Yuhao Cheng

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Education Background

➢ Beijing University of Posts and Telecommunications   Beijing, China
- **Degree:** MSc. in Computer Technology   2018.09-2021.07

➢ Beijing University of Posts and Telecommunications   Beijing, China
- **Degree:** B.Eng in Internet of Things Engineering   2014.09-2018.07
- **Double Degree:** B.Sc (Engnieering) with *Honors First Class* in Internet of Things Engineering issued by Queen Mary University of London
- GPA: **3.70/4.0** ｜ Ranking: **Top 10%**

➢ Coursework Research List, referring to Appendix 1

Academic Publications

➢ **PyAnomaly: A Pytorch-based Toolkit for Video Anomaly Detection**   **2020**
- Issued in *ACM MM 2020* as the **First Author** of the paper, **CCF A-Level**
- Reproduced representative methods in three different categories, supplemented some training tricks and evaluated them on three typical benchmarks, and implemented by using hooks and registers functionality
- Referred to the website: *https://github.com/YuhaoCheng/PyAnomaly*

➢ **Pose-Guided Tracking-by-Detection: Robust Multi-Person Pose Tracking**   **2019**
- Issued in *IEEE Transaction on Multimedia* as the **Third Author** of the paper, **CCF B-Level**
- Solved the problems of the general track-by-detection strategy that ignores the consistent pose information during the whole framework, thus, often suffering from missing detections or inaccurate human association in challenging scenes with motion blur or person occlusion
- Referred to the website: *https://github.com/JDAI-CV/PGPT*

➢ **POINet: Pose-Guided Ovonic Insight Network for Multi-Person Pose Tracking**   **2019**
- Issued in *ACM MM 2019*, **CCF A-Level**
- Proposed an end-to-end pose-guided ovonic insight network (POINet) for the data association in multi-person pose tracking and to adaptively encode the cross-frame identity transformation, finally provided a new insight to realize multi-person pose tracking in an end-to-end fashion

➢ **Paten for Invention: The Method and Devices Applied to Generating Gait Recognition Module**   **2018**
- Patent Number: ZL201811463430.1 (Served as the **third inventor**)
- Based on the training sample set and presetting loss functions, invented a gait recognition model to improve the accuracy of gait recognition and a system to collect the gait data.

Academic Research (In Progress)

➢ **Project Title:** Algorithm research and implementation of abnormal events detection in intelligent surveillance system
- **Objectives:** Aim to implement a system of video anomaly detection using self-supervised methods
- **Methodology:** video understanding, self-supervised learning

Academic Projects

- ➢ **Open Source Projects**
  - ● **PyAnomaly**   **2019.11 - 2020.05**
    - ✓ Project Page: *https://github.com/YuhaoCheng/PyAnomaly*
    - ✓ **Introduction:** PyAnomaly is used for the task of detecting the anomaly events in videos. That task aims to locate and distinguish the abnormal events in test data, only training with normal data (and a few abnormal data). This task has a wide application in Smart City, Automatic Drive, and Video Understanding; however, we don't have an open-source project containing the SOTA methods. **PyAnomaly is the first one**. Meanwhile, PyAnomaly can be easily extended by researchers and engineers because it bases the characteristics of anomaly detection to standardize the project's structure, build the abstract classes, define the pipeline of processing data, and has the detailed documents. **I contribute all of the codes of this project.**

  - ● **PoseTrack**   **2018.10 - 2019.04**
    - ✓ Project Page: *https://github.com/JDAI-CV/PGPT*
    - ✓ **Introduction:** PGPT is an open-source project of Pose-Guided Tracking-by-Detection: Robust Multi-Person Pose Tracking. PGPT wishes to solve the problem of tracking the human pose in videos, which faces many challenges. These include how to track the human in a long time accurately, and how to match the TrackingID with the human pose accurately. PGPT solves these challenges to some extent, and our result of PoseTrack competition keeps the **1st Place** on the Leader Board in 2018-2019. **The code is contributed by the other student in the lab and me.**

- ➢ **The Bachelor-Degree Graduation Paper**
  - ● **An IoT System for Smart Building Monitoring**   **2017.08 - 2018.06**
    - ✓ Designed and implemented a building monitoring system which includes clouding computing, data analytics and web designing
    - ✓ Used the LoPy to create the network for devices and made a Web application to help users to retrieve and analyze the data, and manage the devices, referring to: *https://github.com/YuhaoCheng/IoT-Project*
    - ✓ Awarded **the Best Bachelor's Degree Graduation Paper Award**

- ➢ **Mathematics Modeling**
  - ● **Interdisciplinary Contest in Modeling**   **2015.12 - 2016.01**
    - ✓ Served as the team leader to organize the whole team to evaluate and predict the ability of the north Central United States to provide clean water for its people
    - ✓ Established the measurement model and forecasting model and then built dynamic analysis model to propose an intervention plan, finally giving the results of analysis
    - ✓ Wrote a paper: *Methods of Measuring, Assessing and Predicting the Availability of Clean Water Models*
    - ✓ Awarded the **Meritorious Winner**

  - ● **Academic Paper: <u>Assessment on The Equity of *Hearthstone* Using Modeling</u>**   **2015.10 - 2015.11**
    - ✓ Independently conducted a research on the game: *Hearthstone*, analyzed its data and established a model to analyze its equity

- ➢ **The National Training Program on Undergraduate Innovation and Entrepreneurship**
  - ● **The Research and Implementation of Partner Searching Site**   **2015.09 - 2016.09**
    - ✓ Participated in the preparation of this program, assigned tasks to different team members, managed the process of the whole project, and communicated with the program mentor
    - ✓ Built the website backend with Java, Tomcat, Nginx, etc. and designed the frontend website with HTML

Internship Projects

➢ **Algorithm Engineer (Part-time), JD Co., Ltd**   **2018.07 - present**
  - Joined 2018 CVPR LIP Workshop Human Parsing Track program for the model combination job
  - Joined 2019 CVPR Image-based Multi-pose Virtual Try-on Challenge, for the application of body posture, and won the **Second Place Award in Track5**
  - Created a set of sports icon based on human poses estimated from the sports images collected from the Internet
  - Built PyAnomaly to provide methods for the video abnormal detection and to offer an effective open-source tool
  - Compressing and accelerating the large human pose estimation models

➢ **Software Development Intern, DeepAIT Co., Ltd**   **2018.04 - 2018.06**
  - Joined the program development and maintenance jobs
  - Built the human pose estimation model running on the mobile devices' CPU
  - Used OpenPose to build items to estimate the human pose in the videos

➢ **Research & Development Intern, Lenovo Co., Ltd**   **2017.06 - 2017.08**
  - Classified the faults and made the fault category model based on the dialogs between customers and engineers
  - Tried to use Deep Learning to solve dialogue classification problems by using TensorFlow

Honors & Awards

➢ **China National Scholarship**   **2020**
➢ First-Class Academic Scholarship   2019/2018
➢ **BUPT & QMUL Best Bachelor-Degree Graduation Paper Award**   **2018**
➢ **QMUL Undergraduate Collage Prize**   **2018**
➢ Second-Class Academic Scholarship   2017
➢ Students' Union Awards   2017
➢ **The MCM/ICM Meritorious Winner**   **2016**
➢ Third-Class Academic Scholarship   2016/2015
➢ Merit Student   2015

Other Experiences

➢ **Teaching Experiences**
  - Teaching Assistant for the Internet of Things of Engineering Practice   2019
  - Teaching Assistant & Lecturer of the Microprocessors System Design Teaching Assistant 2017
  - Lecturer of the Security & Authentication Tutorial   2017
  - Lecturer of the Control Theory Tutorial   2016
  - Lecturer of the Digital Circuit Design Tutorial   2016
  - Lecturer of the Signals And Systems Tutorial   2015
  - Lecturer of the Advanced Mathematics Tutorial   2014
➢ **Speech Experiences**
  - Speaker of the Personal Development Program-What Kind of Technology Can Achieve A Success? 2015
  - Speaker of the Personal Development Program-The Merits and Demerits of No-paper Society 2014

Skills

➢ Master Python and PyTorch
➢ Be Familiar with Git
➢ Know how to use the Docker and how to write DockerFile well
➢ Know Object-oriented programming languages such as C++
➢ Know Tensorflow, Caffe

Appendix 1.

Coursework Projects

- **Experiment of Analyses on CLIPS Expert System**   **2017.06**
  ➢ Introduced the **CLIPS** and its operation and reasoning mechanism
  ➢ Analyzed **CLIPS** inference procedure and methods based on the processing method of codes and systems

- **Microprocessors for Embedded Computing Coursework (QMUL)**   **2017.06**
  ➢ Used the assemble language to program a complete **8051 microcontroller** system to design a Cinema Ticket Gate Control System, and stored the ticket information in the computer database, referring to the website: *https://github.com/YuhaoCheng/8051DesignProject*

- **Software Engineering Group Coursework (QMUL)**   **2017.06**
  ➢ Served as the team leader to conduct a self-service ticketing kiosk software-developing the software using **Agile Methods**, with the help of **Java**
  ➢ Organized the meetings to discuss the development of software, assigned the jobs and monitored the progress
  ➢ Did the Junit test and some other part of test of our projects and debugged the program

- **Design and Implementation of a DNS Relay**   **2016.01**
  ➢ Searched the domain name and the corresponding IP address
  ➢ Shielded the websites that users cannot access, and used the **socket** to communicate with remote server and the local
  ➢ Learned the **DNS protocol** in the application layer of **OSI module** and the usage of the java.net package, referring to the website: *https://gitbub.com/YuhaoCheng/ DNSRelay_java*

- **Database Coursework**   **2016.12**
  ➢ Designed and implemented a relational database for Beijing subway tourism system
  ➢ Built a **Java** interface to the database suitable for the database application
  ➢ Enabled the system to provide query function for tourists who want to know how to get from A to B

- **Java Coursework of Improving Robot Employability in Restaurants**   **2016.05**
  ➢ Used the Java language to design a graphical user interface for display on the robot's chest, aiming at improving the robot's functionality and their employability in the restaurants

- **Program of Course Selection System**   **2015.09**
  ➢ Used **C language** to design the program system with the functions of course selection, course adding and deleting courses

- **Program of Math Practice**   **2014.01**
  ➢ Draw a flowchart and wrote the math practice program with the **C language**
  ➢ Ran the program and ensured pupils with an ID could practice math in the program