

# Klaus-Tycho Foerster

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## RESEARCH INTERESTS

Algorithms and fundamental problems of networked and distributed systems, especially software-defined networks, optical networks, resilience and fault-tolerance, and education.

## HIGHER EDUCATION

- 10.2016 **Dr. sc.** at Department of Information Technology & Electrical Engineering, **ETH Zurich**, Switzerland, PhD advisor: Prof. Dr. Roger Wattenhofer
- 07.2011 Diploma, Department of Computer Science, **TU Braunschweig**, Germany  
Thesis advisor: Prof. Dr. Jirí Adámek

## PROFESSIONAL EXPERIENCE

- 02.2018 – 09.2021 PostDoc at **University of Vienna**, Austria
- 01.2017 – 01.2018 PostDoc at **Aalborg University**, Denmark
- 10.2016 – 12.2016 Visiting Researcher at **Microsoft Research**, Mobility and Networking Research group, Redmond, WA, USA
- 10.2011 – 09.2016 Research Assistant at **ETH Zurich**, Switzerland

## AWARDS

- 2021 University of Vienna **Teaching Award 2020** (7 out of ≈ 7 000 courses awarded)
- 2019 **Best Paper Award**, SRDS conference
- 2019 **Best Paper Award**, IFIP Networking conference
- 2016 **Best Paper Award**, ICDCN conference

## PUBLICATION OVERVIEW

- 19 journal articles (e.g., IEEE/ACM Transactions on Networking, IEEE JSAC)
- 46 conference papers (e.g., ACM SIGMETRICS, ACM SIGCOMM, IEEE INFOCOM)
  - 3 best paper awards, 7 invitations to special journal issues
- 7 workshop papers (e.g., ACM HotNets, ANALCO), 2 book chapters

## SELECTED PUBLICATIONS

- *Grafting Arborescences for Extra Resilience of Fast Rerouting Schemes.*  
K.-T. Foerster, A. Kamisiński, Y.-A. Pignolet, S. Schmid, and G. Tredan.  
**IEEE INFOCOM 2021**
- *Input-dynamic distributed algorithms for communication networks.*  
K.-T. Foerster, J. H. Korhonen, A. Paz, J. Rybicki, and S. Schmid.  
**ACM SIGMETRICS 2021**
- *OptFlow: A Flow-based Abstraction for Programmable Topologies.*  
K.-T. Foerster, L. Luo and M. Ghobadi.  
**ACM SOSR 2020**
- *Improved Fast Rerouting Using Postprocessing.*  
K.-T. Foerster, A. Kamisiński, Y.-A. Pignolet, S. Schmid, and G. Tredan.  
**IEEE SRDS 2019** (Best Paper Award)
- *RADWAN: Rate Adaptive Wide Area Network*  
R. Singh, M. Ghobadi, K.-T. Foerster, M. Filer, and P. Gill.  
**ACM SIGCOMM 2018**

## TEACHING OVERVIEW

- Instructor in 6 different courses, co-instructor in 5 different courses
- Instructor in 5 different laboratory and practical classes, TA in 7 different courses
- Over 10 years of university teaching experience, over 40 courses in total
- Over 50 students (co-)advised/mentored for their thesis

## TALK OVERVIEW

- Invited talks at e.g. Dagstuhl, DIMACS & NSF workshops, Harvard, Cornell, Princeton, MIT
- Multiple conference talks every year, presentation awards at IEEE INFOCOM
- Tutorials at ACM PODC and ACM SIGMETRICS

## HIGHER EDUCATION in MATHEMATICS

08.2020	<b>Dr. phil.</b> in Mathematics Education, University of Hildesheim, Germany, PhD advisor: Prof. Dr. Barbara Schmidt-Thieme
10.2010	Second State Examination, Studiens. Göttingen, Göttingen, Germany Thesis advisor: Prof. Dr. Eckart Modrow (2-year teaching degree)
10.2007	Diploma, Department of Mathematics, TU Braunschweig, Germany Thesis advisor: Prof. Dr. Sándor Fekete

## PROFESSIONAL EXPERIENCE in MATHEMATICS

11.2010 – 10.2011	Research Assistant at University of Hildesheim, Germany
11.2008 – 10.2010	Teacher-in-training at Max-Planck high school, Göttingen, Germany

## PROFESSIONAL AND SCHOLARLY ACTIVITIES

- Program Committees: SRDS 2021, IEEE ICDCS 2021, IFIP Networking 2017-2021, IEEE SR+SFC 2019, ALGOCLOUD 2018/2021, IEEE Global Internet Symposium 2020
- PC (sp.tr): ICL '21/'19 (co-chair), IEEE EDUCON '18-'20, '21 (co-chair), IMCL '17, ICL '20/'17
- Publicity Chair at ALGOSENSORS 2015 and IEEE ICDCS 2021 [Track Distributed Alg.]
- Senior Editor, International Journal of Engineering Pedagogy (since 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
- Reviewer for the following conferences:
  - CIAC, DISC, EDUCON, Euro-Par, ICALP, ICL, ICDCN, ICDCS, ICPP, IMCL, INFOCOM, MFCS, PODC, SEA, SIGITE, SIROCCO, SODA, SOFSEM, SPAA, SSS
- Reviewer for the following journals:
  - Journal of the ACM, ACM SIGCOMM Computer Communications Review, ACM Transactions on Algorithms, IEEE/ACM Transactions on Networking, IEEE Transactions on Services Computing, IEEE Transactions on Network and Service Management, IEEE Communications Letters, IEEE Transactions on Network Science and Engineering, IEEE Journal on Selected Areas in Communications, Elsevier Computer Networks, Distributed Computing, Discrete Applied Mathematics, The Computer Journal, PLOS ONE, Theoretical Computer Science, Journal of Scheduling, IEEE Access

## FUNDING

- netldee (Internet Foundation Austria) grant on local resilience for computer networks  
Principal investigator, funding for one student worker for 6 months, ≈ 8000 Euro  
Funding period 01/2021 – 06/2021

## TEACHING EXPERIENCE

### Instructor:

- Undergraduate courses:
  - Operating Systems, University of Vienna, Austria, Summer '21, '20.
    - **UNIVIE Teaching Award 2020**
  - Seminar computer science education (Seminar Didaktik der Informatik), University of Hildesheim, Germany, Summer '18.
  - Computer science education (Didaktik der Informatik), University of Hildesheim, Germany, Winter '17/'18.
- Graduate courses:
  - Network Algorithms, University of Vienna, Winter '20/'21
  - Advanced seminar computer science education (Seminar Didaktik der Informatik 2), University of Hildesheim, Germany, Winter '18/'19.
  - Advanced computer science education (Didaktik der Informatik 2), University of Hildesheim, Germany, Summer '18.

### Co-instructor:

- Graduate courses:
  - Advanced Topics in Networks, University of Vienna, Austria, Winter '19/'20.
  - Specialization Course in Distributed Systems, Aalborg University, Denmark, Fall '17.
  - Seminar Algorithms & Information technology, U. Hildesheim, Germany, Summer '11.
- Undergraduate courses:
  - Network Technologies, Univ. of Vienna, Austria, Winter '19/'20, '20/'21
  - Operating Systems, University of Vienna, Austria, Summer '19.

### Instructor (laboratory and practical classes):

- Graduate courses:
  - Practical class on how to be a mathematics teacher (Fachpraktikum Mathematik), University of Hildesheim, Germany, Summer '11, Winter '10/'11.
- Undergraduate courses:
  - Programming 1, University of Vienna, Austria, Winter '19/'20.
  - Network Technologies, University of Vienna, Austria, Winter '19/'20, '18/'19.
  - Operating Systems, University of Vienna, Austria, Summer '19, '18.
  - Information & Communication Technology, University of Hildesheim, Germany, Summer '11, Winter '10/'11.

### Teacher at Max-Planck high school Göttingen, Germany:

- Mathematics and computer science in grades 5-13, November '08 to October '10.

### Graduate teaching assistant at ETH Zurich, Switzerland:

- Computer Engineering 2, Spring '16.
- Discrete Event Systems, Fall '15, '14, '13, '12.
- Distributed Systems, Fall '15, '14.
- Seminar in Distributed Computing (co-organizer), Fall '15, '14.
- Principles of Distributed Computing, Spring '14, '13, '12.

### Undergraduate teaching assistant at Braunschweig University of Technology, Germany:

- Theoretische Informatik II, Summer '08, '07.
- Theoretische Informatik I, Winter '07/'08, '06/'07.

### Thesis co-advisor at the University of Vienna, Austria:

- Master thesis in computer science (1 student), Spring '20
- Term theses in computer science (5 students), Spring '19 – Spring '21
- Bachelor theses in computer science (10 students), Spring '19 – Spring '21
  - Resulted in publications at ICDCN 2021 and ICISSP 2020
- Bachelor theses in computer science education (3 students), Winter '19, '20

### Thesis advisor at Aalborg University, Denmark:

- Term thesis (6 graduate students) on escaping the filter bubble, Fall '17
- Master thesis (1 student) on distributed music, Aalborg University, Fall '17 (co-advisor)
- Bachelor thesis (3 students) on an automated tourist guide, Spring '17

### Thesis mentoring at ETH Zurich, Switzerland:

- Over 30 students (master, bachelor, term thesis) during 2011-2016:
  - Resulted in publications at MUM (2x), SIROCCO (2x), ICDCN, IEEE NCA, IEEE CCNC, CIAC, Theoretical Computer Science, android apps, and security startup.

## TUTORIALS

- *Central Control over Distributed Asynchronous Systems: A Tutorial on Software-Defined Networks and Consistent Network Updates.*  
Tutorial at ACM PODC 2019, August 2019.
- *Reconfigurable Networks: Enablers, Algorithms, Complexity.*  
Jointly held with Ramakrishnan Durairajan and S. Schmid.  
Tutorial at ACM SIGMETRICS 2019, June 2019.

## PUBLICATIONS

**Journal articles** (a \* marks the corresponding author if the journal lists one)

1. A Survey of Reconfigurable Optical Networks.  
M. Nance Hall, K.-T. Foerster, S. Schmid, and R. Durairajan.  
Optical Switching and Networking (OSN), Volume 41, 100621, September 2021.
2. *Improved Fast Rerouting Using Postprocessing.*  
\*K.-T. Foerster, Andrzej Kamiński, Y.-A. Pignolet, S. Schmid and G. Tredan.  
IEEE Transactions on Dependable and Secure Computing, accepted 2020, to appear.
3. *Efficient Non-Segregated Routing for Reconfigurable Demand-Aware Networks.*  
T. Fenz, \*K.-T. Foerster, S. Schmid and A. Villedieu.  
Computer Communications, Vol. 164, pp. 138-147, December 2020.
4. *Online Graph Exploration on a Restricted Graph Class: Optimal Solutions for Tadpole Graphs*  
S. Brandt, \*K.-T. Foerster, J. Maurer, and R. Wattenhofer.  
Theoretical Computer Science, Vol. 839, pp. 176-185, November 2020.
5. *AirNet: Energy-Aware Deployment and Scheduling of Aerial Networks*  
\*E. Bozkaya, K.-T. Foerster, S. Schmid, and B. Canberk.  
IEEE Transactions on Vehicular Technology, Vol. 69(10), pp. 12252-12263, Oct. 2020.
6. *Inter-Datacenter Bulk Transfers: Trends and Challenges.*  
L. Luo, H. Yu, K.-T. Foerster, M. Noormohammadpour, and S. Schmid.  
IEEE Network Magazine, Vol. 34(5), pp. 240-246, September/October 2020.
7. *Deadline-Aware Multicast Transfers in Software-Defined Optical Wide-Area Networks.*  
L. Luo, K.-T. Foerster, S. Schmid, and \*H. Yu.  
IEEE Journal on Selected Areas in Communications, Vol. 38(7), pp. 1584-1599, July 2020.
8. *Walking through Waypoints.*  
S. Akhoondian Amiri, \*K.-T. Foerster and S. Schmid.  
Algorithmica (ALGO), Vol. 82(7), pp. 1784-1812 May 2020.
9. *Wireless Evacuation on  $m$  Rays with  $k$  Searchers.*  
S. Brandt, \*K.-T. Foerster, B. Richner and R. Wattenhofer.  
Theoretical Computer Science, Vol. 811, pp. 56-69, April 2020.

10. *Survey of Reconfigurable Data Center Networks: Enablers, Algorithms, Complexity.*  
K.-T. Foerster and S. Schmid.  
ACM SIGACT News, Vol. 50(2), pp. 62-79, June 2019.
11. *Survey of Consistent Software-Defined Network Updates.*  
\*K.-T. Foerster, S. Schmid and S. Vissicchio.  
IEEE Communications Surveys and Tutorials, Vol. 21(2), pp. 1435-1461, sq. 2019.
12. *Congestion-Free Rerouting of Multiple Flows in Timed SDNs.*  
J. Zheng, B. Li, \*C. Tian, K.-T. Foerster, S. Schmid, \*G. Chen, J. Wu and R. Li.  
IEEE Journal on Selected Areas in Communications, Vol. 37(5), pp. 968-981, May 2019.
13. *On the Complexity of Non-Segregated Routing in Reconfigurable Data Center Architectures.*  
K.-T. Foerster, M. Pacut and S. Schmid.  
ACM SIGCOMM Computer Communication Review, Vol. 49(2), pp. 3-8, April 2019.
14. *Loop-Free Route Updates for Software-Defined Networks.*  
\*K.-T. Foerster, A. Ludwig, J. Marcinkowski and S. Schmid.  
IEEE/ACM Transactions on Networking, Vol. 26(1), pp. 328-341, February 2018.
15. *Local Fast Failover Routing with Low Stretch.*  
K.-T. Foerster, Y.-A. Pignolet, S. Schmid and G. Tredan.  
ACM SIGCOMM Computer Communication Review, Vol. 48(1), pp. 35-41, Jan. 2018.
16. *Charting the Algorithmic Complexity of Waypoint Routing.*  
S. Akhoondian Amiri, K.-T. Foerster, R. Jacob and S. Schmid.  
ACM SIGCOMM Computer Communication Review, Vol. 48(1), pp. 35-41, Jan. 2018.
17. *Local Checkability, No Strings Attached: (A)cyclicity, Reachability, Loop Free Updates in SDNs.*  
\*K.-T. Foerster, T. Luedi, J. Seidel and R. Wattenhofer.  
Theoretical Computer Science, Vol. 709, pp. 48-63, January 2018.
18. *Augmenting Flows for the Consistent Migration of Multi-Commodity Single-Destination Flows in SDNs.*  
S. Brandt, \*K.-T. Foerster and R. Wattenhofer.  
Pervasive and Mobile Computing, Vol. 36, pp. 134-150, April 2017.
19. *Lower and Upper Competitive Bounds for Online Directed Graph Exploration.*  
\*K.-T. Foerster and R. Wattenhofer.  
Theoretical Computer Science, Vol. 655, Part A, pp. 15-29, December 2016.

### Conference papers

20. *Improved Scalability of Demand-Aware Datacenter Topologies With Minimal Route Lengths and Congestion.*  
M. Pacut, W. Dai, A. Labbe, K.-T. Foerster, and S. Schmid.  
39th International Symposium on Computer Performance, Modeling, Measurements and Evaluation (PERFORMANCE) 2021.
21. *Input-dynamic distributed algorithms for communication networks.*  
K.-T. Foerster, J. H. Korhonen, A. Paz, J. Rybicki, and S. Schmid.  
International Conf. on Measurement & Modeling of Computer Systems (SIGMETRICS) 2021.
22. *Demand-Aware Plane Spanners of Bounded Degree.*  
E. Ceylan, K.-T. Foerster, S. Schmid, and K. Zaitsava.  
20th IFIP Networking Conference (Networking) 2021.
23. *Grafting Arborescences for Extra Resilience of Fast Rerouting Schemes*  
K.-T. Foerster, A. Kamisiński, Y.-A. Pignolet, S. Schmid and G. Tredan.  
40th IEEE International Conference on Computer Communications (INFOCOM) 2021.

24. *On the Feasibility of Perfect Resilience with Local Fast Failover*  
K.-T. Foerster, J. Hirvonen, Y.-A. Pignolet, S. Schmid and G. Tredan.  
 2nd SIAM Symposium on Algorithmic Principles of Computer Systems (APOCS) 2021.
25. *Node Classification and Geographical Analysis of the Lightning Network*  
 P. Zabka, K.-T. Foerster, S. Schmid, and C. Decker.  
 22nd International Conference on Distributed Computing and Networking (ICDCN) 2021.  
*Invited to a special issue of Pervasive and Mobile Computing*
26. *Maximally Resilient Replacement Paths for a Family of Product Graphs*  
 M. Parham, K.-T. Foerster, P. Kobic, and S. Schmid.  
 24th International Conference on Principles of Distributed Systems (OPODIS) 2020.
27. *Load-Optimization in Reconfigurable Networks: Algorithms and Complexity of Flow Routing*  
 W. Dai, K.-T. Foerster, D. A. Fuchssteiner, and S. Schmid.  
 38th International Symposium on Computer Performance, Modeling, Measurements and Evaluation (PERFORMANCE) 2020.
28. *SplitCast: Optimizing Multicast Flows in Reconfigurable Datacenter Networks*  
 L. Luo, K.-T. Foerster, S. Schmid and H. Yu.  
 40th IEEE International Conference on Computer Communications (INFOCOM) 2020.
29. *OptFlow: A Flow-based Abstraction for Programmable Topologies*  
K.-T. Foerster, L. Luo and M. Ghobadi.  
 6th ACM Symposium on SDN Research (SOSR) 2020.
30. *Toward Active and Passive Confidentiality Attacks On Cryptocurrency Off-Chain Networks.*  
 U. Nisslmueller, K.-T. Foerster, S. Schmid, and C. Decker  
 6th International Conference on Information Systems Security and Privacy (ICISSP) 2020.
31. *Improved Fast Rerouting Using Postprocessing.*  
K.-T. Foerster, A. Kamisiński, Y.-A. Pignolet, S. Schmid and G. Tredan.  
 38th International Symposium on Reliable Distributed Systems (SRDS) 2019.  
**Best paper award**  
*Invited to a special issue of IEEE Transactions on Dependable and Secure Computing*
32. *Distributed Consistent Network Updates in SDNs: Local Verification for Global Guarantees.*  
K.-T. Foerster and S. Schmid.  
 18th IEEE International Symposium on Network Computing and Applications (NCA) 2019.
33. *Bonsai: Efficient Fast Failover Routing.*  
K.-T. Foerster, A. Kamisiński, Y.-A. Pignolet, S. Schmid and G. Tredan.  
 49th IEEE/IFIP International Conference on Dependable Systems and Networks (DSN) 2019.
34. *DaRTree: Deadline-aware Multicast Transfers in Reconfigurable Wide-Area Networks.*  
 Long Luo, K.-T. Foerster, S. Schmid and Hongfang Yu.  
 27th IEEE/ACM International Symposium on Quality of Service (IWQoS) 2019.
35. *Efficient Non-Segregated Routing for Reconfigurable Demand-Aware Networks.*  
 T. Fenz, K.-T. Foerster, S. Schmid and A. Villedieu.  
 18th IFIP Networking Conference (Networking) 2019.  
**Best paper award**  
*Invited to a special issue of Computer Communications*
36. *Latency and Consistent Flow Migration: Relax for Lossless Updates.*  
K.-T. Foerster, L. Vanbever and R. Wattenhofer  
 18th IFIP Networking Conference (Networking) 2019.
37. *On the Power of Preprocessing in Decentralized Network Optimization.*  
K.-T. Foerster, J. Hirvonen, S. Schmid and J. Suomela.

- 39th IEEE International Conference on Computer Communications (INFOCOM) 2019.
38. *CASA: Congestion and Stretch Aware Static Fast Rerouting.*  
K.-T. Foerster, Y.-A. Pignolet, S. Schmid and G. Tredan.  
39th IEEE International Conference on Computer Communications (INFOCOM) 2019.
  39. *Local Fast Segment Rerouting on Hypercubes.*  
K.-T. Foerster, M. Parham, S. Schmid and T. Wen.  
22nd International Conference on Principles of Distributed Systems (OPODIS) 2018.
  40. *On the Consistent Migration of Splittable Flows: Latency-Awareness and Complexities.*  
K.-T. Foerster.  
17th IEEE International Symposium on Network Computing and Applications (NCA) 2018.
  41. *RADWAN: Rate Adaptive Wide Area Network.*  
R. Singh, M. Ghobadi, K.-T. Foerster, M. Filer and P. Gill.  
Annual Conference of the ACM Special Interest Group on Data Communication (SIGCOMM), 2018.
  42. *Characterizing the Algorithmic Complexity of Reconfigurable Data Center Architectures.*  
K.-T. Foerster, M. Ghobadi and S. Schmid.  
14th ACM/IEEE Symp. on Architectures for Networking and Communications Systems (ANCS) 2018.
  43. *Scheduling Congestion-Free Updates of Multiple Flows with Chronicle in Timed SDNs.*  
J. Zheng, B. Li, C. Tian, K.-T. Foerster, S. Schmid, G. Chen and J. Wu.  
38th IEEE International Conference on Distributed Computing Systems (ICDCS) 2018.
  44. *Waypoint Routing in Special Networks.*  
S. Akhoondian Amiri, K.-T. Foerster, R. Jacob, M. Parham and S. Schmid. 17th IFIP Networking Conference (IFIP Networking) 2018.
  45. *Walking through Waypoints.*  
S. Akhoondian Amiri, K.-T. Foerster and S. Schmid.  
13th Latin American Theoretical Informatics Symposium (LATIN) April 2018.
  46. *Teaching Programming Skills in Primary School Mathematics Classes.*  
E.-C. Foerster, K.-T. Foerster, and T. Loewe.  
9th IEEE Global Engineering Education Conference (EDUCON) 2018.
  47. *On the Consistent Migration of Unsplittable Flows: Upper and Lower Complexity Bounds.*  
K.-T. Foerster.  
16th IEEE International Symposium on Network Computing and Applications (NCA) 2017.
  48. *Understanding and Mitigating Packet Corruption in Data Center Networks.*  
D. Zhuo, M. Ghobadi, R. Mahajan, K.-T. Foerster, A. Krishnamurthy, and T. Anderson.  
Annual Conference of the ACM Special Interest Group on Data Communication (SIGCOMM), 2017.
  49. *Wireless Evacuation on  $m$  Rays with  $k$  Searchers.*  
S. Brandt, K.-T. Foerster, B. Richner and R. Wattenhofer.  
24th International Colloquium on Structural Information and Communication Complexity (SIROCCO) 2017.  
*Invited to a special issue of Theoretical Computer Science.*
  50. *Multi-Agent Pathfinding with  $n$  Agents on Graphs with  $n$  Vertices.*  
K.-T. Foerster, L. Groner, T. Hoeffler, M. Koenig, S. Schmid, and R. Wattenhofer.  
10th International Conference on Algorithms and Complexity (CIAC) 2017.
  51. *Teaching Spatial Geometry in a Virtual World: Using Minecraft in Mathematics in Grade 5/6.*  
K.-T. Foerster.  
8th IEEE Global Engineering Education Conference (EDUCON) 2017.

52. *Local Checkability in Dynamic Networks.*  
K.-T. Foerster, O. Richter, J. Seidel and R. Wattenhofer.  
 18th International Conference on Distributed Computing and Networking (ICDCN) 2017.
53. *Distributed Discussion Diarisation.*  
 P. Bissig, K.-T. Foerster, S. Tanner, and R. Wattenhofer.  
 14th Annual IEEE Consumer and Networking Conference (CCNC) 2017.
54. *RTDS: Real-Time Discussion Statistics.*  
 P. Bissig, J. Deriu, K.-T. Foerster and R. Wattenhofer.  
 15th International Conference on Mobile and Ubiquitous Multimedia (MUM) 2016.
55. *Reducing the Latency-Tail of Short-Lived Flows: Adding Forward Error Correction in Data Centers.*  
K.-T. Foerster, D. Jaeger, D. Stolz and R. Wattenhofer.  
 15th IEEE International Symposium on Network Computing and Applications (NCA) 2016.
56. *Integrating Programming into the Mathematics Curriculum: Combining Scratch and Geometry in Grades 6 and 7.*  
K.-T. Foerster.  
 Annual Conference of the ACM Special Interest Group for Information Technology Education (SIGITE), 2016.
57. *The Power of Two in Consistent Network Updates: Hard Loop Freedom, Easy Flow Migration.*  
K.-T. Foerster and R. Wattenhofer.  
 25th International Conference on Computer Communication and Networks (ICCCN) 2016.
58. *Consistent Updates in Software Defined Networks: On Dependencies, Loop Freedom, and Blackholes.*  
K.-T. Foerster, R. Mahajan and R. Wattenhofer.  
 15th IFIP Networking Conference (Networking) 2016.  
*Selected for forwarding to the IFIP TC6 Open Transactions on Communication Systems*
59. *On Consistent Migration of Flows in SDNs.*  
 S. Brandt, K.-T. Foerster and R. Wattenhofer.  
 36th IEEE International Conference on Computer Communications (INFOCOM) 2016.
60. *Augmenting Anycast Network Flows.*  
 S. Brandt, K.-T. Foerster and R. Wattenhofer.  
 17th International Conference on Distributed Computing and Networking (ICDCN) 2016.  
*Invited to a special issue of Pervasive and Mobile Computing*
61. *Local Checkability, No Strings Attached.*  
K.-T. Foerster, T. Luedi, J. Seidel and R. Wattenhofer.  
 17th International Conference on Distributed Computing and Networking (ICDCN) 2016.  
**Best paper award**  
*Invited to a special issue of Theoretical Computer Science*
62. *Lower Bounds for the Capture Time: Linear, Quadratic, and Beyond.*  
K.-T. Foerster, R. Nuridini, J. Uitto and R. Wattenhofer.  
 22nd International Colloquium on Structural Information and Communication Complexity (SIROCCO) 2015.
63. *SpareEye: A Smart Phone App that Enhances the Safety of the Inattentively Blind.*  
K.-T. Foerster, A. Gross, N. Hail, J. Uitto and R. Wattenhofer.  
 13th International Conference on Mobile and Ubiquitous Multimedia (MUM) 2014.
64. *Deterministic Leader Election in Multi-Hop Beeping Networks.*  
K.-T. Foerster, J. Seidel and R. Wattenhofer.  
 28th International Symposium on Distributed Computing (DISC) 2014



65. *Directed Graph Exploration*.  
K.-T. Foerster and R. Wattenhofer.  
16th International Conference on Principles of Distributed Systems (OPODIS) 2012.

### Workshop papers

66. Are WANs Ready for Optical Topology Programming?  
M. Nance Hall, P. Barford, K.-T. Foerster, M. Ghobadi, W. Jensen, and R. Durairajan.  
ACM SIGCOMM 2021 Workshop on Optical Systems (OptSys), 2021.
67. *Conic Formation in Presence of Faulty Robots*.  
D. Pattanayak, K.-T. Foerster, P. S. Mandal, and S. Schmid  
16th International Symposium on Algorithms and Experiments for Wireless Sensor Networks (ALGOSENSORS) 2020.
68. *TI-MFA: Keep Calm and Reroute Segments Fast*.  
K.-T. Foerster, M. Parham, M. Chiesa, and S. Schmid.  
21st IEEE Global Internet Symposium (GI), 2018.
69. *Run, Walk, Crawl: Towards Dynamic Link Capacities*.  
R. Singh, M. Ghobadi, K.-T. Foerster, M. Filer and P. Gill.  
16th ACM Workshop on Hot Topics in Networks (HotNets) 2017.
70. *A Walk in the Clouds: Routing through VNFs on Bidirected Networks*.  
K.-T. Foerster, M. Parham and S. Schmid.  
3rd Int. Workshop on Algorithmic Aspects of Cloud Computing (ALGO CLOUD), 2017.
71. *Destroying networks for fun (and profit)*.  
N. Shelly, B. Tschaen, K.-T. Foerster, M. Chang, T. Benson and L. Vanbever.  
14th ACM Workshop on Hot Topics in Networks (HotNets) 2015.
72. *Approximating Fault-Tolerant Domination in General Graphs*.  
K.-T. Foerster.  
10th Meeting on Analytic Algorithmics and Combinatorics (ANALCO) 2013.

### Brief announcements

73. *Brief Announcement: What Can(not) Be Perfectly Rerouted Locally*  
K.-T. Foerster, J. Hirvonen, Y.-A. Pigolet, S. Schmid, and G. Tredan.  
34th International Symposium on Distributed Computing (DISC) 2020.
74. *Brief Announcement: Does Preprocessing Help under Congestion?*  
K.-T. Foerster, J. Korhonen, J. Rybicki, and S. Schmid.  
ACM Symposium on Principles of Distributed Computing (PODC) 2019.

### Journal articles in German

75. *Minecraft: Raumgeometrie in virtuellen Welten*.  
K.-T. Foerster.  
Der Mathematikunterricht (MU), 4, pp. 3-13, August 2019.  
*Featured as cover image of the issue.*
76. *Scratch im Geometrieunterricht*.  
K.-T. Foerster.  
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77. *(Netzwerk-)Spiele*.  
K.-T. Foerster.  
Computer+Unterricht (C+U), 9, No. 36, p. 24, November 1999.
78. *Warum gibt es an Ihrer Schule noch keine Computerspiele-AG? Plädoyer für die Einrichtung von Netzwerk-Computerspiele-AGs an Schulen*.

K.-T. Foerster.

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### **Conference papers in German**

79. *Vom Flaggentalphabet zur Vorratsdatenspeicherung: Schülerinnen und Schüler als Multiplikatoren technischer Aspekte der digitalen Welt.*

K.-T. Foerster.

17. GI-Fachtagung Informatik und Schule (INFOS) 2017.

### **Book chapters**

80. *Cryptography Basics.*

K.-T. Foerster and R. Wattenhofer.

In: Distributed Ledger Technology: The Science of the Blockchain (pp. 49-70), 2017.

81. *Quorum Systems.*

K.-T. Foerster and R. Wattenhofer.

In: Distributed Ledger Technology: The Science of the Blockchain pp. (87-104), 2017.

### **Posters at conferences**

82. *A Concept for an Introduction to Parallelization in Java: Multithreading with Programmable Robots in Minecraft.*

K.-T. Foerster.

Annual Conference of the ACM Special Interest Group for Information Technology Education (SIGITE), 2016.

83. *Programming in Scratch and Mathematics: Augmenting Your Geometry Curriculum, Today!*

K.-T. Foerster.

Annual Conference of the ACM Special Interest Group for Information Technology Education (SIGITE), 2015.

84. *Programming as an Everyday Tool in Mathematical Education.*

K.-T. Foerster.

13th International Congress on Mathematical Education (ICME) 2016.

### **Dissertations**

85. *Algorithmen und Programmierung im Geometrieunterricht der Klassenstufen 5 bis 7*

K.-T. Foerster. Advisor: B. Schmidt-Thieme (University of Hildesheim), 2020.

86. *Don't disturb my Flows: Algorithms for Consistent Network Updates in Software Defined Networks.*

K.-T. Foerster. Advisor: R. Wattenhofer (ETH Zurich), 2016.

### **Contributed articles and technical reports (non-refereed)**

87. *Scratch von Anfang an.*

K.-T. Foerster.

Beiträge zum Mathematikunterricht (BzMU) 2014. WTM-Verlag, Münster, pp. 373 - 376.

88. *The Solitaire Memory Game.*

K.-T. Foerster and R. Wattenhofer.

Technical Report, ETH Zurich, 2013.

89. *Die Programmiersprache Scratch in der Sekundarstufe I.*

K.-T. Foerster.

Beiträge zum Mathematikunterricht (BzMU) 2013. WTM-Verlag, Münster, pp. 316 - 319.

90. *Raumgeometrie mit Minecraft: Raumvorstellung und kreative Kooperation zu Beginn der Sekundarstufe I.*

K.-T. Foerster.

Beiträge zum Mathematikunterricht (BzMU) 2012. WTM-Verlag, Münster, pp. 273-276.

91. *Neue Möglichkeiten durch die Programmiersprache Scratch: Algorithmen und Programmierung für alle Fächer.*  
K.-T. Foerster.  
Beiträge zum Mathematikunterricht (BzMU) 2011. WTM-Verlag, Münster, pp. 262-266.

## TALKS

### Selected invited talks:

- *On Consistent Migration of Flows in Software-Defined Networks*  
Network Verification Group, Aalborg University, Denmark, (virtual), March 2021.
- *On Resilience in Networks by Local Fast Failover Routing*  
Séminaire Toulousain en Réseau, LAAS-CNRS, Toulouse, France, (virtual), January 2021.
- *On the Feasibility of Perfect Resilience with Local Fast Failover*  
Aalto CS Theory Seminar, Helsinki, Finland, (virtual), August 2020.
- *Towards Reconfigurable Optical Networks: Opportunities and Challenges.*  
Various talks in 2020, e.g., at TU Dortmund, U. Bamberg, TU Darmstadt, TU Munich, MPI and Saarland U., U. Wisconsin-Madison
- *Exciting Times ahead: Programming Network Topologies on the Fly.*  
School of Engineering and Applied Sciences, Harvard, Cambridge, USA, September 2019.
- *Preprocessing in Decentralized Network Optimization.*  
School of Information and Communication Engineering, UESTC, Chengdu, China, Dec. 2018.
- *On Scheduling Consistent Software-Defined Network Updates.*  
Dagstuhl Seminar 18101 on Scheduling, Schloss Dagstuhl, Germany, March 2018.
- *Waypoint Routing.*  
Department of Computer Science, Cornell University, USA, July 2018.
- *Understanding and Mitigating Packet Corruption in Data Center Networks.*  
Internet Network Architectures group, TU Berlin, Germany, June 2017.
- *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.
- *Nur was Du programmieren kannst, das hast Du verstanden!*  
Colloquium Mathematik im Mittelpunkt, University of Hildesheim, Germany, May 2017.
- *Moving Network Flows without Congestion: Different Models, different Complexities.*  
Department of Computer Science, Princeton University, Princeton, NJ, USA, June 2016.
- *Consistent Migration of Flows in SDNs.*  
HUAWEI France Research Center, Paris, France, June 2016.
- *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.
- *Local Checkability, No Strings Attached.*  
Theory of Distributed Systems Group, MIT, Cambridge, MA, USA, December 2015.
- *On the Computational Complexity of some Consistency Properties in SDNs.*  
Department of Computer Science, Princeton University, Princeton, NJ, USA, October 2015.
- *Lower and Upper bounds for Online Directed Graph Exploration.*  
7th workshop on GRAPh Searching, Theory and Applications (GRASTA-MAC 2015), Montréal, Canada, October 2015.

## Further recent talks at conferences/workshops:

- 2021:
  - SIAM APOCS: *On the Feasibility of Perfect Resilience with Local Fast Failover*
- 2020:
  - DISC: *What Can(not) Be Perfectly Rerouted Locally*
  - ACM SOSR: *OptFlow: A Flow-based Abstraction for Programmable Topologies*
  - 2. KuVS Fachgespräch "Network Softwarization": *Rate Adaptive Wide Area Network*
- 2019:
  - IEEE INFOCOM: *CASA: Congestion and Stretch Aware Static Fast Rerouting.*  
**Best in-session presentation award**
  - IEEE NCA: *Distributed Consistent Network Updates in SDNs: Local Verification for Global Guarantees.*
  - IFIP Networking: *Efficient Non-Segregated Routing for Reconfigurable Demand-Aware Networks.* **Best paper award**
  - IFIP Networking: *Latency and Consistent Flow Migration: Relax for Lossless Updates.*
  - ACM PODC: *Brief Announcement: Does Preprocessing Help under Congestion?*
- 2018:
  - IEEE/ACM ANCS: *Characterizing the Algorithmic Complexity of Reconfigurable Data Center Architectures.*
  - IEEE NCA: *On the Consistent Migration of Splittable Flows: Latency-Awareness and Complexities.*
  - LATIN: *Walking through Waypoints*
  - OPODIS: *Local Fast Segment Rerouting on Hypercubes.*
- 2017:
  - IEEE NCA: *On the Consistent Migration of Unsplittable Flows: Upper and Lower Complexity Bounds.*
  - IEEE EDUCON: *Teaching Spatial Geometry in a Virtual World: Using Minecraft in Mathematics in Grade 5/6.*
  - INFOS: *Vom Flaggenalphabet zur Vorratsdatenspeicherung: Schülerinnen und Schüler als Multiplikatoren technischer Aspekte der digitalen Welt.*
  - Highlights of Algorithms (HALG): *Local Checkability, No Strings Attached: (A)cyclicity, Reachability, Loop Free Updates in SDNs.*
- 2016:
  - ACM SIGITE: *Integrating Programming into the Mathematics Curriculum: Combining Scratch and Geometry in Grades 6 and 7.*
  - ICCCN: *The Power of Two in Consistent Network Updates: Hard Loop Freedom, Easy Flow Migration.*
  - ICDCN: *Local Checkability, No Strings Attached.*  
**Best paper award**
  - ICDCN: *Augmenting Anycast Network Flows.*
  - IEEE INFOCOM: *On Consistent Migration of Flows in SDNs.*  
**Best in-session presentation award**
  - IEEE NCA: *Reducing the Latency-Tail of Short-Lived Flows: Adding Forward Error Correction in Data Centers.*
  - Highlights of Algorithms (HALG): *On Consistent Migration of Flows in SDNs.*

## REFERENCES

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