

## EDUCATION

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### Beihang University, Shen Yuan Honors College

Sept. 2019 – Present

#### Major in Computer Science

- CS-related GPA: **3.88**/4.0, CS-related Weighted Average Score: **93**/100
- Overall GPA: **3.84**/4.0, Weighted Average Score: **92**/100
- Programming Skills: Proficient in Java, familiar with Python(Pytorch), MySQL, Redis, RocketMQ and Git
- English Skills: IELTS: 7.5 / 9 GRE: 323 / 340 (Verbal: 153 / 170, Quantitative: 169 / 170)

#### Main Courses and Scores

Higher Algebra (2)	100	Object Oriented Design and Construction	97
Mathematical Analysis (1)	96	Swift Programming Experiments	98
Probability Statistics (A)	99	Assembly Language for x86 Processors	100
Discrete Mathematics (1)	98	Discrete Mathematics (2)	94
Computer Organization	94	Formal Language and Automata	96
Data Structure	90	IoT and Big Data Systems Design	100
Operating System	93	Principles of Database Systems	95
Compiler Technology	92	Mathematical Modeling	92

#### Awards and Honors

- 3<sup>rd</sup> Prize of nation, 1<sup>st</sup> Prize of Beijing, in Lanqiao Cup National Programming Competition
- 2<sup>nd</sup> Prize in Feng Ru Cup Competition of Beihang University
- Merit Student of Beihang University
- 1<sup>st</sup> Prize of Academic Competition Scholarship of Beihang University, (2020, 2021, 2022)
- 2<sup>nd</sup> Prize of Excellent Learning Scholarship of Beihang University, (2020, 2021, 2022)
- 2<sup>nd</sup> Prize of Excellent Social Work Scholarship of Beihang University, (2020)

## INTERNSHIP

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### ByteDance, Beijing

July. 2022 – Sept. 2022

#### Back-end Intern of Master Data Department of Lark Suite

Responsible for data management (query, storage and transfer) and participated in three important projects as below:

#### Message Deduplication of the ETL Module

- Combined the messages with same content in the Message Queue of ETL module, which reduced the pressure of query interfaces of Vault Service
- Chose distribution architecture based on Partition Key of RocketMQ rather than centralized architecture based on Redis, to avoid complex and inefficient lock operation and consideration
- Changed the offset of RocketMQ to the one before fault for disaster recovery, which assured the consistency of data and no messages loss

#### Optimization of Data Table Design

- Changed the *manage\_relations* table which has been put into use into *job\_data* table, because of the poor performance on both function and efficiency of the former one, due to the imperfect design before
- Kept two tables working simultaneously using double-write strategy to avoid data loss and pollution
- Wrote Go script to assure the correctness of combination and storage of data
- Increased the rate of flow online slowly, which prevented huge online fault during the table-change process

#### MultiGeo Function of Vault Service

- Transferred the sensitive information of Singapore employee from China to Singapore, due to the legal requirements
- Used the strategy of soft deletion followed by a hard deletion, which avoided data loss in transfer process
- Added the support for cross-region storage and cross-region query for Vault Service

## PROJECT

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### Multifunctional Movie Website

Sept. 2021 – Dec. 2021

*Principles of Database Systems Course Project*

- Developed a website for watching movies, deployed it on my private cloud server already
- Click to visit (<http://movie.ito.vin/>), Account:123, Password:123 for tourist
- Used Vue and Django frame to build the front and back end respectively, and chose MySQL as database
- Built E-R Diagram to design tables which met the requirement of 3NF for a trade-off between stability and efficiency
- Improved the security of website via anti-injection of database and ciphertext of password storage

### SysY-based Compiler

Sept. 2021 – Dec. 2021

*Compiler Technology Course Project*

- Built a compiler using Java, which can transform SysY (a subset of C) from source code to MIPS assembly code
- Included modules of Lexical Analysis (Automata Theory-based), Syntax Analysis (Recursive Descent-based), Semantic Analysis (Abstract Syntax Tree-based), Middle Code Generation (Quaternary Formula-based), Target Code Generation (MIPS-based)
- Optimized the compiler via Inline Function, Loop Optimization, Register Allocation Optimization, among others

### ARC-based Page Replacement

May. 2021 – June. 2021

*Operating System Course Project*

- Simulated the page replacement of cache in operating system, and used Adaptive Replacement Cache (ARC) algorithm to decrease miss rate, which considered both recency and frequency, with adaptivity to the current memory access mode by adjusting capacity of cache for both dynamically
- Built data structure with specific function and low memory usage from scratch rather than using STL container
- Ranked 1/250 (according to the weighted result of perf instruction on Linux operating system)

### Elevator System Simulator

Mar. 2021 – Apr. 2021

*Object Oriented Design and Construction Course Project*

- Used multithreading of Java to simulate the elevator system to deliver people to their target floor with the least time
- Considered the load and number of elevators, used the LOOK scheduling algorithm for each individual elevator, and global transfer strategy to arrange all elevators to reach the least total of waiting time

### Social Relation System

Mar. 2021 – Apr. 2021

*Object Oriented Design and Construction Course Project*

- Developed a simple social relation simulator, supporting making groups, sending red envelopes and messages between users, querying the real-time status of the system, and managing kinds of exceptions
- Built a debugging program to assure the correctness and real-time via black-box and white-box testing, and stress testing, respectively

## RESEARCH

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### VLN Model Optimization

May. 2022 – Present

*Research Assistant, Supervised by Prof. Si Liu*

- Proposed the Structured state-Evolution (SEvol) module to solve the flaw of over-compression of object-level spatial-temporal information in NvEM, and enhanced the performance of it on R2R, R4R and REVERIE datasets
- Based on A2C algorithm, used Reinforced Layout clues Miner (RLM) module to select objects appropriately
- Employed Dynamic Graph Neural Network (DGNN) to aggregate the spatial-temporal information of objects
- Based on GRU model, proposed mGRU model (matrix version), accomplished the renewal of weight in DGNN at every time step

### Interactive Robotic Dog

Oct. 2021 – May. 2022

*Research Assistant, Supervised by Prof. Si Liu*

- Built a robotic dog with the function of voice interaction and guiding the blind
- Implemented object detection and speech recognition module based on YOLOv5 and CMUSphinx respectively
- Implemented main control module based on SDK of motion and information generated by two modules mentioned