Jingxuan (Jensen) Zhang

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Research Interests

Network and application integration
Software-defined networking
Machine learning in networks

Project Experience

OpenDaylight ALTO

Project Contact, 2015 - present

- Official open source implementation of the Application-Layer Traffic Optimization (ALTO) protocol.
- Designed and Implemented the main building blocks of ALTO in OpenDaylight.
- Manage the project in the OpenDaylight community and review the code.
- Created OpenALTO community (https://github.com/openalto/).

Unicorn: Unified Resource Orchestration for Multi-Domain, Geo-Distributed Data Analytics

Architect and Contact, August - November 2017

- The first multi-domain, multi-controller orchestration system for scientific data analytics.
- Coordinated with the collaborators from CERN, Caltech and Starlight to deploy the system in Caltech HEP Data Center.
- Demonstrated in SuperComputing 2017, 2018, and 2019.
- Source opened at https://github.com/openalto/mercator-setup.

Devopen: SDN IDE

Project Lead, 2016 - 2017

- The first IDE supporting visual programming for Software-Defined Networking.
- Integrated the complete SDN lifecycle of Dev, Op and Use.
- Gave the tutorial and demonstration in OpenDaylight Summit 2016 and SuperComputing 2016.
- Source opened at https://github.com/snlab/Devopen.

SeL4-based HD-ElastOS (Kortide, Shanghai)

Intern, Octobor 2014 - April 2015

- A Component Assembly Runtime (CAR) embedded operating system on top of state-of-the-art micro kernel.
- Ported micro-kernel seL4 to some specific hardware platforms (pandanboard, lamobo M1, etc.).
- Ported ElastOS on top of seL4.

Education

Yale University

Visiting Assistant in Research (Computer Science), 2018.11 - 2020.10

Tongji University

Ph.D. Student (Computer Science), 2017.03 - now

Master Student (Computer Science), 2015.09 - 2017.03

B.Sc. (Computer Science), 2013.03 - 2015.07

Undergraduate Student (Minor in Mathematics), 2011.09 - 2013.01

Awards

Participant Award of ACM Student Research Competition (2020).

China Scholarship Council Support (2018).

Outstanding Graduate of Tongji University (2015).

Second prize in Chinese National Undergraduate Electronic Design Contest (2014).

Honor Mention prize in ICM/MCM (2014).

First prize in Chinese National Undergraduate Mathematics Competition (2012).

Internet Standards

1. Content Delivery Network Interconnection (CDNI) Request Routing: CDNI Footprint and Capabilities Advertisement using ALTO. IETF ALTO WG. (Approved by IESG; Ready to be published as an RFC)
2. ALTO Extension: Path Vector. IETF ALTO WG. (Approved by IESG; Ready to be published as an RFC)
3. ALTO Extension: Entity Property Maps. IETF ALTO WG. (Approved by IESG; Ready to be published as an RFC)
4. A Yang Data Model for OAM and Management of ALTO Protocol. IETF ALTO WG. (Ready to be adopted as a WG draft)

Publications

1. **Zhang, J.**, 2021. IntQOE: Integrated End-to-end QoE Optimization for Edge Computing Enabled Web Application. In Proceedings of the ACM SIGCOMM 2021 Workshop on Network-Application Integration (NAI), ACM.

2. **Zhang, J.**, Contreras, L., Gao, K., Cano, F. , Cano, P., Escribano, A. and Yang, Y. R., 2021. Sextant: Enabling Automated Network-aware Application Optimization in Carrier Networks. In Proceedings of the International Symposium on Integrated Network Management (IM), IFIP/IEEE.

3. Cheng Y., Luo N., **Zhang, J.**, Antonopoulos T., Piskac R., Xiang Q., 2021. Looking for the Maximum Independent Set: A New Perspective on the Stable Path Problem. In Proceedings of the *40th IEEE International Conference on Computer Communications (INFOCOM)*, IEEE.

4. **Zhang, J.**, Yang, Y.R., 2020. COC: Hierarchical Coflow Ordering for WAN Bandwidth Optimization in Inter-Data Center. In Proceedings of the *Annual conference of the ACM Special Interest Group on Data Communication on the applications, technologies, architectures, and protocols for computer communication (SIGCOMM)*, ACM.

5. **Zhang, J.**, Gao, K., Yang, Y.R. and Bi, J., 2020. Prophet: Toward Fast, Error-Tolerant Model-Based Throughput Prediction for Reactive Flows in DC Networks. In *Transactions on Networking (TON)*, IEEE/ACM.

6. Xiang, Q., **Zhang, J.**, Gao, K., Lim, Y.S., Le, F., Li, G. and Yang, Y.R., 2020, July. Toward Optimal Software-Defined Interdomain Routing. In Proceedings of the *39th IEEE International Conference on Computer Communications (INFOCOM)*, IEEE, 1529-1538.

7. Xiang, Q., Wang, X., **Zhang, J.**, Newman, H., Yang, Y.R. and Liu, J., 2019. Unicorn: Unified Resource Orchestration for Multi-Domain, Geo-Distributed Data Analytics. In *Future Generation Computer Systems*, Elsevier.

8. Xiang, Q., **Zhang, J.**, Wang, X., Liu, J., Guok, C., Le, F., MacAuley, J., Newman, H. and Yang, Y.R., 2018. Fine-Grained, Multi-Domain Network Resource Abstraction as a Fundamental Primitive to Enable High-Performance, Collaborative Data Sciences. In Proceedings of the *International Conference for High Performance Computing, Networking, Storage and Analysis (SC)*, ACM.

9. Gao, K., **Zhang, J.**, Yang, Y.R. and Bi, J. 2018., Prophet: Fast Accurate Model-based Throughput Prediction for Reactive Flow in DC Networks. In Proceedings of the *37th IEEE International Conference on Computer Communications (INFOCOM)*, IEEE, 720-728.

10. Wang, W., **Zhang, J.**, Guo, D., Xiang, Q., Huang, C., Chang, J. and Zhang, L. 2016. Towards an emerging cloudware paradigm for transparent computing. In Proceedings of the *9th IEEE/ACM International Conference on Utility and Cloud Computing (UCC)*, IEEE, 43-48.

Programming Skills

Very experienced with development in YANG and OpenDaylight.

Very experienced with Python and Mininet.

Familiar with Docker and Kubernetes.

Familiar with full-stack web development.

Familiar with embedded programming.

Biography

Jingxuan Zhang is a PhD candidate in the Department of Computer Science at Tongji University, advised by Prof. Y. Richard Yang. He was also a CSC (China Scholarship Council) sponsored visiting researcher at Yale univerisity from 2018 to 2020. His doctoral research focuses on network resource discovery, abstraction and programming consistency for large-scale data analytics systems. He is also an active member of IETF ALTO WG and OpenDaylight open source community.

Details for me, visit my homepage: https://jensen-zhang.site/