Dong Wu

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Profile websites: Github, Personal

Skills summary

- **Computer Languages & Tools**: Python(pytorch, numpy, pandas, scikit-learn, matplotlib, osmnx, skmob), Matlab, C, C++, Verilog, LaTeX
- **Research Interests**: Deep Learning, Machine Learning, Computer Vision(object detection, semantic segmentation), Knowledge Graph, Data Mining
- **Foreign Languages**: CET-4: 543, CET-6: 457, TOEFL: in preparation

Education

- **Huazhong University of Science and Technology(HUST)** Wuhan, China
  Undergraduate in Electronic Engineering *Sep. 2018 – Present*
  - **GPA**: 3.94/4.0 92/100
  - **Rank**: 5/335

Research experience

- **Multimedia and Communication Laboratory,HUST** Wuhan, China
  Reasearch Assistant, supervised by Prof. Wenyu Liu & A.P. Xinggang Wang *July 2019 - Present*
  - **Visual Perception System for Autonomous Driving**:
    Constructing a real-time multi-task network dealing with three tasks: object detection, drivable area segmentation and lane line detection. My main contribution: the design of multi-task network, model compression.
    * Our network has been deployed to embedded device(Jetson TX2) and can reason in real time.
    * The performance of our network handling all three tasks achieves state-of-the-art result on the BDD100K dataset.
    * Our Our experiment and deployment code are available at https://github.com/EXPmaster/JointNet.
  - **Scene Text Understanding**:
    Participating in **"Theories and Methods of Text Semantic Understanding in Images and Videos Facing Network Information Security"**, a key research project supported by the NSFC. My reasearch work mainly focuses on the application of knowledge base in visual reasoning.
    * We attempt to firstly propose a model that fuses the multi-modal features of vision and knowledge base to improve the performance of image classification. The result of our preliminary scheme: 77.1% mAP for the Drink Bottle dataset is comparable with the state-of-the-art.
    * We build a dataset for certain sensitive events image classification, and we try to use the multi-modal fusion model (vision & knowledge base) to handle this task.

Project experience

- **A National Science and Technology Major Project** Dec 2020 - Present
  Significant contributor, supervised by Prof. Wenyu Liu
  - **Project Introcuction**: Mining the adjoint and gathering pattern of spatial-temporal trajectory data, then mine human relationship, detect the community and analyze the identity of the component members.
  - **My Main Part**: Simulation and generation of spatial-temporal trajectory data. Design of the algorithm to mine adjoint and gathering pattern (cluster based & grid based).
  - **Project Progress**: Our work is rated as excellent project in the interim examination, and will be finished in May.

- **Logistics Car Reling on Pure Visual Perception** Nov 2020 - Present
  Project founder, supervised by A.P. Xinggang Wang

- **Project Introcuction**: Proposing an autonomous driving solutions reling on "GPS & Visual Perception", with the independent research and full stark development capability including chassis, structure, hardware, perception system and decision making system. We provide products and end-to-end solution of logistics car for specify scene.See About Project for details.
- **My Main Part**: Design, deployment and debugging of perception system. Integral collaboration of multiple systems.
- **Project Progress**: The design and construction of the car body as well as the perception system have been almost completed. Our logistics car is expected to launch on campus in June and will appear on the China College Students' 'Internet+' Innovation and Entrepreneurship Competition.

Publications

JointNet:A Simple and Real-time Joint Detection of Traffic Objects, Drivable Areas and Lane Lines
Dong Wu, Weitian Zhang, Manwen Liao and Xinggang Wang, *IEEE Transactions On Intelligent Transportation Systems*
In Preparation

Selected awards

- **National ScholarShip, 2020 , MOE of PRC**
- **Outstanding Undergradutes in Terms of Academic Performance, 2020, HUST**
- Merit Student, 2020, HUST
- People's Scholarship Award for studying excellent, 2019, HUST
- Third Prize in Challenge Cup School Competition, 2021, HUST
- Provincial Training Program of Innovation and Entrepreneurship for Undergraduates , 2020
- Best Popularity Award in SeedCup of Programming Challenge, 2019