

# Thomas Holterbach

Postdoctoral researcher at the University of Strasbourg



✉ thomasholterbach@gmail.com

French, 31 years old

## Research Interests

- Internet routing, architecture and security
- Network traffic measurements and analysis
- Software-defined networking
- Programmable network hardware
- Artificial intelligence for networking
- Algorithm design and optimisation

## Education

**Doctoral degree in Computer Science**, ETH Zürich, Switzerland Aug. 2021

Advised by Prof. Laurent Vanbever in the Networked Systems Group

- Passed the Machine Learning (8 credits) & Data Mining (4 credits) courses

**Master degree in Computer Science**, University of Strasbourg, France June 2014

Specialized in Networks and Embedded systems

With honors. Ranked 2'/15. Grade: 15.2/20

**Bachelor degree in Computer Science**, University of Strasbourg, France June 2012

Ranked 5'/50. Grade: 13.87/20

## Professional Experience

**Postdoctoral researcher**, University of Strasbourg, France Sept. 2021 -

Advised by Prof. Cristel Pelsser in the Computer Networks Group Apr. 2023

- I research how to quickly detect and mitigate BGP leaks and hijacks.
- I study which BGP vantage points to use when measuring Internet routing.

**Postdoctoral researcher**, Georgia Tech, GA, USA Sept. 2022 -

Advised by Prof. Alberto Dainotti in the Internet Intelligence Lab Dec. 2022

- I researched on how to build a data-driven network Telescope.
- I was an instructor in a Master-level class about Internet routing and P4.

<b>Research and Teaching Assistant</b> , ETH Zürich, Switzerland Supervised by Prof. Laurent Vanbever in the Networked Systems Group	Feb. 2015 - Aug. 2021
<ul style="list-style-type: none"> <li>I developed a framework to improve the Internet convergence upon failures. Published in [2,3,6,8], see <a href="http://blink.ethz.ch">blink.ethz.ch</a> and <a href="http://swift.ethz.ch">swift.ethz.ch</a> for further information.</li> <li>I developed a "mini-Internet" platform to give students hands on experience on real routers configuration. We published the platform in [1].</li> </ul>	
<b>Visiting Student</b> , University College London, UK Supervised by Dr. Stefano Vissicchio in the Department of Computer Science	May 2018 - July 2018
<ul style="list-style-type: none"> <li>I developed a P4 program to detect Internet failures in the data plane. The program is used in [2], and publicly available at <a href="https://github.com/nsg-ethz/Blink">github.com/nsg-ethz/Blink</a>.</li> </ul>	
<b>Junior Researcher</b> , University of California San Diego, CA, USA Supervised by Dr. Alberto Dainotti in the Center for Applied Internet Data Analysis	June 2016 - Dec. 2016
<ul style="list-style-type: none"> <li>I measured the Internet convergence time upon failures using real BGP data as well as a simulator. Results are used in [3].</li> </ul>	
<b>Research Intern</b> , Internet Initiative Japan, Tokyo, Japan Supervised by Prof. Cristel Pelsser and Randy Bush	June 2014 - Dec. 2014
<ul style="list-style-type: none"> <li>I studied how accurate are Internet measurement platforms such as RIPE Atlas, and we published the work in [4] and [7].</li> </ul> <p>Results are presented in my Master thesis: <a href="https://dropbox.com/s/fuvamzi5sv1hawq/Mthesis.pdf">dropbox.com/s/fuvamzi5sv1hawq/Mthesis.pdf</a>.</p>	
<b>Research Intern</b> , University of Strasbourg, France Supervised by Dr. Pascal Merindol in the ICube laboratory	June 2013 - Aug. 2013 & Jan. 2014 - July 2014
<ul style="list-style-type: none"> <li>I optimized algorithms designed to prevent forwarding loops.</li> </ul>	

## Publications

**[1] An Open Platform to Teach How the Internet Practically Works** in CCR 2020

🏆 One of the three "Best of CCR" papers presented at SIGCOMM 2020

T. Holterbach, T. Bühler, T. Rellstab and L. Vanbever

**[2] Blink: Fast Connectivity Recovery Entirely in the Data Plane** in NSDI 2019

T. Holterbach, E. Costa Molero, M. Apostolaki, S. Vissicchio, A. Dainotti and L. Vanbever

**[3] SWIFT: Predictive Fast Reroute** in SIGCOMM 2017

T. Holterbach, S. Vissicchio, A. Dainotti and L. Vanbever

**[4] Quantifying Interferences Between Measurements on the RIPE Atlas Platform** in IMC 2015

T. Holterbach, C. Pelsser, R. Bush and L. Vanbever

## Workshop papers, posters and demos

### [5] (Self) Driving Under the Influence: Intoxicating Adversarial Network Inputs, in HotNets 2019

R. Meier, T. Holterbach, S. Keck, M. Stähli, V. Lenders, A. Singla and L. Vanbever

### [6] Boosting the BGP convergence in SDXes with SWIFT, in SIGCOMM 2017

P. Mao, R. Birkner, T. Holterbach and L. Vanbever

### [7] Measurement Vantage Point Selection Using A Similarity Metric in IRTF & ISOC ANRW

T. Holterbach, E. Aben, C. Pelsser, R. Bush, L. Vanbever

### [8] Supercharge me: Boost Router Convergence with SDN, in SIGCOMM 2015

M. Alan Chang, T. Holterbach, M. Happe, L. Vanbever

## Skills

### Computer Networks:

Strong Skills	Network protocols and tools, Internet architecture, Software-defined networking, Programmable data planes (P4)
Protocols	STP, IP, BGP, OSPF, MPLS, TCP, DNS, OpenFlow, NetFlow, etc
Tools	Quagga/BIRD, Openvswitch, RIPE Atlas, BGPSummary, Tcpdump, Netfilter, OpenVPN, etc
Extra	Cisco IOS, Graph algorithms, Network security, Wireless sensor network

### Computer Science:

Strong Skills	Python and C programming, UNIX systems, Algorithm design
Languages	C, Python, Java, Bash, R, SQL, etc
Tools	Virtualbox/KVM, Docker, Vagrant, Valgrind, Git, etc
Extra	Machine learning, Data Mining, Distributed systems, Hardware programming, Parallel programming, Compilation, Probability and Statistics

### Languages:

French	Mother tongue
English	5+ years of experience in writing, presenting and teaching

## Teaching and Mentoring

### Lectures at ETH Zürich:

Communication Networks	2016 - 2022
Advanced Topics in Communication Networks	2018 - 2020
Discrete Event Systems	2019 - 2020

### Students supervision:

3 Master thesis (6 months) and 12 Semester thesis (3 months) supervised at ETH Zürich

## Activities and Services

<b>TPC Member for the poster session</b> for ACM IMC	2022
<b>TPC Member for the Artifact Evaluation</b> for ACM CoNEXT	2020
<b>Shadow TPC member</b> for ACM IMC	2019
<b>Occasional Reviewer</b> for IEEE/ACM ToN and ACM CCR	2016 - 2020
<b>CAIDA BGP Hackathon</b> , San Diego, CA, USA (travel granted)	Feb. 2016
<b>PhD School on Software-defined Networks</b> , Heraklion, Greece	July 2015
<b>PhD School on Traffic Monitoring and Analysis</b> , Barcelona, Spain (travel granted)	April 2015
<b>RIPE Atlas Hackathon</b> , Amsterdam, Netherlands, (travel granted)	March 2015

## References

References available upon request.