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)

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

University of Dayton, Dayton, OH (GPA: 3.82 / 4.0)   08/2015—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 with **PyTorch**: 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.
- Developed and analyzed the most suitable deep learning model with **TensorFlow** on OSU Supercomputing Center 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:
  - ❖ Fluent with Python (certified [Google TensorFlow Developer](#)), and C (including GDB, valgrind, makefile)
  - ❖ Experienced with R (including tidyverse and shiny), Java, Ruby (including Ruby on Rails), SQLite, X86 Assembly Language, HTML, CSS(including Bootstrap), 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(including Cloud 9), SolidWorks, Arduino
  - ❖ Microsoft Office: Access, Excel, Word, PPT, Outlook
- Languages: English, Chinese (Native)

LEADERSHIP & ACTIVITIES

WebMaster, Student Association of Graduate Engineers (SAGE) at Boston University, Boston, MA   08/2021 --- Present
- Planned and Organized two annual events (whale watching and nutcracker)
- Atteneded monthly board meeting and discussed any new change to the website, https://www.bu.edu/sage/
- Updated new annocements and events, maintained website contents' quality aligned with requirments

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.

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.