

# Klaus-Tycho Foerster

Faculty of Computer Science, University of Vienna  
Waehringer Str. 29, A-1090 Vienna, Austria

<https://www.foerster.me>  
[klaus-tycho.foerster@univie.ac.at](mailto:klaus-tycho.foerster@univie.ac.at)

## RESEARCH INTERESTS

Algorithms and complexity in networked and distributed systems, in particular software-defined networks, demand-aware/reconfigurable networks, resilience and fault-tolerance, and didactics

## HIGHER EDUCATION

2011 – 2016	PhD at Dept. of Information Technology and Electrical Engineering, ETH Zurich, Switzerland, PhD Supervisor: Roger Wattenhofer
2002 – 2011	Diploma, Dept. of Computer Science, Braunschweig TU, Germany
2008 – 2010	Second State Examination, Studiensem. Göttingen, Göttingen, Germany
2002 – 2007	Diploma, Dept. of Mathematics, Braunschweig TU, Germany

## RECENT POSITIONS

02.2018 –	Postdoc at University of Vienna, Austria
01.2017 – 01.2018	Postdoc at Aalborg University, Denmark
10.2016 – 12.2016	Visiting Researcher at Microsoft Research, Redmond, USA
10.2011 – 09.2016	Research Assistant at ETH Zurich, Switzerland

## AWARDS

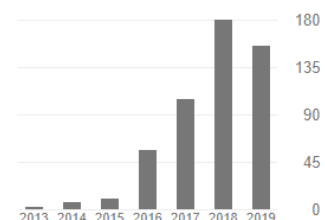
2019	Best Paper Award at IFIP Networking conference
2019	Awarded for most publications of PostDocs at CS faculty U. Vienna (2018)
2016	Best Paper Award at IEEE ICDCN conference

## PROFESSIONAL AND SCHOLARLY ACTIVITIES

- Program Committees: IFIP Networking 2017-2020, SR+SFC 2019, ALGO CLOUD 2018
- PC (special sessions): ICL 2019 (co-chair), IEEE EDUCON 2018-19, IMCL 2017, ICL 2017
- Publicity Chair at ALGOSENSORS 2015
- Senior Editor, International Journal of Engineering Pedagogy (as of 2018)
- IGIP Working Group Games in Engineering and Education
- Reviewer for the Mathematical Reviews of the American Mathematical Society
- Reviewer for the German-Israeli Foundation for Scientific Research and Development

## PUBLICATION SUMMARY

- Google Scholar: [https://scholar.google.com/citations?user=bLUw\\_lkAAAAJ](https://scholar.google.com/citations?user=bLUw_lkAAAAJ)
- DBLP: <https://dblp.uni-trier.de/pers/hd/f/F=ouml=rster:Klaus=Tycho>
- ORCID: <https://orcid.org/0000-0003-4635-4480>
- Over 50 refereed publications (e.g., **2x SIGCOMM**, **2x HotNets**, **3x INFOCOM**)
- 2 book chapters
- As of 16.08.2019, Google Scholar:
  - Cited 524 times
  - h-index of 12
  - i10-index of 16



## PUBLICATIONS

### 10 Selected Journals (full list at <https://www.foerster.me>)

1. Survey of Reconfigurable Data Center Networks: Enablers, Algorithms, Complexity. Klaus-T. Foerster and Stefan Schmid. ACM SIGACT News, Volume 50(2), pp. 62-79 June 2019.
2. Survey of Consistent Software-Defined Network Updates. Klaus-T. Foerster, Stefan IEEE Communications Surveys and Tutorials (COMST), Volume 21, Issue 2, pp. 1435-1461, secondquarter 2019.
3. On the Complexity of Non-Segregated Routing in Reconfigurable Data Center Architectures. Klaus-T. Foerster, Maciej Pacut, and Stefan Schmid. ACM SIGCOMM Computer Communication Review (CCR), Volume 49, Issue 2, pp. 3-8, April 2019.
4. Congestion-Free Rerouting of Multiple Flows in Timed SDNs. Jiaqi Zheng, Bo Li, Chen Tian, Klaus-T. Foerster, Stefan Schmid, Guihai Chen, Jie Wu, and Rui Li. IEEE Journal on Selected Areas in Communications (JSAC), Volume 37, Issue 5, pp. 968-981, May 2019.
5. Loop-Free Route Updates for Software-Defined Networks. Klaus-T. Foerster, Arne Ludwig, Jan Marcinkowski, and Stefan Schmid. IEEE/ACM Transactions on Networking (ToN), Volume 26, Issue 1, pp. 328-341, February 2018.
6. Local Fast Failover Routing with Low Stretch. Klaus-T. Foerster, Yvonne-A. Pignolet, Stefan Schmid, and Gilles Tredan. ACM SIGCOMM Computer Communication Review (CCR), Volume 48, Issue 1, pp. 35-41, January 2018.
7. Charting the Algorithmic Complexity of Waypoint Routing. Saeed Akhoondian Amiri, Klaus-T. Foerster, Riko Jacob, and Stefan Schmid. ACM SIGCOMM Computer Communication Review (CCR), Volume 48, Issue 1, pp. 42-48, January 2018.
8. Local Checkability, No Strings Attached: (A)cyclicity, Reachability, Loop Free Updates in SDNs. Klaus-T. Foerster, Thomas Luedi, Jochen Seidel, and Roger Wattenhofer. Theoretical Computer Science (TCS), Volume 709, pp. 48-63, January 2018.
9. Augmenting Flows for the Consistent Migration of Multi-Commodity Single-Destination Flows in SDNs. Sebastian Brandt, Klaus-T. Foerster, and Roger Wattenhofer. Pervasive and Mobile Computing (PMC), Volume 36, pp. 134-150, April 2017.
10. Lower and Upper Competitive Bounds for Online Directed Graph Exploration. Klaus-T. Foerster and Roger Wattenhofer. Theoretical Computer Science (TCS), Volume 655, Part A, pp. 15-29, Dec. 2016.

### 20 Selected Workshop and Conference Proceedings (full list at <https://www.foerster.me>)

1. Improved Fast Rerouting Using Postprocessing (**Best paper session**). Klaus-T. Foerster, Andrzej Kamisiński, Yvonne-A. Pignolet, Stefan Schmid, Gilles Tredan. 38th International Symposium on Reliable Distributed Systems (SRDS), Lyon, France, October 2019.
2. Bonsai: Efficient Fast Failover Routing. Klaus-T. Foerster, Andrzej Kamisiński, Yvonne-A. Pignolet, Stefan Schmid, and Gilles Tredan. 49th IEEE/IFIP Int. Conference on Dependable Systems and Networks (DSN), Portland, OR, USA, June 2019.
3. DaRTree: Deadline-aware Multicast Transfers in Reconfigurable Wide-Area Networks. Long Luo, Klaus-T. Foerster, Stefan Schmid, and Hongfang Yu. 27th IEEE/ACM International Symposium on Quality of Service (IWQoS), Phoenix, AZ, USA, June 2019.
4. Efficient Non-Segregated Routing for Reconfigurable Demand-Aware Networks. Thomas Fenz, Klaus-T. Foerster, Stefan Schmid, and Anaïs Villedieu. 18th IFIP Networking Conference (IFIP Networking), Warsaw, Poland, May 2019 (**Best Paper Award**).

5. Latency and Consistent Flow Migration: Relax for Lossless Updates. Klaus-T. Foerster, Laurent Vanbever, and Roger Wattenhofer. 18th IFIP Networking Conference (IFIP Networking), Warsaw, Poland, May 2019.
6. On the Power of Preprocessing in Decentralized Network Optimization. Klaus-T. Foerster, Juho Hirvonen, Stefan Schmid, and Jukka Suomela. 39th IEEE International Conference on Computer Communications (**INFOCOM**), Paris, France, April 2019.
7. CASA: Congestion and Stretch Aware Static Fast Rerouting. (Best-in-session presentation award). Klaus-T. Foerster, Yvonne-A. Pignolet, Stefan Schmid, and Gilles Tredan. 39th IEEE International Conference on Computer Communications (**INFOCOM**), Paris, France, April 2019.
8. Local Fast Segment Rerouting on Hypercubes. Klaus-T. Foerster, Mahmoud Parham, Stefan Schmid, and Tao Wen. 22nd International Conference on Principles of Distributed Systems (OPODIS), Hong Kong, December 2018.
9. RADWAN: Rate Adaptive Wide Area Network. Rachee Singh, Manya Ghobadi, Klaus-T. Foerster, Mark Filer, and Phillipa Gill. Annual Conference of the ACM Special Interest Group on Data Communication (**SIGCOMM**), Budapest, Hungary, August 2018.
10. Characterizing the Algorithmic Complexity of Reconfigurable Data Center Architectures. Klaus-T. Foerster, Manya Ghobadi, and Stefan Schmid. 14th ACM/IEEE Symposium on Architectures for Netw. and Communications Systems (ANCS), Ithaca, NY, USA, July 2018.
11. Scheduling Congestion-Free Updates of Multiple Flows with Chronicle in Timed SDNs. Jiaqi Zheng, Bo Li, Chen Tian, Klaus-T. Foerster, Stefan Schmid, Guihai Chen, and Jie Wu. 38th IEEE International Conference on Distributed Computing Systems (ICDCS), Vienna, Austria, July 2018.
12. Run, Walk, Crawl: Towards Dynamic Link Capacities. Rachee Singh, Monia Ghobadi, Klaus-T. Foerster, Mark Filer, and Phillipa Gill. 16th ACM Workshop on Hot Topics in Networks (**HotNets**), Palo Alto, CA, USA, November 2017.
13. Understanding and Mitigating Packet Corruption in Data Center Networks. Danyang Zhuo, Monia Ghobadi, Ratul Mahajan, Klaus-T. Foerster, Arvind Krishnamurthy, and Thomas Anderson. Annual Conference of the ACM Special Interest Group on Data Communication (**SIGCOMM**), Los Angeles, CA, USA, August 2017.
14. Teaching Spatial Geometry in a Virtual World: Using Minecraft in Mathematics in Grade 5/6. Klaus-T. Foerster. 8th IEEE Global Engineering Education Conference (EDUCON), Athens, Greece, April 2017.
15. Integrating Programming into the Mathematics Curriculum: Combining Scratch and Geometry in Grades 6 and 7. Klaus-T. Foerster. 17th Annual Conference on Information Technology Education (SIGITE), Boston, MA, USA, September 2016.
16. Consistent Updates in Software Defined Networks: On Dependencies, Loop Freedom, and Blackholes. Klaus-T. Foerster, Ratul Mahajan, and Roger Wattenhofer. 15th IFIP Networking Conference (IFIP Networking), Vienna, Austria, May 2016. *Invited to a special issue of IFIP TC6 journal Open Trans. on Communication Systems*
17. On Consistent Migration of Flows in SDNs (Best-in-session presentation award). Sebastian Brandt, Klaus-T. Foerster, and Roger Wattenhofer. 36th IEEE International Conference on Computer Communications (**INFOCOM**), San Francisco, California, USA, April 2016.
18. Local Checkability, No Strings Attached. Klaus-T. Foerster, Thomas Luedi, Jochen Seidel, and Roger Wattenhofer. 17th International Conference on Distributed Computing and Networking (ICDCN), Singapore, January 2016 (**Best paper award**).

19. Destroying networks for fun (and profit). Nick Shelly, Brendan Tschaen, Klaus-T. Foerster, Michael Chang, Theophilus Benson, and Laurent Vanbever. 14th ACM Workshop on Hot Topics in Networks (**HotNets**), Philadelphia, PA, USA, November 2015.
20. Deterministic Leader Election in Multi-Hop Beeping Networks. Klaus-T. Foerster, Jochen Seidel, and Roger Wattenhofer. 28th International Symposium on Distributed Computing (DISC), Austin, Texas, USA, October 2014.

## TUTORIALS

1. Central Control over Distributed Asynchronous Systems: A Tutorial on Software-Defined Networks and Consistent Network Updates. Tutorial at PODC 2019, August 2019.
2. Reconfigurable Networks: Enablers, Algorithms, Complexity. With Ramakrishnan Durairajan and Stefan Schmid. Tutorial at SIGMETRICS 2019, June 2019.

## TALKS (5 selected, more at <http://www.foerster.me/#talks> )

1. On Scheduling Consistent Software-Defined Network Updates. Dagstuhl Seminar 18101 on Scheduling, Schloss Dagstuhl, Germany, March 2018.
2. Towards Lossless Data Center Reconfiguration: Consistent Network Updates in SDNs. DIMACS Workshop on Algorithms for Data Center Networks, DIMACS Center, Rutgers University, New Brunswick, NJ, USA, June 2017.
3. Don't disturb my Flows: Consistent Migration in SDNs. NSF Algorithms in the Field (AiTF) Workshop on Algorithms for Software-Defined Networking, DIMACS Center, Rutgers University, New Brunswick, NJ, USA, June 2016.
4. Moving Network Flows without Congestion: Different Models, different Complexities. Department of Computer Science, Princeton University, Princeton, NJ, USA, June 2016.
5. Local Checkability, No Strings Attached. Theory of Distributed Systems Group, MIT, Cambridge, MA, USA, December 2015.

## UNIVERSITY TEACHING EXPERIENCE

- Network Technologies (w. Stefan Schmid), University of Vienna, Austria, Winter 19.
- Advanced Topics in Networks (w. S. Schmid & A. Paz), U. of Vienna, Austria, Winter 19
- Operating Systems (w. Stefan Schmid), University of Vienna, Austria, Summer 19.
- Didactics of Computer Science 2, University of Hildesheim, Germany, Winter 18/19.
- Didactics of Computer Science 1, University of Hildesheim, Germany, Winter 17/18.
- Specialization Course in Distributed Systems (part of a teaching team), Aalborg University, Denmark, Fall 2017.
- Teaching assistant (exercises, exams etc.) for over 10 different courses & labs (networking, operating systems, computer engineering, discrete event systems, distributed systems etc.)
- Mentoring of over 45 students for their theses (U. Vienna, Aalborg U., ETH Zurich)