

Victor Yu Liu, Ph.D. +1-408-768-8806, victor.liu@umich.edu, [linkedin.com/in/liuyu](https://www.linkedin.com/in/liuyu)

Work Experience

- 2022 – present: **U. of Michigan**, Ann Arbor, MI **Research Professor**
- Build self-operating networks by creating meaningful dataset to train machine learning models
 - Teach courses on Logic Design, Computational Social Sciences, & Performance Analysis
 - Research on cloud networking and container networking interfaces, i.e. Cilium and eBPF
- 2019 – Nov. 2023: **ViaSat**, San Jose, CA & Ann Arbor, MI **SDN Architect, Acting Manager**
- Close-loop network deployment and verification using Intent-based networking tools
 - Root-cause analysis via automated dependency tracking and causal inference
 - Build network automation software in micro-service architecture on kubernetes clusters
- 2015 – 2019: **Visa**, Foster City, CA **Chief Network Architect**
- Automate network verification for change management using Intent Based Networking tools
 - Network change drift analysis and config generation from golden template
 - Network tools rationalization - moving FCAPS features to micro-services
 - Long term architectural evolution of backbone of the global financial network
 - SD-WAN vendor evaluation and selection for equipment refresh on the access networks
- 2012 – 2015: **Huawei**, Santa Clara, CA **Principal Architect**
- 2010 – 2011: Boston, MA **Research Consultant**
- Created a multi-year program on IP/optical network management & OSS
 - Recruited multiple software architects and built a global OSS software team of 60
 - Led corporate-wide strategies, standards and implementations in the SDN core team
 - Advised network planning & optimization research, doubled team to 30+ due to RoI
 - Led algorithm research for IP & optical network planning solutions, innovated on areas in routing wavelength assignment optimization, ROADMS and regenerator modeling and placement, impairment-aware planning, packet and optical multi-layer network protection, mobile backhaul capacity budgeting and TCO comparison between OTN and MPLS, shared mesh path protection against dual failures, min-max fairness Traffic Engineering (TE) for DC Interconnects, traffic and network data analytics
- 2007 – 2009: **Juniper**, Sunnyvale, CA **Staff Engineer**
- Led software development of packet forwarding engine (PFE) on backbone T/TX routers
 - Worked on the control and data plane interfaces, QoS/CoS, multicast and load balancing
- 2001 – 2007: **OPNET**, Santa Clara, CA & Cary, NC **Senior Software Engineer**
- Owned various IP/MPLS automated network design features and optimization solutions, i.e., IP network capacity planning, offline MPLS TE, topology design, fast reroute deployment, DiffServ-TE, and backbone CapEx optimization
 - Owned graph models, routing & network flow algorithms, in C++
 - Implemented more than half of design solutions for NP-Hard problems in ServiceProvider Guru product, which was OEMed by Cisco as the Network Planning Solution in 2005-08
 - Worked with the strategic planning teams of top-tier carriers on network innovations
 - OPNET was acquired by Riverbed in 2011 for \$1B for its APM & NPM capabilities.

Education

2001: Ph.D., University of Pittsburgh, in Information Science & Telecommunications
1996: M.E., Tsinghua University, in Communication & Electronic Systems
1993: B.E., Xi'an Jiaotong University, in Information Science & Technology

Selected Publications, Patents and Presentations

- [1] Apparatus for Detection and Correction of Network Problems with Machine Learning, *Victor Liu, et. al.*, US Patent Application, Nov., 2022
- [2] [Protection against dual failures for resilient two layer networks](#), *Victor Liu, Yufei Wang*, US Patent 9,973,377, 2018
- [3] [Shared backup path protection for dual link failures using successive survivable routing](#), *Victor Yu Liu*, US Patent 9,143,398, 2015
- [4] [Apparatus and method to find partially disjoint routes for dual fiber-cuts](#), *Victor Y Liu, Zhicheng Sui*, US Patent 9,007,892, 2015
- [5] [Apparatus and method for spare capacity allocation on dual link failures](#), *Victor Y Liu*, US Patent 9,001,648, 2015
- [6] [Finding partially disjoint paths in shared backup path protection for dual fiber cuts](#), *Victor Y Liu*, US Patent 8,995,827, 2015
- [7] [Protection Coordination for Dual Failure on Two-Layer Networks](#), *Victor Liu*, Design of Reliable Communications Network (DRCN), 2015
- [8] [Dual Failure Resiliency on Single Failure Protected Packet Optical Integrated Networks](#), *Zhicheng Sui, Victor Liu*, DRCN, 2015
- [9] [Stitching Layers and Domains for Enhanced Service Reliability](#), *Victor Liu*, MPLS SDN World Congress, Paris, France, 2015
- [10] [Capacity Budgeting for Packet Optical Integration](#), *Victor Liu*, IP+Optical Network iPOP2014, Tokyo, Japan, 2014
- [11] [Design and Optimization of Packet Optical Integration](#), *Victor Liu*, MPLS SDN World Congress, Paris, France, 2014
- [12] [Spare Capacity Allocation using Shared Backup Path Protection with Partially Disjoint Paths](#), *Victor Yu Liu, David Tipper*, DRCN, Budapest, 2013
- [13] [Spare capacity allocation using Shared Backup Path Protection for Dual Link Failures](#), *Victor Yu Liu, David Tipper*, Computer Communications, Vol. 36, No. 6., 2013
- [14] [Finding Partially Disjoint Routes for Dual Fiber-Cut Protection on Bi-Connected Networks](#), *Victor Yu Liu, Zhicheng Sui*, Optical Fiber Conference (OFC), 2012
- [15] [Traffic Grooming in WDM Mesh Networks with Loop-Free Paths](#), *Kwok Shing Ho, Victor Yu Liu*, OFC, 2012
- [16] Internet Backbone Evolution and Innovations, *Victor Yu Liu*, keynote at Huawei's First IP/Optical Summit, Xi'An, China, 2011
- [17] [Spare capacity allocation in two-layer networks](#), *Yu Liu, David Tipper, Korn Vajanapoom*, IEEE J. S. A. on Communications, 2007

- [18] [Approximating optimal spare capacity allocation by successive survivable routing](#),
Yu Liu, David Tipper, Peerapon Siripongwutikorn, IEEE/ACM Trans. Networking, 2005
- [19] [Apparatus and method for spare capacity allocation](#),
Yu Liu, David Tipper, US Patent 6,744,727 B2, 2001
- [20] [A Tandem Queue Model for Two-Server Resequencing System](#),
Yu Liu, Zhisheng Niu, Xiaokang Lin, Jianhua Lu, Technical Report, Tsinghua University, 1996