Zhengqi(Drago) Dong

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EDUCATION

Boston University, Boston, MA (GPA: 4.00 / 4.0)   **08/2021—Expected 05/2023**

MS in Robotics & Autonomous Systems

Ohio State University, Columbus, OH (GPA: 3.65 / 4.0)   **08/2017—05/2021**

B.S Computer Science Engineering (Minor in Statistics)

Graduate with Honor in Engineering, with Honor Research Distinction in FABE.

University of Dayton, Dayton, OH (GPA: 3.82 / 4.0)   **08/2016—05/2017**

ENGINEERING EXPERIENCE

CSE3341 Project – "CORE" Language Interpreter, The Ohio State University   **01/2021—05/2021**
- Built a Scanner that parses the program from input files into a stream of CORE language tokens (defined by Instructor).
- Implemented **the recursive descent algorithm** to generate the parse tree for the input program.
- Built the **CORE Interpreter** that can interpret syntax tree, execute the input program, and reject invalid inputs with error messages.
- Utilized "call by copy return" strategy to build call stack that supports recursive function call for "CORE" language.
- Implemented the **Garbage Collector features** with reference counting approach for the CORE interpreter

High-Performance Deep Learning Research Study, The Ohio State University   **08/2020—12/2020**
- Designed various versions of model parallelisms to train out-of-core memory DNN models for U-net and ResNet-like architectures on **High-Performance Computing (HPC)** system.
- Developed, trained, and analyzed the performance (time and acc) of different DNN models on various scale of datasets by varying # of cores on CPUs/GPUs, # of batch size, learning rate, optimizers, and type of MPI communication libraries on **OSU Supercomputing Center.**
- Benchmarked the performance of various ML algorithms supported by the Dask-ML library and conducted on OSC cluster to provide visualized task graphs via Dask Dashboard and port forwarding technology.

CSE 5525 Foundations of Speech and Language Processing, The Ohio State University   **08/2020 – 12/2020**
- Accomplished following algorithms from scratch: Naïve Bayes/Logistic Regression Classifier, HMM(Hidden Markov Model)/CRF(Conditional Random Field) Tagger, Attention Based Encoder-Decoder Model.
- Devised and implemented a **hybrid filtering recommender system** with **TensorFlow** for course final project, which integrated metapath-based heterogeneous network for graph embedding and doc2vec for text-embedding methods to achieve ~33.1% accuracy for an unseen movie rating score.

Deep-Learning Based Plant Disease Diagnosis System, Honor Research Project, The Ohio State University   **01/2020—05/2021**
- Conducted Deep Learning research on various object detectors and backbone DL architectures for the PlantVillage disease dataset, e.g., InceptionNet, ResNet, and NASNet, and MobileNet.
- Selected and analyzed the most suitable deep learning model for plant disease detection, which had achieved 99.5% acc for training and 98.11% for validation over 20 hours of training.
- Awarded $5500 scholarship by College of Engineering towards "Research Distinction" or "Honors Research Distinction" thesis application.

CSE4471 Information Security Final Project – Spam Filter Detector, The Ohio State University   **05/2020—07/2020**
- Data pre-processing: extracted text body from MIME email format; split dataset to training, validation, and testing; tokenized sentence and removed stopwords for feeding to neural networks.
- Compared different neural network models for text embedding, including **Gated Recurrent Unit (GRU), Bidirectional Long short-term memory (LSTM),** and **the Global Vector (GloVe)** language model on spam email detector on Apache SpamAssassin open-source dataset.
- Achieved 99.5% acc in training and 96% for validation, and further visualized word embedding vectors in **TensorBoard.**

CSE2421 Operation System Project: Air Traffic Control Simulator, The Ohio State University   **08/2019 – 12/2019**
- Created an Air Traffic Control Simulator in **C** including a character-based graphical display with over 800 lines of code spanning decades of files.
- Wrote **generic linked-list** usable with any data type and proven to handle memory allocation failures.
- Used **curses library** for display control, nanosleep function to accelerate simulation process.
- Used dynamic memory allocation and gracefully deals with allocation failures.
- Dealt with numerous unit conversions for heading speed, heading degree, screen size, flight position, etc.

CSE3901 Web Application Final Project: Freelance Canvas Web Application, The Ohio State University   **05/2019—07/2019**
- Designed web frontend interface features such as like, follow, and comment with **Ruby on Rails**, **CSS (Bootstrap),** and **HTML.**
- Implemented password registration, confirmation, recovery, authentication feature with Device library in **Ruby.**
- Designed database for users with ER-diagram and SQLite.

AI Team Member, 2019 RoboMaster Competition at Shenzhen, IEEE Undergraduate Chapter   09/2018—05/2019
- Tagged ground truth labels and bounding boxes over 500 pictures clipped from past competition videos.
- Tested and evaluated performance and accuracy of three robots' aiming systems.
- Practiced the maneuvering operation of Standard Robot and Drone with remote controller in a self-build battlefield.

Member of Connected and Autonomous Vehicles (CAVs) teams, OSU EcoCAR 3 Competition   08/2018—12/2018
- Codded **Kalman Filter (KF)** and Extended Kalman Filter (EKF) with **Python** and **MATLAB** to develop a robust sensor fusion algorithm for line detection and following.
- Analyzed old EcoCar3 Architecture and **Version Control system** and introduced basic mechanisms of GitHub.

2018 IEEE SAC Micromouse competition at Pittsburgh, IEEE Undergraduate Chapter   01/2018-04/2018
- Coded the DFS/BFS/Uniform cost/A* search algorithm with Python on Micromouse robot to search the shortest path in a maze

SKILLS

Related Coursework
- Machine Learning, Neural Network, High-performance Deep Learning, Natural Language Processing, Algorithm & Data structure, Operation System, Principles of Programming Languages, Networking, Information Security, Web Development, Database Systems
- Probability & Statistic, Statistical Modeling, Spreadsheet and Database modeling with Excel and Access, Analog & Digital Circuits

Techniques and skills
- Programming languages:
  - ❖ Prefer Python (certified TensorFlow Developer), C (familiar with GDB, valgrind, makefile)
  - ❖ Experienced with R (experienced with tidyverse and shiny), Java, Ruby (experienced Ruby on Rails), SQLite, X86 Assembly Language, HTML, CSS, JavaScript, MATLAB, Bash Script
- Technologies:
  - ❖ Distributed Deep Learning in HPC environment: Familiar with TensorFlow/PyTorch/LBANN deep learning framework, Horovod/Dask/mpi4py python library, and Slurm/PBS scheduler
  - ❖ Software Development Environment: PyCharm, RStudio, Visual Studio, Eclipse, Linux/Unix, Git version control, AWS(Cloud 9), SolidWorks, Arduino
  - ❖ Microsoft Office: Access, Excel, Word, PPT, Outlook
- Languages: English, Chinese (Native)

LEADERSHIP & ACTIVITIES

Student Instructional Assistant, The Ohio State University, Columbus, OH   08/2020—05/2021
- Teaching assistant and grader for CSE 3461 (Computer Networking and Internet Technologies) under Jim Vickroy's supervision through the Department of Computer Science.
- Required to oversee lab sections, maintain weekly office hours, and grade student homework and projects.

WebMaster, IEEE at OSU Undergraduate chapter, Columbus, OH   01/2018—05/2021
- Updated and maintained IEEE's website (https://ieee.osu.edu/) powered by WordPress Content Management System (CMS) and routinely posted newest organization events and activities.

Vice-president, OSU Table Tennis Club, Columbus, OH   05/2019—05/2020
- Conducted weekly training sessions and coached fundamental skills to improve member's serving, flicking, looping, and striking ability.
- Cooperated with other club officers to manage the 2019 NCTTA tournament plan at Iowa University, Friendship Cups at the University of Toledo, and various seasonal tournaments.
- Cooperated with Nike's "Project Move" program to deliver and promote table tennis culture and spirit.

Student Volunteer, Mid-Ohio Workers Association, Columbus, OH   10/2017—01/2018
- Wrapped gifts during Thanksgiving, set up family events for Christmas dinner, delivered donated food to low-income families, helped to edit photos, and canvassed hundreds of neighbors.

Volunteer of Kroger Pantry Indoor Assistant, Mid-Ohio Foodbank , Columbus, OH   2017(~30 hr in total)
- Assisted warehouse manager in organizing and packing foods, stored them in warehouse, and distributed to customers.

Student Operations Assistants, University of Dayton Residential Property, Dayton, OH   05/2017—07/2017
- Diagnosed and noted all damaged walls, outlets, and furniture throughout about 300 dormitories.
- Tracked inventory, coordinated logistics, and collaborated with the team to replace all unusable or old furniture.
- Cleaned and discarded all spoiled foods and clothes abandoned in cabinet and wardrobe.

HONORS AND AWARDS
- Achieved Dean's List (>3.5 GPA) over five semesters, an active Honor student in OSU and Honor Collegian Program.
- Awarded 2020, 2021 IEEE Excellent Service Award, active IEEE members (Student Member, 2018–Present).
- Activate NCTTA(National Collegiate Table Tennis Association) member (Student member, 2018—Present)
- Personal interest: Table Tennis (>5 years professional practices), Martial Art (Achieved Green Belt in 3 months), Climbing, Track and Field, Scuba Diving (Certified Open Water Diver), Photography, Cooking, Snowboarding, and Traveling.