SIYUAN SHI

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EDUCATION

New York University, *Brooklyn, NY* Sept 2019 – May 2021
Program: Master's in Computer Engineering, Current GPA: 3.85/4.00

Nanjing University of Aeronautics and Astronautics, *Nanjing, Jiangsu, China* Sept 2015 – Jun 2019
Bachelor of Science, Information Engineering, GPA: 3.5/5.00

University of Wisconsin-Madison, *Madison, WI* Sept 2017 – Dec 2017
Exchange Program, GPA: 3.75/4.00

SKILLS

- Programming Language: C/C++, Python, HTML, MySQL, JavaScript
- Software and Framework: PyTorch, Keras, TensorFlow, Django, MATLAB, Mathematica, Linux, Ryu, Hadoop

WORKING EXPERIENCE

NYU Multimedia and Visual Computing Lab, *Brooklyn, New York* June 2020 - July 2020
Research Assistant

- Designed a model for hyperspectral remote sensing which classifies every pixel of satellite image into a certain land-cover type including crop, buildings, and natural perennial vegetation.
- Implemented spectral attention and spatial attention on the model to efficiently extract features in hyperspectral image, and passed the concatenated spectral-spatial features into a softmax classifier to get final results.
- Achieved 95% accuracy with 10% samples used for training on Indian Pines, Pavia University and other two datasets.
- Designed a Few-Shot Object Detection model which requires fewer training data to achieve satisfied result on object detection which is helpful in scenarios such as medical images where sufficient training data is hard to get.
- Applied attention-RPN and Cross-Reference on the model to extract accurate feature from support images. Passed the feature to ROI-Pooling, bounding boxes regressor and categories classifier to get average precision.
- Evaluated the model on MS COCO dataset and achieved 65.0% on AP_{50} and 42.9% on AP_{75}.

ACADEMIC PROJECTS

CSAW HackML 2020 Backdoor detection, *Brooklyn, New York* Oct 2020 - Dec 2020

- Designed a model to detect and repair backdoors in deep learning model using Keras framework, which is useful in applications such as self-driving cars or face verification system where security is key indicator.
- Implemented backdoor detection using STRong Intentional Perturbation (STRIP) based on the idea that triggers have strong effect to force a fixed wrong prediction.
- Repaired the models using fine-pruning, the principle of which is removing neurons that are dormant for clean inputs so that these neurons will not be activated by backdoor triggers.
- Achieved 93% true negative rate and 97% true positive rate on backdoor detection and 99% accuracy on repaired model.

Embedded Challenge Term Project "Embedded Sentry", *Brooklyn, New York* Apr 2020 - June 2020

- Used microcontroller and Inertial Measurement Unit to design a system in C++ that can record and recognize hands movements, which could be further used in smart locks system as extra verification method.
- Sampled sequence of data including acceleration and angular motion using accelerometer and transferred data to the microcontroller via Inter-Integrated Circuit (I2C) Protocol.
- Used Kalman filter to smooth the time sequence and Dynamic Time Warping (DTW) algorithm to match patterns, achieving about 70% accuracy on complicate movements detection.

Database System Design and Web-based User Interface, *Brooklyn, New York* Mar 2020 - May 2020

- Designed for an insurance company a database system which consists of home insurance and auto insurance and web-based user interface where users can register, login, purchase and query insurances.
- Created logical model and relational model using Oracle datamodeler. Implemented the database system using MySQL.
- Designed a web-based user interface with features including user login system, insurance query system and admin authorization system using Django framework, coded in Python, HTML and CSS.
- Improved security by using csrf token to prevent Cross-Site Request Forgery and adding more constraints such as date constraint using jQuery.