Jingtun Zhang

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EDUCATION

- **University of Science and Technology of China (USTC)** — Sept. 2016 – Present
  B.S. in Computer Science — *Hefei, Anhui, China*
  Member of Hua Xia Talent Program in Computer Science and Technology
  Overall GPA: 3.67/4.30, ***Major GPA***: 3.74/4.30, ***Weighted Average***: 87.51/100
- **University of California, Santa Barbara (UCSB)** — July 2019 - Sept. 2019
  Research Intern in Computer Science — *Goleta, CA, USA*
- **Peking University (PKU)** — July 2018
  Exchange student in Computer Science — *Beijing, China*
  - *Attended 2018 AEARU(Association of East Asian Research Universities) Summer Campus activities.*
  - *Attended Deep Learning lectures given by Prof. Jian Tang and Big Data Management lectures about Modern Graph Database given by Prof. Leonid Libkin, and gave presentations about research reading.*
- **Shanghai Jiao Tong University (SJTU)** — Feb. 2018 - Jun. 2018
  Exchange student in Computer Science — *Shanghai, China*
  - *Attended Computer Network Course given by Prof. Yanmin Zhu and Built a virtual SDN network based on mininet virtual machines and tested execution perfomance details of several Internet protocols.*
  - *Attended Big Data Analysis Course given by Prof. Weinan ZHANG and Took part in Kaggle Competition of Text Classification implementing classical ML algorithms and Link Prediction implementing graph embedding algorithms.*

RESEARCH EXPERIENCE

- **Motion-Vector Based Video Object Detection** — *Goleta, CA, USA*
  Advisor: Prof. Yufei Ding — *July 2019 - Sept. 2019*
  - **Background**: Part of a Compiler Framework for Deep Stream Processing. Utilizing Motion-Vector information to accelerate Video Object Detection. Built in MxNet architecture like MSRA-DFF.
  - **Problem**: We tried to improve the quality of motion vector information in compressed domain which utilized at feature level to get a faster but slightly lower accuracy perfomance on ILSVRC2015 video object detection task.
  - **Main research contents**:
    - Rather than just scale the motion vector by 1x1 Convolutional Layer, we tried to build a more complicated MV_Net try to improve the quality of motion vector used at feature map level, getting MAP@5 = 0.6225.
    - Used DMC-Net like structure to fine-tune the motion vector, tried to gain more motion information form residual data under optical flow guidence, getting results without optical flow guidence: MAP@5 = 0.5091.
    - Tried different steps of Motion Vector Output Flow Model to approximate the result of DFF and accelerate it, trying to analyse motion vector aggregation-propagation perfomance at output level.
- **Graph Neural Networks Models Survey** — *Goleta, CA, USA*
  Advisor: Prof. Yufei Ding — *July 2019 - Sept. 2019*
  - Surveyed GNNs Models such as GCN, understood evolution from spectral models to propagation - convolution models and inspiration from CNNs to compute convolution in non-Euclidean domain.
  - Read and Profiled General GNNs Model - Message Passing Neural Network (MPNN) code.
  - Visualized Pooling effect of TopKPooling and SAGPooling algorithms in embedding domain.
  - Surveyed of Applications of GNNs Model such as Gdy-Net and Massive Parallelized Device acceleration of GNNs.
- **Research on Small Scale Object Detection Based on Deep Neural Network** — *Hefei, Anhui, China*
  Advisor: Prof. Naijie Gu — *Dec. 2018 – May 2019*
  - **Background**: Object detection analyzes the category of objects and uses the bounding box to circle the specific position of the object in the image. Performance on many benchmarks such as MS COCO and PASCAL VOC has been significantly boosted by the prevalently CNN-based pipelines like Res-Net or Faster R-CNN, But directly applying these Deep Neural Networks (DNNs) to the small objects detection tasks usually renders poor performance.
  - **Problem**: In the actual objects shadowing and small object size problem sense, most existed DNN models render weak performance. There is calling for a innovative DNNs Model or Modified Faster R-CNN Model for object detection task in the objects shadowing and small object size context such as optical remote sensing images.
  - **Main research contents**:
    - Positioning small-scale targets in images based on Faster RCNN
      - Quantifying the Anchor Scale in Faster RCNN to detect partial objects and small scale objects.
      - Optimizing model performance with various training parameters, biased fine-tuning and strategy choices

- - Finding small area candidate area proposal based on picture color features
    - Area similarity calculation based on color features with the help of computer graphic theory.
    - Small target candidate area generation with co-training proposal network assistance.
  - Computing multi-scale feature fusion and context information fusion based on convolutional neural networks
- **High quality dataset generation based on dataset quality assessment algorithm** *Hefei, Anhui, China*
  Advisor: Prof. Lan Zhang *Dec. 2018 – Mar. 2019*
  - **Problem**: Generating high-quality data sets based on existing data quality assessment algorithms, including:
    - Generating a data set that combines consistency and diversity and can be used to train the model.
    - Adding and deleting operations for a given data set at a lower cost to improve the quality of the set.
    - Sampling a high quality data set from multiple data sets as needed.
    - Generating image data sets by Generative Adversarial Network (GAN) which can be used to train the model.

PROJECTS EXPERIENCE

- **Artificial Intelligence Gomoku Gamer (Supervisor: Prof. Linli Xu)**: *Apr. 2019, Hefei*
  - Implemented Gomoku Gamer with $\alpha - \beta$ pruning algorithm in typical Game Theory manner for Intelligence.
  - Optimized by Gomoku Manual Encoding, OpenMP Parallel Computation accelerating, Optimized Pruning order and other design methodlogies based on online competition perfomance against human Gamers.
  - Presented with GUI and Achieved human-level response time, high-level strategy perfomance and well win-rate.
- **Bank Database Manage Application (Supervisor: Prof. Peiquan Jin)**: *June 2019, Hefei*
  - Implemented a full stack web-database bank database management application system.
  - Utilized Vuejs to implement web front-end user interface, security check and statistical plotting.
  - Utilized Flask to implement back-end service, including query routing, database interface operating and some application-specific numerical constrain implementing. Applied Origin 18.3 as Database Management System.
  - Built an user requirement fulfilled database scheme design, user friendly interface and robust service supporting.
- **Kaggle Competition Of Link Prediction (Supervisor: Prof. Weinan ZHANG)**: *June 2018, Shanghai*
  - Utilized Huristic Graph Embedding Algorithms such as TransE to predict potential links in an academic network.
  - Implemented Network Representation Learning (NRL) algorithms such as node2vec and DeepWalk to get node embedding and Collaborative filtering to determine potential links in similar graph structure.
- **DBWorld Search Engine (Supervisor: Prof. Peiquan Jin)**: *Jan. 2019, Hefei*
  - Built a web Search Engine for DBWorld website with a Tomcat server in respond to JSP query.
  - Implemented support to different types of Query about DBWorld Conference location, due time and so on.
  - Implemented Entity recognition algorithm to improve recall of retrieve results and Regular refreshment of indexes.
- **Erdös co-author network mining (Supervisor: Prof. Linli Xu)**: *Jan. 2019, Hefei*
  - Implemented Influncial Analysis Algorithms to find important authors, i.e. influncial nodes, in co-author graph.
  - Utilized Spectral Clustering Algorithms to analyse community structure in Erdös co-author network.

SELECTED AWARDS

- **National Scholarship (Top 5% in one academic yesr)** 2018
  The scholarship for top students given by China government
- **Scholarship in The Talent Program in Computer & Information Science** 2016, 2018
  For outstanding students selected to the talent program of computer science
- **USTC's 60th Anniversary Celebration Activity Collection Contest Winner** 2018
  For Contributing students in USTC's 60th anniversary celebration activity.
- **Excellent Social Investigator** 2018
  For Contributing students in National Social Science Funding Project Research.
- **Outstanding Student Scholarship** 2016, 2017
  For top students in USTC

SELECTED EXTRA-CURRICULAR ACTIVITIES

- **College Student Association Member & Department Leader** Oct. 2016 – May. 2018
  Organized students activities and in charge of outreach and equity work of College Student Association.
- **Class Psychology Committee** Sept. 2016 – Dec. 2018
  Organized class activities and in charge of students peer psychology health assistance.

SKILLS

- **Programming Languages**: Python, C/C++, Java, MATLAB, Verilog, HTML-CSS-JavaScript
- **Technologies** : LaTeX, Git, VueJS, Flask, MapReduce, Hadoop, CUDA, SQL/PLSQL(Origin), Microsoft Office
- **Deep Learning Platforms**: TensorFlow, Keras, Pytorch, MxNet, Scikit-learn
- **Language**: **Chinese**: Native Language, **English**: Fluent