

# Oliver Michel

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## Education

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<b>University of Colorado Boulder</b> , Boulder, CO, USA Ph.D., Computer Science Thesis: Cloud-Scale Packet-Level Network Telemetry and Analytics Advisor: Prof. Eric Keller	Aug. 2015 – May 2019
<b>University of Colorado Boulder</b> , Boulder, CO, USA M.S., Computer Science	Aug. 2013 – May 2015
<b>University of Vienna</b> , Vienna, Austria B.S., Computer Science	Feb. 2009 – Jun. 2013

## Experience

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<b>Princeton University</b> , Princeton, NJ, USA Associate Research Scholar Advisor: Prof. Jennifer Rexford	since Sep. 2023
<b>Princeton University</b> , Princeton, NJ, USA Postdoctoral Research Associate Advisor: Prof. Jennifer Rexford	Sep. 2021 – Aug. 2023
<b>University of Vienna</b> , Vienna, Austria Postdoctoral Research Associate Advisor: Prof. Stefan Schmid	Apr. 2020 – Jul. 2021
<b>TourRadar GmbH</b> , Vienna, Austria Software Engineer	Aug. 2019 – Feb. 2020
<b>Juniper Networks</b> , OpenLab, Bridgewater, NJ, USA WAN Automation Software Engineering Intern	Summer 2016
<b>University of Illinois at Urbana-Champaign</b> , Urbana, IL, USA Research Intern, Dept. of Computer Science Advisor: Prof. Brighten Godfrey	Winter 2011 & Summer 2012

## Publications

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*Bibliometrics:* 17 peer-reviewed publications, 1044 citations, 757 since 2020, h-index: 11, i10-index: 12

## Preprints

- Oliver Michel, Satadal Sengupta, Hyojoon Kim, Ravi Netravali, Jennifer Rexford. Scalable Video Conferencing Using SDN Principles. <https://arxiv.org/abs/2503.11649>

## Conferences

- [1] Marcelo Abranches, Erika Hunhoff, Rohan Eswara, Oliver Michel, Eric Keller. LinuxFP: Transparently Accelerating Linux Networking. IEEE International Conference on Distributed Computing Systems (ICDCS), Jersey City, NJ, USA, 2024 — **Won Distinguished Paper Award**

- [2] [Oliver Michel](#), Satadal Sengupta, Hyojoon Kim, Ravi Netravali, Jennifer Rexford. Enabling Passive Measurement of Zoom Performance in Production Networks. ACM Internet Measurement Conference (IMC), Nice, France, 2022
- [3] Vamsi Addanki, [Oliver Michel](#), Stefan Schmid. PowerTCP: Pushing the Performance Limits of Data-center Networks. USENIX Symposium on Networked System Design and Implementation (NSDI), Renton, WA, USA, 2022
- [4] Marcelo Abranches, [Oliver Michel](#), Eric Keller, Stefan Schmid. Efficient Network Monitoring Applications in the Kernel with eBPF and XDP. IEEE Conference on Network Function Virtualization and Software-Defined Networking (NFV-SDN), Heraklion, Greece, 2021 — **Won Best-Paper Award**
- [5] [Oliver Michel](#), Eric Keller, Fernando M.V. Ramos. Network Defragmentation in Virtualized Data Centers. 6th IEEE International Conference on Software Defined Systems (SDS), Rome, Italy, 2019
- [6] John Sonchack, [Oliver Michel](#), Adam J. Aviv, Eric Keller, Jonathan M. Smith. Scaling Hardware Accelerated Monitoring to Concurrent and Dynamic Queries With \*Flow. USENIX Annual Technical Conference (ATC), Boston, MA, USA, 2018
- [7] [Oliver Michel](#), Eric Keller. SDN in Wide-Area Networks: A Survey. 4th IEEE International Conference on Software Defined Systems (SDS), Valencia, Spain, 2017
- [8] [Oliver Michel](#), Eric Keller. Policy Routing using Process-Level Identifiers. 3rd IEEE Intl. Symposium on Software Defined Systems (SDS), Berlin, Germany, 2016

## Workshops

- [9] Fan Yi, Haoran Wan, Kyle Jamieson, Jennifer Rexford, Yaxiong Xie, [Oliver Michel](#). Athena: Seeing and Mitigating Wireless Impact on Video Conferencing and Beyond. ACM Workshop on Hot Topics in Networks (HotNets), Irvine, CA, USA, 2024
- [10] Marcelo Abranches, [Oliver Michel](#), Eric Keller. Getting back what was lost in the Era of High-Speed Software Packet Processing. ACM Workshop on Hot Topics in Networks (HotNets), Austin, TX, USA, 2022
- [11] [Oliver Michel](#), John Sonchack, Eric Keller, Jonathan M. Smith. PIQ: Persistent Interactive Queries for Network Analytics. ACM International Workshop on Security in Software Defined Networks & Network Function Virtualization (SDN-NFV Sec.), Dallas, TX, USA, 2019
- [12] [Oliver Michel](#), John Sonchack, Eric Keller, Jonathan M. Smith. Packet-Level Analytics in Software without Compromises. 10th USENIX Workshop on Hot Topics in Cloud Computing (HotCloud), Boston, MA, USA, 2018
- [13] Greg Cusack, [Oliver Michel](#), Eric Keller. Machine Learning-Based Detection of Ransomware using SDN. ACM International Workshop on Security in Software Defined Networks & Network Function Virtualization (SDN-NFV Sec.), Tempe, AZ, USA, 2018
- [14] Matthew Monaco, [Oliver Michel](#), Eric Keller. Applying Operating System Principles to SDN Controller Design. 12th ACM Workshop on Hot Topics in Networks (HotNets), College Park, MD, USA, 2013
- [15] Ashish Vulimiri, [Oliver Michel](#), P. Brighten Godfrey, Scott Shenker. More is Less: Reducing Latency via Redundancy. ACM Workshop on Hot Topics in Networks (HotNets), Redmond, WA, USA, 2012

## Journals

- [16] [Oliver Michel](#), Roberto Bifulco, Gábor Rétvári, Stefan Schmid. The Programmable Data Plane: Abstractions, Architectures, Algorithms, and Applications. ACM Computing Surveys (CSUR), Vol. 54, Issue 4, July 2021
- [17] [Oliver Michel](#), John Sonchack, Greg Cusack, Maziyar Nazari, Eric Keller, Jonathan M. Smith. Software Packet-Level Network Analytics at Cloud Scale. IEEE Transactions on Network and Service Management (TNSM), Vol. 18, Issue 1, Mar. 2021

## Talks

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### Accelerating Linux Networking using eBPF

- TU Berlin, Germany, Jun. 2024

### Cross-Layer and 5G-Aware Measurement of Interactive Multimedia Applications

- Center for Applied Internet Data Analysis (CAIDA), San Diego, CA, USA, Feb. 2025
- Princeton University NextG Symposium, Princeton, NJ, May 2024

### Enabling Passive Measurement of Zoom Performance in Production Networks

- Columbia University, New York, Feb. 2023
- North American Network Operators Group (NANOG) General Meeting 87, Atlanta, GA, Feb. 2023
- University of Chicago, Oct. 2022

### Cloud-Scale Packet-Level Network Telemetry and Analytics

- University of Vienna, April 2019
- North American Network Operators Group (NANOG) General Meeting 73, Denver, CO, June 2018

### Network Defragmentation in Virtualized Data Centers

- University of Lisbon, September 2017

### Applying Operating System Principles to SDN Controller Design

- University of Illinois at Urbana-Champaign, April 2014

### More is Less: Reducing Latency via Redundancy

- University of Colorado Boulder, April 2013

## Posters

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- [1] Fan Yi, Oliver Michel, Haoran Wan, Kyle Jamieson. Understanding the Impact of Cellular RAN-induced Delay on Video Conferencing. 30th Annual International Conference On Mobile Computing And Networking (Mobicom), Washington, DC, USA, 2024
- [2] Oliver Michel, Satadal Sengupta, Hyojoon Kim, Ravi Netravali, Jennifer Rexford. Passive Measurement of Real-Time Video Applications. Project Pronto Demo Day, Stanford, CA, USA, 2023
- [3] Oliver Michel, John Sonchack, Adam J. Aviv, Eric Keller. Scalable, Hardware-Accelerated Network Analytics. 15th USENIX Symposium on Networked System Design and Implementation (NSDI), Renton, WA, USA, 2018
- [4] Greg Cusack, Oliver Michel, Eric Keller. Machine Learning-Based Fingerprinting of Network Traffic using Programmable Forwarding Engines. NDSS Security Symposium 2018, San Diego, CA, USA, 2018 — **Won Best-Poster Award**
- [5] Oliver Michel, Eric Keller. Defragmenting the Cloud. 13th USENIX Symposium on Networked System Design and Implementation (NSDI), Santa Clara, CA, USA, 2016
- [6] Oliver Michel, Michael Coughlin, Eric Keller. Extending the Software-Defined Network Boundary. ACM SIGCOMM 2014 Conference, Chicago, IL, USA, 2014
- [7] Michael Coughlin, Oliver Michel, Eric Keller. Making the Live Network the Honeypot. 11th USENIX Symposium on Networked System Design and Implementation (NSDI), Seattle, WA, USA, 2014
- [8] Oliver Michel, Matthew Monaco, Eric Keller. Applying Operating System Principles to SDN Controller Design. 18th GENI Engineering Conference, New York, NY, USA, 2013
- [9] Oliver Michel, David Stezenbach, Kurt Tutschku. Multihoming and Adaptive Multipath Transmission using off-the-shelf Components in Preclinical Medical Care. 10th USENIX Symposium on Networked System Design and Implementation (NSDI), Chicago, IL, USA, 2013
- [10] Oliver Michel, Ashish Vulimiri, P. Brighten Godfrey. Adaptive Source Routing. 12th GENI Engineering Conference, Los Angeles, CA, USA, 2012

## Teaching Experience

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### **Guest Lecturer, COS597S Recent Advances in Wireless Networks**

Princeton University, Prof. Kyle Jamieson, Fall 2024

### **Guest Lecturer, ECE539B Security and Performance Challenges in Networked Systems**

Princeton University, Prof. Maria Apostolaki, Fall 2022

### **Lecturer, Network Security** (Undergraduate and Graduate)

University of Vienna, Spring 2021

### **Lecturer, Operating Systems** (Undergraduate)

University of Vienna, Spring 2021

### **Lecturer, Network Technologies** (Undergraduate)

University of Vienna, Fall 2020

### **Guest Lecturer, ECEN5008 Advanced Computer and Networked System Security**

University of Colorado Boulder, Prof. Eric Keller, Fall 2017

### **Guest Lecturer, ECEN5013, Advanced Computer Networks**

University of Colorado Boulder, Prof. Eric Keller, Fall 2013, Fall 2015, Fall 2016

### **Teaching Assistant, CSCI2400 Computer Systems**

University of Colorado Boulder, Prof. Richard Han, Fall 2013

### **Staff Tutor, Network Technologies**

University of Vienna, Spring 2011, Prof. Kurt Tutschku, Spring 2012

## Awards and Fellowships

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- Distinguished Paper Award, IEEE ICDCS 2024
- Best Paper Award, IEEE NFV-SDN 2021
- Best Technical Poster Award, NDSS 2018
- Dean's Outstanding Merit Fellowship, University of Colorado Boulder, 2013
- Joint Study Scholarship, University of Vienna, Austria, 2011

## Service

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### **Program Committee**

- ACM Eurosys Posters & Demos, 2025
- ACM eBPF Workshop (co-located with SIGCOMM), 2024
- ACM Internet Measurement Conference (IMC), 2024, 2025
- IEEE/IFIP Network Traffic Measurement and Analysis Conference (TMA), 2024
- IEEE Conference on Local Computer Networks (LCN), 2023
- ACM SIGCOMM Posters & Demos, 2022
- ACM/IEEE Symp. on Architectures for Networking and Communication Systems (ANCS), 2021
- ACM Workshop on Systems and Network Telemetry and Applications (SNTA), 2021, 2022
- IEEE Conference on Network Function Virtualization and Software-defined Networks (NFV-SDN), 2021, 2022

### **Reviewer**

- Elsevier Computer Networks Journal, 2022
- IEEE Internet of Things Journal, 2022, 2023
- IEEE/ACM Transactions on Networking (ToN), 2021, 2023, 2025
- IEEE Transactions on Network and Service Management (TNSM), 2019, 2020, 2021

### Organization Committee

- IEEE Conference on Network Function Virtualization and Software-defined Networks (NFV-SDN), 2021

### External Reviewer

- USENIX Symposium on Networked System Design and Implementation (NSDI), 2023
- IEEE Conference on Computer Communications (INFOCOM), 2021

### References

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#### **Jennifer Rexford**

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#### **Eric Keller**

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