Chen *AAAI 2021*

- Use **Generative Adversarial Network** to handle missing data.
- Repair damaged visible light channel images collected during the night.
- Improve the estimating frequency of TC intensity from **1 per 3hr** to **1 per 15min**.

CNN Profiler on Polar Coordinate Images for Tropical Cyclone Structure Analysis
Boyo Chen, Buo-Fu Chen, Chun-Min Hsiao *AAAI 2021*

- Developed a specialized convolutional model on polar coordinates, according to a TC's rotational and spiral natures.
- Analyze the TC structure profile, consider not only intensity but also size of a TC, which is a barely developed yet important topic.
- Organized a new dataset of TC images for other fellow researchers.

Accurate and Clear Precipitation Nowcasting with Consecutive Attention and Rain-map Discrimination
Ashesh, Buo-Fu Chen, Treng-Shi Huang, **Boyo Chen**, Chia-Tung Chang, Hsuan-Tien Lin *AIES 2022*

- Proposed a Recurrent Convolution Networks (ConvLSTM) model that solves quantitative precipitation nowcasting tasks.
- Use a discriminator to enhance the reliability of the prediction.

RESEARCH EXPERIENCE

3D printing project of Ministry of Science and Technology
February 2015 - June 2015
Work as a project member in a three-person sub-team.
- Was responsible for sketch-based 3D model retrieval.
- Designed a Siamese convolution neural network framework base on sketch features and 3D object features.

National Taiwan University, Taipei, Taiwan
June 2016 - July 2018
Research assistant of Professor Hsuan-Tien Lin in the *Computational Learning Lab*
- Devote to improving recent deep learning structures and learning their theoretical foundations.

2015 IEEE Signal Processing Cup - Team MiRAHEALTH
October 2014 - January 2015
Knowledge Discovery and Data Mining Cup 2017
March 2017 - June 2017
Knowledge Discovery and Data Mining Cup 2018
March 2018 - June 2018

OTHER EXPERIENCE

National Taiwan University, Taipei, Taiwan

Teaching assistant of Professor Hsuan-Tien Lin

- Machine Learning Foundations, 2016 fall   About 100 students.
- Machine Learning Techniques, 2017 spring   About 130 students.
- Machine Learning Foundations, 2017 fall   About 260 students.
- Machine Learning Techniques, 2018 spring   About 200 students.