

Duolei Wang

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Education

The Chinese University of Hongkong, Shenzhen	Sept. 2024 – Current
Enrolled in the PhD program of Computer and Information Engineering(CIE) at 24Fall.	
Southern University of Science and Technology , BS in Math and Applied Math	Sept. 2020 – July 2024
<ul style="list-style-type: none">• GPA: 3.48/4.0 (Rank: 21/46, Credits: 165/135)• <i>Main Courses</i>: Linear Algebra, Calculus, Probability, Analysis, Advanced Algebra, ODE/PDE. Data Structure and Algorithm Design, Machine Learning.	

Research Experience

Neural Network for PDE, Southern University of Science and Technology	July 2023 - Nov. 2023
Director: Prof. Zhen Zhang and Dr. Yang Li	
<ul style="list-style-type: none">• I learned NN with my senior and build a self-used framework for NN building.• I implement some classic NN methods in Pytorch, including PINNS.• I contribute to my senior's work about Neural Galerkin method.	
The GEARS Program, North Carolina State University	July. 2022 – Aug. 2022
Director: Prof. Zhilin Li, Dept. Math	
<ul style="list-style-type: none">• A research training program where I've learned the fundamentals of Machine Learning. I learned the theory of unsupervised learning and implemented the KNN algorithm in Python manually.	

Work & Intern Experience

Goldfish Scheme, Zhejiang Liii Network Co., Ltd. (Developer)	Oct. 2024 – Present
<ul style="list-style-type: none">• Implement SRFI libraries in Scheme by literate programming.• Write document for the Goldfish Scheme.• Implement Scheme Interpreter with the macro system.	
AI for Math, BICMR, Peking University (Participant)	Jan., Aug. – Sept. 2024
<ul style="list-style-type: none">• Learn Functional Programming in LEAN4, typed language implementation.• Formalize Untyped Lambda Calculus, BCD, Adam Algorithm in LEAN4.	

Technical Report

- Goldfish Scheme: A Scheme Interpreter with Python-Like Standard Library. [1]

Awards

The Second, First Class of Reading Star of SUSTech Library	2023, 2024
Honorable Mention of Mathematical Contest in Modeling of the United States	2022
The Second, Third Class of Merit Student Scholarship	2021, 2022
Second Prize of The Chinese Mathematics Competitions, Guangdong Province	2021
Recognition Award of Freshman Scholarship	2020

Projects

Simple in Type Haskell (GitHub: typed haskell) <ul style="list-style-type: none">• I'm learning how to design a DSL with Type System, and the progress are archived in the repo.• Tools Used: Haskell, GADT.	Oct. 2024
Scheme-Interpreter with Hygienic Macro (GitHub: scheme-interpreter) <ul style="list-style-type: none">• Based on ParserC and Syntax Closure methods, I implement a Scheme interpreter support syntax define.• Tools Used: Haskell, ParserC Library.	Oct. 2024
SUSTech Bachelor Thesis in Typst (GitHub: sustech-thesis) <ul style="list-style-type: none">• Migrate the SUSTech bachelor thesis template (in Word and \LaTeX) into Typst.	May 2024
Formalization of STLC in Lean (GitHub: lean4-grouptask) <ul style="list-style-type: none">• Implemented a formal Simple Type in LEAN4, under the help Promgramming Language For Agda.	Jan. 2024
A Tensor Library in C++ (GitHub: tensor lib) <ul style="list-style-type: none">• A cooperation work of tensor library in C++. Use many CPP17 features.• We manage the memory by shared_ptr, store the data in a continuous address, and calculate the index manually.	Jan. 2024
Traffic Sign Detection and Recognition in Python (GitHub: TSDR Report) <ul style="list-style-type: none">• The report of final project in course CS405 Machine Learning.• In the course, we argument some computer vision algorithms and train a model in a server.	July 2023
Basic Numerical Algorithms in Julia (GitHub: numerical Julia)	Nov 2023
Tetris Game (GitHub: tetris game)	May 2022
2D N-Body simulation (GitHub: 2d n-body)	Dec 2021
Minesweeper Game (GitHub: minesweeper)	May 2021

Technical Skillset

Programming Languages:

- Haskell (Proficient in DSL design),
- Lean 4 (Math Formalization),
- Python (Data Science),
- C/C++ (Algorithm Design),
- Common Scheme (Library Development).

Tools: Git, Linux, Typst, \LaTeX , \TeX , \TeX MACS

References

- [1] Da Shen, Nian Liu, Yansong Li, **Duolei Wang**, and Leiyu He. *Goldfish Scheme: A Scheme Interpreter with Python-Like Standard Library*. LIII NETWORK, 2024.