Minyang Bao

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Education

University of Chinese Academy of Sciences (UCAS), Beijing, China 2022.09 – Present

Master in Computer Architecture & System, expected June. 2025

- GPA: 3.45/4.0, Average Score: 81/100
- Major Course: Computer Architecture, Concurrent Data Structures and Multi-Core Programming, Advanced Operating System(95')

Northeastern University, Liaoning, China 2017.09 – 2021.06

Bachelor in Computer Science (CS)

- Overall Ranking: 8%
- GPA: 3.81/5.0 (Ranked 15%), Average Score: 88/100
- Major Course: Computer Architecture(96'), Operating System(94'), Compilation Principle(94'), Linux Kernel Analysis(98'), Data Structure(89'), Assembly Language Programming(92'), Computer Network
- Outstanding Graduation Thesis: *Design and implementation of a simple 32-bit operating system*

Project Experience

Huawei Technologies Co., Ltd., China 2023.06 – 2024.08

Intern in 2012 Lab, Central Research Institute

Brief introduction: For the next generation of new storage media, we use SSD and Tape to form a heterogeneous storage device, called **magnetoelectric device**. On the basis of ensuring QoS, this device is expected to exceed HDD in performance and cost less than HDD. We modeled the tape device, and developed a heterogeneous storage system simulator of SSD and tape based on the open source DiskSim simulator.

- **Workload analysis**: Analyze the IO characteristics of typical applications from different aspects to provide workload to the simulator, and use Rust to write a command line tool for customizing workload generation.
- **Cache module**: Based on Disksim simulator, the cache module is implemented in C language. The cache adopts set-associative strategy, uses a data structure based on linked lists and hash tables, and implements two cache replacement algorithms LRU and FIFO.
- **Cache allocation**: Based on the *exponentially weighted moving average (EWMA)* algorithm, state machine mechanism and cache window mechanism, a dynamic heterogeneous cache allocation algorithm is implemented in distributed scenarios. By dynamically adjusting the size of cache allocation, the cost of unit cache is reduced while ensuring the user's SLO. Patent application is currently underway.
- **Tape model**: A seek time model was established based on the physical structure of IBM's LTO-9 tape. The seek latency and transmission latency were simulated in the simulator using C language. At the same time, we wrote the SCSI driver for tape, built a test environment for real device. The final simulation accuracy is within 1% compared with the real device, which is a pioneering work in the field.
- **SSD & tape heterogeneous simulation**: Based on the work above, a heterogeneous system is formed, where SSD is used as a cache device and tape is used as a capacity device. Currently, the simulator can support and stably run TB-level cache and workloads. The ultimate goal is to explore under what workload characteristics and what cache replacement strategy can make the performance of the heterogeneous system exceed that of HDD and the cost lower than HDD while meeting the user QoS (in progress).

Design and implementation of a simple 32-bit operating system 2021.01 – 2021.06

Graduation Project

Brief introduction: Starting from the boot program, it enters the protected mode from the real mode to realize a 32-bit operating system, including interrupt module, memory management module, and process management module. I implement a simple graphical interface by writing to the video memory, and design fonts and forms to interact with users through the terminal.

- **Kernel boot**: Written in assembly language, BIOS loads the master boot record to memory address 0x7C00, loads the kernel to 0x8000, and enters 32-bit protected mode from real mode, sets global descriptors. Implements interrupts through interrupt descriptors, interrupt handling functions and 8259A controller.
- **Graphics and char input**: Implement graphical interface, draw mouse and realize its movement; design fonts, implement ASCII input and display by writing video memory and combining clock interrupts, which supported shift and caps keys; and implemented local refresh mechanism of layers, which improved the performance of layer refresh by nearly a thousand times compared with the global refresh mechanism.
- **Kernel module**: Detect memory through BIOS int 15h interrupt, implement memory management module based on First Fit algorithm, implement process management module based on time slice, implement process scheduling mechanism based on priority and multilevel feedback queue scheduling.
- **Application**: Implement a simple console, including printing memory, copyright, screen clearing command and scrolling mechanism, which can realize cursor flashing, window focus switching and dragging.

National University of Singapore 2019.07 – 2019.08

Summer Camp 3 weeks

Brief introduction: This project is a summer camp activity held by the School of Computer Science at NUS. Students will attend classes in the first two weeks, and then work in groups to complete a project. The project we chose is researching how to use smart contracts to avoid cheating in the game Cup Shuffling.

- Demonstrate the basic principles and processes of smart contracts and blockchain in games.
- Working in groups to come up with ideas to avoid cheating in the Cup Shuffling game.
- Getting *A+* rating.

Academic Publication

1. Yiyao Wang, **Minyang Bao**(Co-author), He Luan, Di Zhao, Jing Wang, Ruijia Shi, Yue Liu. (2020.10). COVID-19 Epidemic Manager Mini Program.
2. Feng Li, Jiajia Dong, Mengke Cao, Yuqing Lan, Quanming Liu, **Minyang Bao**, Jiemin Liu. (2021.03). Opportunistic network routing and forwarding method based on computable AP.

Honors and Awards

Competitions

- *National 3rd Prize*, Award in *Blue-Bridge-Cup Programming Contest* 2019.04
- *Provincial 1st Prize*, Award in *Blue-Bridge-Cup Programming Contest* 2019.07
- *Provincial 2nd Prize*, Award in *College Student Programming Contest* Twice
- *Provincial 1st Prize*, Award in *"Innovation, Creativity and Entrepreneurship" Challenge* 2020.06
- *Provincial 2nd Prize*, Award in *"Challenge Cup" National Science and Technology Competition* 2018.09

Honors

- *Merit student*, Award on University of Chinese Academy of Sciences 2023
- *Outstanding student model*, Award on Northeastern University 2021
- *Outstanding graduate*, Award on Northeastern University 2021
- *Merit student*, Award on Northeastern University 2020

Scholarships

- *2nd Prize*, Award on Northeastern University Twice
- *3rd Prize*, Award on Northeastern University Four times
- *Innovation and Entrepreneurship Scholarship*, Award on Northeastern University Twice
- *Individual scholarship*, Award on Northeastern University 2019.07

Skills

- Programming Languages: C/C++, Rust, Python, Java, Shell
- *Linux*, *shell scripts* to automate work, *make, awk, vim, git* and other software and tools
- Good code standards, document organization and communication awareness
- Personal blog, publishing about 60 technical blogs (Link: `https://cherryyang05.github.io/hexo-blog`)

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Academic Transcript of Northeastern University at Qinhuangdao

Name	Bao MinYang	Student ID	20178013	
Sex	male	Duration of Schooling	4	
School	School of Computer and Communication Engineering	Admission Date	2017-09	
Major	Computer Science and Technology	Expected Graduation Date	2021-07	

No.	Course	Hours	Credits	Score	Semester
1	The C++ programming Language	72	4.5	89	2017-2018-1
2	The C++ programming Language	16	1.0	Good	2017-2018-1
3	Basic Training of Programming	32	2.0	Qualified	2017-2018-1
4	College English(I)	48	3.0	88	2017-2018-1
5	Advanced Mathematics B(1)	80	5.0	92	2017-2018-1
6	Introduction to Computer Science	32	2.0	81	2017-2018-1
7	Seminar on Computer	8	0.5	Qualified	2017-2018-1
8	Military Training	32	2.0	93	2017-2018-1
9	Moral Education and Foundation of law	40	2.5	89	2017-2018-1
10	Physical Education(1)	32	2.0	89	2017-2018-1
11	Linear Algebra B	40	2.5	78	2017-2018-1
12	Mental Health Education	16	1	83	2017-2018-1
13	CCPC/ICPC Contest training		2.0	Excellent	2017-2018-2
14	Java Programming	32	2.0	83	2017-2018-2
15	College Physics(Classical Electromagnetism)	32	2.0	91	2017-2018-2
16	College PhysicsMechanics	32	2.0	86	2017-2018-2
17	College English(II)	48	3.0	84	2017-2018-2
18	Advanced Mathematics B(II)	80	5.0	93	2017-2018-2
19	Discrete Mathematics	48	3.0	98	2017-2018-2
20	Basic Theory of Marxism	40	2.5	83	2017-2018-2
21	Social Practice of Ideological and Political Theory	32	2.0	95	2017-2018-2
22	Physical Education(2)	40	2.5	88	2017-2018-2
23	The thought on socialism with Chinese characteristics for a new era of xi jin ping	12	0.75	80	2017-2018-2
24	Modern Chinese History	32	2.0	91	2017-2018-2
25	To Love Snooker	24	1.5	Good	2018-2019-1
26	Training & Practice of Engineering Innovation	48	3.0	Qualified	2018-2019-1
27	College Physics(Wave and Optics)	24	1.5	81	2018-2019-1
28	College PhysicsModern Physics	16	1.0	93	2018-2019-1
29	Principles of Circuit	40	2.5	82	2018-2019-1
30	Probability And Statistics A	48	3.0	80	2018-2019-1
31	Theory of Numbered Musical Notation and Sightsinging Teaching(How to Recognize Numbered Musical Notation)	32	2.0	69	2018-2019-1
32	Introduction to Mao Zedong Thought and the Theoretical System ofSocialism with Chinese Characteristics	80	5.0	87	2018-2019-1
33	Data Structure	72	4.5	89	2018-2019-1
34	Data Structure Course Design	16	1.0	Excellent	2018-2019-1
35	Physical Education(3)	32	2.0	90	2018-2019-1
36	Introduction to Culture	32	2.0	73	2018-2019-1
37	Career and Development Planning	16	1.0	89	2018-2019-1
38	Basic useness of LaTex	8	0.5	Excellent	2018-2019-2
39	Basics of Creating Enterprise	32	2.0	Excellent	2018-2019-2
40	Basic Electronic Technology	72	4.5	71	2018-2019-2
41	Integrated Course Design for Electronic Circuit	16	1.0	Medium	2018-2019-2
42	Innovation and Engineering Practice	32	2.0	95	2018-2019-2
43	Assembly Language Programming	64	4.0	92	2018-2019-2
44	Military Theory	36	2.0	82	2018-2019-2
45	Artificial Intelligence	40	2.5	84	2018-2019-2

Academic Affairs of NEUQ

Date:2021-06-21

Academic Transcript of Northeastern University at Qinhuangdao

Name: Bao MinYang Student ID: 20178013 Class: 1705

No.	Course	Hours	Credits	Score	Semester
46	Principles of Database	64	4.0	92	2018-2019-2
47	Physical Education(4)	40	2.5	92	2018-2019-2
48	Physics Experiment(2)	16	2.5	84	2018-2019-2
49	Situation and Policy	32	2.0	Qualified	2018-2019-2
50	Introduction to Optimization	48	3.0	90	2018-2019-2
51	Compilation Principle	56	3.5	94	2019-2020-1
52	Operating System	64	4.0	94	2019-2020-1
53	Operating System Course Design	16	1.0	95	2019-2020-1
54	Computer Networks	56	3.5	82	2019-2020-1
55	Principles of Computer Organization	72	4.5	83	2019-2020-1
56	Computer Organization Course Design	32	2.0	Excellent	2019-2020-1
57	Algorithm Design and Analysis	40	2.5	83	2019-2020-1
58	Linux Operating System and Kernel Analysis	40	2.5	98	2019-2020-2
59	Web Application Development	48	3.0	95	2019-2020-2
60	Computer Interface Technology	40	2.5	88	2019-2020-2
61	Computer Architecture	32	2.0	96	2019-2020-2
62	Computer Networks Course Design	16	1.0	Excellent	2019-2020-2
63	Employment Guidance	16	1.0	97	2019-2020-2
64	Software Engineering	48	3.0	97	2019-2020-2
65	Information Security Infrastructure	40	2.5	94	2019-2020-2
66	Employment Practice	32	2.0	82	2020-2021-1
67	Sci-tech Document Writing	8	0.5	Qualified	2020-2021-1
68	Statistical Analysis of Data Science	24	1.5	80	2020-2021-1
69	Mobile Programming	40	2.5	87	2020-2021-1
70	Graduation Projectand Practice	192	12.0	Excellent	2020-2021-2
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Title of Graduation Design(Thesis):Design and Implementation of Simple 32-bit Operating System

Total Credits	176.3	Innovation Credits	11.0	GPA	3.8105

Note	1.Hundred mark system:(0-100) 2.Two points system:Qualified(80),Unqualified(0) 3.Five points system:Excellent(95),Good(85),Medium(75),Pass(65),Fail(0)

College Administrator(Signature/Seal)

Academic Affairs of NEUQ

Date:2021-06-21