

BANGWEN DENG

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EDUCATION

Tsinghua University, Beijing, China

September 2018 - Present

- Master of Computer Science (Third year, purchasing)

Nankai University, Tianjin, China

September 2014 - June 2018

- Bachelor of Computer Science.

SKILLS & INTERESTS

SDN & NFV: OpenNetVM, OpenNF, DPDK

Compiler Techniques: LLVM framework, Symbolic Execution, GCC, Clang

Distributed System: Raft, BytePS

Programming Language: C, C++, Python, Java, Go

RESEARCH PROJECTS

NFReducer-related Work

- **Descriptions:** We identify a set of runtime redundant logic in NFs, and propose to use runtime configurations to eliminate them. We implement the system named NFReducer using LLVM and use program analysis techniques such as program slicing, constant propagation, and dead code elimination to make the redundancy elimination optimization.

- **Status:** Papers accepted by IEEE INFOCOM 2021 & ACM SOSR 2020.

NF-SE: Symbolic Execution for Network Functions with Time-Driven Logic

- **Descriptions:** We propose that NF modeling language should include time-driven logic to perform complete verification and avoid false positive/negative results. In this project, we define primitives to express time-driven logic in NF modeling language and further develop a symbolic execution engine NF-SE to verify such logic for multiple packets.

- **Status:** Paper accepted by IEEE MASCOTS 2020.

NFD: Using Behavior Models to Develop Cross-Platform NFs

- **Descriptions:** We designed a table-form model to describe a variety of NF programs and proposed NFD compiler that takes NF models as input to automatically generate NFs runnable executables integrated with the features of multiple target platforms such as OpenNF and Intel SGX.

- **Status:** Paper accepted by IEEE INFOCOM 2021.

INTERNSHIP EXPERIENCE

Tencent, Beijing, China

November 2019 - July 2020

- As a Data Engineer working on the project of large-scale optical modules failure prediction.

- **Job Description:** By collecting the property data of optical modules cases, on the one hand, we compare the difference in variance and stationarity between the failed and normal modules. On the other hand, we extract the features from the time series data, construct feature vectors, and design an efficient machine learning model to classify the failed and normal optical modules.

PUBLICATIONS

[1] **Bangwen Deng**, and Wenfei Wu. NFOpt: Eliminating Redundant Logic in NF Programs using Operation-Time Configurations. In Proc. 40th Annual IEEE International Conference on Computer Communications (INFOCOM 2021), 2021.

[2] Hongyi Huang, Yongchao He, **Bangwen Deng**, Wenfei Wu, Ying Zhang, Yongqiang Xiong, Guo Chen, Yong Cui, and Peng Cheng. In Proc. 40th Annual IEEE International Conference on Computer

Communications (INFOCOM 2021), 2021.

[3] **Deng, B.**, and Wu, W., Song L. NFReducer: Redundant Logic Elimination in Network Functions. In Proceedings of the Symposium on SDN Research. ACM, 2020.

[4] Harsha S, Wenfei W, **Bangwen D.** NF-SE: Symbolic Execution for Network Functions with Time-Driven Logic. In 2020 IEEE 28th International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2020).