Zhengqi(Drago) Dong

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

EDUCATION

Boston University, College of Engineering, Boston, MA **Expected 12/2022**
MS in Robotics & Autonomous Systems

The Ohio State University, College of Engineering, Columbus, OH (GPA: 3.67/4.0) **05/2021**
B.S Computer Science Engineering (Minor in Statistics)
Graduated with Enginering Honors Degree, and Honors Research Distinction

Related Coursework: Medical Robotic, Robotic Autonouomous System, Cyber-Physical System, 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

PROJECTS AND RESEARCH

"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

MapReduce Emulator, The Ohio State University 08/2020 - 12/2020
- Tested various model parallelism methods to speed up the training of out-of-core memory DNN models, such as U-net and ResNet-like architectures, in a High-Performance Computing (HPC) environment.
- 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

Filmpedia -- Movie Recommendation Website: **,** The Ohio State University 08/2020 - 12/2020
- Coordinated with three other senior students to develop a dynamic movie recommendation website by using Django as backend and React.js as frontend.
- Accomplished various useful features including user and movie database, routes configuration, multi-languages support, movie recommendation, and searching by leveraging IBM Cloud Platform and TMDB RESTful APIs.

Achieved automated deployment by containerizing the application with Docker and launching via Heroku.

High-Performance Deep Learning Research Study, The Ohio State University 08/2020 - 12/2020
- Tested various model parallelism methods to speed up the training of out-of-core memory DNN models, such as U-net and ResNet-like architectures, in a High-Performance Computing (HPC) environment.
- Analyzed the performance (time and acc) of different DNN models on various scales 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.

NLP Project -- Recommender System, The Ohio State University 08/2020 - 12/2020
- Accomplished the 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.
- Developed a hybrid filtering recommender system with TensorFlow by integrating metapath-based heterogeneous network for graph embedding and doc2vec for text-embedding methods to achieve ~33.1% accuracy.

Honor Research Project -- Deep-Learning Based Plant Disease Detection, The Ohio State University 01/2020 - 05/2021
- Awarded $5500 scholarship by proposing an image-based deep learning approach and application framework design for plant leaves disease detection.
- Compared pros and cons of approaches between machine learning and deep learning-based detection.
- Conducted sequences of experiments on multiple factors including train-validation split ratio, batch size, and complexity size of pre-trained models, which resulted in 99.5% and 98.11% accuracy in training and validation perspectively.
- Completed "Honors Research Distinction" thesis by authoring and presenting multiple deliverable works of literature, including over 70+ pages thesis, presenting a poster in two research forums, and oral defense presentation.

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.
- Developed a spam email detector with 99.5% training acc by constructing 6 layers neural network and training the model on Apache SpamAssassin open-source dataset with Stanford Global Vector (GloVe) text embedding representation.

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.

Web Development Project: Freelance Canvas Web Application, The Ohio State University 05/2019 - 07/2019

- Designed web frontend interface features such as like, follow, and comments by using 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.

OSU Data-IO 6-hr Competition -- winner of Mid-Ohio Food Bank Challenge, The Ohio State University 10/2019 - 10/2019

- Reformatted, cleaned, fitted data and produced visualization results for final report.
- Conducted time series analysis (identify seasonality/stationarity/trends/autocorrelation) on consumer flow volume and improved logistic management.

2018 IEEE SAC Micromouse competition at Pittsburgh 01/2018 - 04/2018

- Coded DFS/BFS/Uniform cost/A* search algorithm with Python on Micromouse robot to search the shortest path in a maze.

SKILLS

Programming languages: Python(Django, Flask, PyTorch, and certified Google TensorFlow Developer), and C(GDB, Valgrind, makefile), R(tidyverse and shiny), Java, Ruby(Ruby on Rails), SQLite, X86 Assembly Language, HTML, CSS(Bootstrap), JavaScript(React.js), MATLAB, Bash Script, LaTeX
High-Performance Computing Applications: TensorFlow/PyTorch/LBANN deep learning framework, Horovod/Dask/mpi4py library, and Slurm/PBS scheduler, distributed training concept(model/data/hybrid parallelism, MPI operations)
Software Applications: PyCharm, RStudio, Visual Studio, Eclipse, Linux/Unix, Git version control, AWS(Cloud 9), Docker, Heroku, CAD(SolidWorks).
Hardware Applications: Arduino, Jetson Nano, Milling, 3D Printing
Languages: Chinese

LEADERSHIP & ACTIVITIES

WebMaster, Student Association of Graduate Engineers (SAGE) at Boston University, Boston, MA 08/2021 - Present
WebMaster, IEEE at OSU Undergraduate chapter, Columbus, OH 01/2018 - 05/2021
Vice-president, OSU Table Tennis Club, Columbus, OH 05/2019 - 05/2020
Student Volunteer, Mid-Ohio Workers Association, Columbus, OH 10/2017 - 01/2018
Volunteer of Kroger Pantry Indoor Assistant, Mid-Ohio Foodbank , Columbus, OH 2017(~30 hr in total)
High School Robotic Team Mentor, Bonds FRC 5811, OH 11/2016 - 05/2017

EXPERIENCE

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).
- Oversaw lab sections, maintain weekly office hours, and grade student homework and projects.

AI Team Member, 2019 RoboMaster Competition at Shenzhen 09/2018 - 05/2019

- Developed a customized Object Detection program with Yolo-v3 model by clipping over 1000 pictures from past competition videos and labeling bounding box over the ground truth objects.
- Practiced maneuvering console of Standard Robot and Drone in a self-build battlefield.

Member of Connected and Autonomous Vehicles (CAVs) teams, OSU EcoCAR 3 Competition 08/2018 - 12/2018

- Coded 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.

Student Resident Housing Assistant, 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 team to replace all unusable or old furniture.
- Cleaned and discarded all spoiled foods and clothes abandoned at cabinet and wardrobe.

HONORS AND AWARDS

- Dean's List (>3.5 GPA) over five semesters, and graduated with Honor in Engineering, and Honor Research Distinction with Department of Food, Agricultural and Biological Engineering (FABE).
- 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 (>five years professional practices, awarded team champion at 2018-19 NCTTA Midwest Tournament), Martial Art (Green Belt, achieved three gold medals in Ohio International Chinese Martial Art Championship), Track and Field, Scuba Diving (Certified Open Water Diver), Photography, Cooking, Snowboarding.