Zhiwei Zhou

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Master's Course (Graduates Aug 2023) at
Laboratory of Agro-Environmental Studies, GSFS, UTokyo

Experience

Oct 2022 ~

Detection algorithms for IoT systems

Joint development with TEPSCO and Kinoshita Ringo Farm

Main contributions in computer vision applications for agriculture IoT:

- Updating the algorithms with architectural modifications for the fruit detection system, improves efficiency.
- Automating data cleaning and image augmentation for captured training images.
- Experimentation for sensitive blossom detection.

Project

Tracking and predicting tropical cyclone/typhoon locations with atmospheric reanalysis data (ERA5)

Combining CNN and LSTM to accommodate both spatial and temporal relationships of atmospheric images.

To improve performance, the model adopts a moving frame to make sure the eyes of cyclones are always in the center of a relatively small image. The model is capable of predicting typhoon location in the next 3 hours in real-time (within 1 second) and produces errors within 0.5° on average. See example HERE.

Project

Guided water environment forecasting with SWAT and LSTM

Time-series forecasting of water quality under meteorological inputs. To put the complexity of hydrological systems into account, the model was "guided" by physic-based model SWAT (Soil and Water Assessment Tools), the outputs of which were used to train the model.
See example on Lake Kasumigaura (Kitaura) HERE.

Miscellaneous

Implementation of DenseNet

My implementation of the paper Densely Connected Convolutional Networks that allows more control over the architecture of each layer.

Web scraping/Data cleaning tools for research

With Requests and Beautiful Soup.

Skills

Languages

- Python | Java | SQL | Shell | R

Libraries

- PyTorch | Pandas | NumPy | scikit-learn | OpenCV

Development

- Git | Docker | PySpark

Education

M.A. (expected)
Department of International Studies,
Graduate School of Frontier Science,
University of Tokyo.

B.S.
School of Chemical Engineering,
Dalian University of Technology,
PRC.

Language

English

-fluent/native level

Japanese
-conversational (improving)

Mandarin
-native