

# Songshi Dou

M.S. Student in Control Engineering  
School of Automation  
Beijing Institute of Technology (BIT)  
Beijing 100081, China

songshidou@hotmail.com  
<https://songshidou.github.io>  
(+86) 187-0131-1355

## Summary / Statement

Songshi Dou's research focuses on computer networks, including Software-Defined Networking (SDN), Network Function Virtualization (NFV), Data Center Network (DCN), and Content Delivery Network (CDN). He has published 6 journal/conference papers and owned/applied 5 Chinese patents.

## Education

<b>Beijing Institute of Technology (BIT)</b> , Beijing, China	2019 - 2022 (expc.)
M.S. Student in Control Engineering	
Advisor: Prof. Zehua Guo	
<b>North China Electric Power University (NCEPU)</b> , Beijing, China	2015 - 2019
B.S. in Automation, July 2019	

## Publications

### Journal Papers

- [J1] Zehua Guo, **Songshi Dou**, Sen Liu, Wendi Feng, Wenchao Jiang, Yang Xu, and Zhi-Li Zhang, "Maintaining Control Resiliency and Flow Programmability in Software-Defined WANs During Controller Failures", *IEEE/ACM Transactions on Networking (TON)*, Accepted.
- [J2] Zehua Guo, **Songshi Dou**, Yi Wang, Sen Liu, Wendi Feng, and Yang Xu, "HybridFlow: Achieving Load Balancing in Software-Defined WANs with Scalable Routing", *IEEE Transactions on Communications (TCOM)*, vol. 69, no. 8, pp. 5255-5268, Aug. 2021.
- [J3] **Songshi Dou**, Guochun Miao, Zehua Guo, Chao Yao, Weiran Wu, and Yuanqing Xia, "Matchmaker: Maintaining Network Programmability for Software-Defined WANs under Multiple Controller Failures", *Elsevier Computer Networks (COMNET)*, vol. 192, p. 108045, 2021.

### Conference Papers

- [C1] **Songshi Dou**, Zehua Guo, and Yuanqing Xia, "ProgrammabilityMedic: Predictable Path Programmability Recovery under Multiple Controller Failures in SD-WANs", *IEEE International Conference on Distributed Computing Systems 2021 (ICDCS'21)*. (Accept Ratio: 97/489=19.8%)

- [C2] Yijun Sun, Zehua Guo, **Songshi Dou**, and Yuanqing Xia, “Video Quality and Popularity-aware Video Caching in Content Delivery Networks”, *IEEE International Conference on Web Services 2021 (ICWS’21)*.
- [C3] Zehua Guo, **Songshi Dou**, and Wenchao Jiang, “Improving the Path Programmability for Software-Defined WANs under Multiple Controller Failures”, *IEEE/ACM International Symposium on Quality of Service 2020 (IWQoS’20)*.

## Posters & Demos

- [D1] Yijun Sun, Zehua Guo, **Songshi Dou**, Junjie Zhang, Changlin Li, and Xiang Ouyang, “Poster: Enabling Fast Forwarding in Hybrid Software-Defined Networks”, *IEEE International Conference on Network Protocols 2021 Poster (ICNP’21)*.

## Manuscripts

- [M1] Zehua Guo, **Songshi Dou**, and Wenchao Jiang, “Towards Improved Path Programmability Recovery for Software-Defined WANs under Multiple Controller Failures”, *IEEE/ACM Transactions on Networking (TON)*, Major Revision.
- [M2] Zehua Guo, **Songshi Dou**, and Wenfei Wu, “Towards Flexible and Predictable Path Programmability Recovery under Multiple Controller Failures in Software-Defined WANs”, *IEEE/ACM Transactions on Networking (TON)*, Major Revision.
- [M3] Haoran Ni, Zehua Guo, Changlin Li, **Songshi Dou**, Chao Yao, and Thar Baker, “Network Coding-based Resilient Routing for Maintaining Data Security and Availability in Software-Defined Networks”, *Elsevier Journal of Network and Computer Applications (JNCA)*, Minor Revision.
- [M4] **Songshi Dou**, Zehua Guo, Yongchao He, Sen Liu, and Wenfei Wu, “RateSheriff: Multipath Flow-aware and Resource Efficient Rate Limiter Placement for Programmable Data Center Networks”, *IEEE International Conference on Distributed Computing Systems 2022 (ICDCS’22)*, Under Review.
- [M5] **Songshi Dou**<sup>†</sup>, Li Qi<sup>†</sup>, Zehua Guo, and Chao Yao, “Exploring the Impact of Critical Programmability on Controller Placement for Software-Defined Wide Area Networks”, *Elsevier Journal of Network and Computer Applications (JNCA)*, Under Review. (<sup>†</sup> Co-first authors)
- [M6] Zehua Guo, Changlin Li, **Songshi Dou**, Tengpeng Zhu, and Yi Cai, “Maintaining Performance of Software-Defined WANs with Efficient Critical Routing”, *Elsevier Journal of Network and Computer Applications (JNCA)*, Under Review.
- [M7] Yuntian Zhang, Ning Han, Zehua Guo, Junjie Zhang, Tengpeng Zhu, Minghao Ye, and **Songshi Dou**, “Prophet: Traffic Engineering-centric Traffic Matrix Prediction”, *IEEE/ACM International Symposium on Quality of Service 2022 (IWQoS’22)*, Under Review.

## Patents

- [P1] Zehua Guo, and **Songshi Dou**, “Optimizing Flow Programmability under Multiple Controller Failures in Software-Defined Networks”, Chinese Patent, ZL202010544094.4.
- [P2] Zehua Guo, Penghao Sun, **Songshi Dou**, Yutian Zhang, Ning Han, and Yuanqing Xia, “Deep Reinforcement Learning-based Data Center Network Energy Management and Quality of Service Optimization Method”, Chinese Patent, ZL202010308862.6.

- [P3] Zehua Guo, Penghao Sun, **Songshi Dou**, Yuanqing Xia, and Honghai Ji, “A Load Balancing Method for Multi-Controller in Software-Defined Networking”, Chinese Patent, ZL202010094237.6.
- [P4] Zehua Guo, **Songshi Dou**, and Yuanqing Xia “A Scalable Routing Method for Realizing Load Balancing in Software-Defined Wide Area Networks”, Chinese Patent, Application Number: 202010974299.6.
- [P5] Zehua Guo, Yutian Zhang, Ning Han, and **Songshi Dou**, “A Traffic Engineering-centric Traffic Matrix Prediction Method”, Chinese Patent, Application Number: 202110810615.0.

## Honors & Awards

- National Scholarship Award (Top 1%), Chinese Ministry of Education 2021
- Outstanding Master Student Model (Top 1%), Beijing Institute of Technology 2021
- Outstanding Master Student Scholarship Award, Beijing Institute of Technology 2021
- ICNP 2021 Student Registration Award, IEEE Computer Society TCDP 2021
- OSDI 2021 Student Grant, USENIX 2021
- ICDCS 2021 Student Registration Award, IEEE Computer Society TCDP 2021
- CNCC 2020 Student Registration Award, China Computer Federation (CCF) 2020
- Third Prize of China Post-Graduate Mathematical Contest in Modeling, China 2020
- First-class Master Student Scholarship Award, Beijing Institute of Technology 2020
- Bachelor Student Scholarship Award, North China Electric Power University 2015, 2016, 2017

## Talks & Presentations

- “ProgrammabilityMedic: Predictable Path Programmability Recovery under Multiple Controller Failures in SD-WANs”, *IEEE International Conference on Distributed Computing Systems 2021 (ICDCS’21)*, Online, July 2021.
- “Improving the Path Programmability for Software-Defined WANs under Multiple Controller Failures”, *IEEE/ACM International Symposium on Quality of Service 2020 (IWQoS’20)*, Online, June 2020.

## Language

- Native Chinese (Mandarin)
- Fluent English