Zhengqi(Drago) Dong

614-592-5333 | dong.760@osu.edu | https://drago1234.github.io/ | https://www.linkedin.com/in/zhengqi-dong/

EDUCATION

Boston University, Boston, MA (Expected graduation: May 2023)

MS in Robotics & Autonomous Systems

Ohio State University, Columbus, OH (August 2017 -- May 2021) GPA: 3.65 / 4.0

B.S Computer Science Engineering (Minor in Statistics)

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

University of Dayton, Dayton, OH (August 2016 – May 2017) GPA: 3.82 / 4.0

ENGINEERING EXPERIENCE

CSE3341 Project – "CORE" Language Compiler, The Ohio State University (Jan 2021 – Present)

- 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.
- Used the "call by copy return" approach to build the call stack to support recursive function call for "CORE" language.
- Implemented the Garbage Collector features with reference counting approach

High-Performance Deep Learning Research Study, The Ohio State University (Aug 2020 – Present)

- Designed various versions of model parallelism 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, optimizer, and type of **MPI communication libraries** on OSU Supercomputing Center (OSC).
- Designed and benchmarked the performance of different ML algorithms supported by the Dask-ML library on OSC cluster and provided the visualized task graphs and process utilization through Dask Dashboard via the port forwarding technology.

CSE 5525 Foundations of Speech and Language Processing, The Ohio State University (Aug 2020 – Present)

- Implemented the following algorithms from scratch: Naïve Bayes/Logistic Regression Classifier, HMM(Hidden Markov Model)/CRF(Conditional Random Field) Tagger, Attention Based Encoder-Decoder Model.
- Designed and implemented a **hybrid filtering recommender system** with **TensorFlow** for the course project, which integrated metapath-based heterogeneous network to generate graph embedding and doc2vec to generate text embedding to achieve ~33.1% rating accuracy for the an unseen movie.

Deep-Learning Based Plant Disease Diagnosis System, Honor Research Project, The Ohio State University (August 2019 – present)

- Conducted the benchmark testing for various object detectors and backbone DL architectures for the PlantVillage disease dataset, e.g., InceptionNet, ResNet, and NASNet, and MobileNet.
- Fine-tuned the InceptionV3 model and achieved 99.5% acc for training and 98.11% for validation with 20 hours of training.
- Award $5500 scholarship by College of Engineering towards "Research Distinction" or "Honors Research Distinction".

CSE4471 Information Security Final Project – Spam Filter Detector, The Ohio State University (May-July 2020)

- Data pre-processing: extracted the text body from MIME email format; split dataset to training, validation, and testing; tokenized sentence and removed the 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 the spam email detector on Apache SpamAssassin open-source dataset.
- Achieved 99.5% acc in training and 96% for validation, and further visualized the word embedding vector in TensorBoard.

CSE2421 Operation System Project: Air Traffic Control Simulator, The Ohio State University (August – Dec 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 the 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 (May-July 2019)

- Designed the web frontend interface features such as like, follow, and comment with **Ruby on Rails**, **CSS(Bootstrap),** HTML.
- Implemented the password registration, confirmation, recovery, authentication functions with Device library in **Ruby**.
- Designed the database for users with **ER-diagram** and **SQLite**.

OSU Data-IO 6-hr Competition — winner of Mid-Ohio Food Bank Challenge (October 2019)
- Reformatted/cleaned/processed/fitted data and produced the visualization result to the final report.
- Conducted time series analysis (identify the seasonality/stationarity/trends/autocorrelation) on the consumer flow volume and improved logistic management.

AI Team Member, 2019 RoboMaster Competition at Shenzhen, IEEE Undergraduate Chapter (September 2018 – May 2019)
- Tagged the ground truth labels and bounding boxes over 500 pictures clipped from the past video.
- Tested and evaluated the performance and accuracy of three robots' aiming systems.
- Practiced the operation of Standard Robot and Drone with remote controller in a simulated battlefield.

Member of Connected and Autonomous Vehicles (CAVs) teams, OSU EcoCAR 3 Competition (August 2018 – December 2018)
- Used **Python** and **MATLAB** to implement the **Kalman Filter (KF)** and Extended Kalman Filter (EKF) to develop a robust sensor fusion algorithm for line detection and follow.
- Analyzed the old EcoCar3 Architecture and **Version Control system** and introduced the basic mechanisms of GitHub.

2018 IEEE SAC Micromouse competition at Pittsburgh, IEEE Undergraduate Chapter (January 2018 – April 2018)
- Programed 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:
  - ❖ Proficient in C(familiar with GDB, valgrind, makefile) and Python (certified TensorFlow Developer)
  - ❖ Familiar 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)

EXTRACURRICULARS

Student Instructional Assistant, The Ohio State University, Columbus, OH (Aug 2020 – Present)
- 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 (January 2018 – Present)
- Designed and maintained IEEE's website(https://ieee.osu.edu/) powered by Drupal Content Management System (CMS) and routinely posted newest organization events and activities.

Vice-president, OSU Table Tennis Club, Columbus, OH (May 2019 – May 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 (Oct 2017– Jan 2018)
- Wrapped gifts during Thanksgiving, set up family events for Christmas dinner, delivered donated food to low-income families, helped to edit photos, and canvased hundreds of neighbors.

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

Student Operations Assistants, University of Dayton Residential Property, Dayton, OH (May 2017-July 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 the cabinet and wardrobe.

HONOR AND ACTIVITIES

- 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 (Red Belt), Climbing, Track and Field, Scuba Diving (Certified Open Water Diver), Photography, Cooking, Camping, Skiing/Snowboarding, and Traveling.