

Pengjun Hou

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◆ Objective

Ph.D. in Computer Science, 25 Spring

◆ Education & Work Experience

SANGFOR Technology Company

08/2021 - Now

Software Development Engineer(T4) for Network Security Service

- **Duties:** Linux Backend Software Development of Dynamic Route, Management and Packet Forwarding of Network Interface, Hardware Abstraction Layer Adaption

Southeast University, Nanjing, China (Rank: 42/137)

09/2018-06/2021

Master of Science in Software Engineering, School of Computer Science and Engineering

- **Courses:** Artificial Intelligence, Machine Learning, Pattern Recognition, Algorithm Analysis and Design, Unified Modeling Language and Software Engineering, Database Design

Southeast University, Nanjing, China (GPA: 3.62/4.0 Rank: 5/50)

08/2014-06/2018

Bachelor of Information Management and Systems, School of Economics and Management

- **Honor:** 2017 Excellent Student in Southeast University
- **Courses:** Computer Network(91), Data Structure(88), Program and Algorithm Design(87), Operational Research(96), Macroeconomics(91), Microeconomics(92),

◆ Research Interests

Deep Learning, Reinforcement Learning, Natural Language Processing, Pattern Recognition

◆ Research Projects (Master Thesis & Bachelor's Capstone)

Health Measurement and Prediction of the Software Ecosystem in GITHUB

11/2020-05/2021

A health measurement method and prediction algorithm to monitor the health of open-source projects in software ecosystem (SECO) that can prevent losses for developers, companies and investors:

- Designed an evaluation index for assessing the health of the software ecosystem system, the index consisted of 13 indicators from three aspects: project roles, project activities and project outputs, such as the number of commit, the number of forker and so on.
- Adopted the principal component analysis (PCA) to evaluate the health status of SECO, and revealed dynamic changes in health by tracking the development of 617 Github software projects selected from Ghtorrent data set from 2012 to June 2018.
- Proposed a prediction algorithm, named GraphSage-LSTM, based on graph convolutional neural network and LSTM to forecast software ecosystem health fluctuations, which considered both the network topology and time series effects.

Pricing Model and Profit Analysis of Health Products in a Dual Channel Competitive Environment

11/2016-11/2017

A pricing model to maximize the merchant's profits in both online and offline channels:

- Implemented Python web crawler to collect extensive data on health products from Taobao and Jingdong, data of more than 3000 stores were crawled.
- Established a dual channel pricing model for health products based on market game theory models (Cournot model and Sturges model, taking into account key factors influencing pricing in both online and offline channels.

- Utilized mathematical partial derivation method to derive the solution for merchants to maximize profits when solving competition between online and offline channels. Meanwhile, we established a simulation system to verify effectiveness of the model.

◆ **Work Projects (SANGFOR Technology)**

Graceful Restart of Dynamic Routing OSPFv3 (Project in Sangfor company, RFC5187)

12/2021-03/2022

GR (Graceful Restart) is a mechanism that ensures uninterrupted forwarding services during master-slaver switchover or protocol restart. In OSPF GR, devices can notify surrounding devices when protocol restarts occur, maintaining neighbor relationships and stable routes for a certain period of time:

- Adopted the Zebra framework to implement the GR Restarter Restarting by restoring configuration and establishing connections between the ospf6d process and the networkd process.
- Maintained adjacency with the Restarter after receiving Grace-LSA from the Restarting device as GR Helper.
- Recomputed routes upon the neighbor establishment and LSA refresh with a binary prefix tree structure.
- Achieved uninterrupted system operation by avoiding routing oscillation during protocol restart and maintaining a stable packet forwarding route.

Optimization and Implementation of BiHash (Project in Sangfor company)

06/2022-08/2022

A high-performance hashing algorithm in the VPP open-source program that pre-allocates a substantial memory block to manage hash buckets, pages, and key-value pairs, reducing the need for frequent memory allocation or deallocation during hash element addition or removal:

- Reconstructed the memory data structure in the VPP algorithm, from one-time large-block memory allocation to multiple small-block allocations so that to save unnecessary memory space.
- Adopt the RCU mechanism delays the release of this memory to avoid the visit invalid null memory address to cause the abort of system, which significantly enhanced the stability and reliability of the OS program.
- Using free-lists chain to search for the corresponding page of memory firstly to avoid to allocate new memory. Placing the page address in the corresponding free-lists when release memory. The reuse of memory avoided frequent memory applications and improve system processing performance.

◆ **Honors & Awards**

2023 Runner up in the AI Eagle Cup competition at SANGFOR Technology Company

2019 Excellent Student Cadre at Southeast University

2017 Excellent Student at Southeast University

2017 National Inspirational Scholarship at Southeast University

2016 Third Prize of Jiangsu Province in the National College Student E-commerce Innovations Competition

2014,2015,2016 Southeast University Scholarship

◆ **SKILLS & QUALIFICATIONS**

Programming: Python, C & C++, Pytorch, MATLAB

Documentation: LaTeX, Microsoft Office (Word, Excel, PowerPoint), Github(<https://github.com/Hmarkey>)

Professional Software: Linux Operation System, DataBase Software(MySQL), GNS Software