

CONTACT INFORMATION	Computer Science Department Carnegie Mellon University 5000 Forbes Ave, Pittsburgh, PA 15213		phone: (412) 295 0485 email: dsberger@cmu.edu web: https://www.cs.cmu.edu/~dberger1/
EMPLOYMENT	7/2018 – 6/2019	Mark Stehlik Postdoctoral Teaching Fellow	Computer Science Department, Carnegie Mellon University, Pittsburgh, USA.
	12/2018 – 1/2019	Research Scientist	Facebook Inc., CacheLib Team, Menlo Park, USA.
	8/2017 – 7/2018	Project Scientist	Computer Science Department, Carnegie Mellon University, Pittsburgh, USA.
	2/2013 – 10/2013	Research Intern	Telekom Innovation Laboratories, Berlin, Germany.
	7/2008 – 6/2010	Research Assistant	German Cancer Research Center, Heidelberg, Germany.
EDUCATION	University of Kaiserslautern, Germany		
	2014 – 2018	Ph.D. in Computer Science	
		Thesis: <i>Design and Analysis of Adaptive Caching Techniques for Internet Content Delivery</i>	
		Committee: Jens Schmitt (Kaiserslautern), Mor Harchol-Balter (CMU), Florin Ciucu (U. Warwick)	
	2012 – 2014	M.Sc. in Computer Science	
		Thesis: <i>Towards Analytical Cache Models for Feedforward Networks</i>	
		Committee: Jens Schmitt (Kaiserslautern), Florin Ciucu (U. Warwick)	
	2009 – 2012	B.Sc. in Computer Science	
		Thesis: <i>Effects and Factors of Network Instability</i>	
		Committee: Jens Schmitt (Kaiserslautern), Martin Karsten (U. Waterloo)	
RESEARCH VISITS	2015, 2016, 2017	15 months, visiting scholar	Carnegie Mellon University, USA.
	2013	4 months, visiting scholar	Warwick University, UK.
	2012	6 months, M.Sc. program computer science	ETH Zurich, Switzerland.
	2011	6 months, visiting scholar	University of Waterloo, Canada.
HONORS AND AWARDS	<p>Co-wrote NSF-CSR Medium Collaborative Research Grant, PIs: Mor Harchol-Balter and Ramesh Sitaraman, Title: Foundations of Cache Network Operations for Content Delivery. Award No: 180341. Awarded September 2018. Medium: \$1,200,000.</p> <p>Co-wrote Microsoft Research Grant, PI: Mor Harchol-Balter, Title: Caching for Tail Latency, Microsoft Research. Awarded February 2018. \$30,000 + \$30,000 (in Azure cloud credit).</p> <p>Mark Stehlik Fellowship, Computer Science Department, Carnegie Mellon University. August 2017 to June 2019. \$125,000.</p> <p>German National M.Sc. Research Price, German Informatics Society. Technical committee on Measurements, Modeling and Evaluation of Computer Systems. April 2016.</p> <p>Best Paper Award at IFIP Performance, for “Exact Analysis of TTL Cache Networks”, International Federation for Information Processing. Working group on Computer System Modeling. October 2014.</p> <p>Best Student Paper Award at ACM WiSec, for “Gaining Insight on Friendly Jamming in a Real-World IEEE 802.11 Network”, ACM Special Interest Group on Security, Audit and Control. July 2014.</p> <p>Ph.D. Scholarship, State of Rhineland-Palatinate, Germany. 2014–2017. €84,000 (\approx \$93,000).</p> <p>German Academic Scholarship. The German Academic Scholarship Foundation is funded by the federal government of Germany and awards scholarships to the top 0.5% of German students. 2008 – 2013. €21,600 (\approx \$24,000).</p>		

D. S. Berger. “Towards Lightweight and Robust Machine Learning for CDN Caching”. In *ACM Hot-Nets*, pp. 134–140, November 2018.

D. S. Berger, B. Berg, T. Zhu, S. Sen, M. Harchol-Balter. “RobinHood: Tail Latency Aware Caching – Dynamic Reallocation from Cache-Rich to Cache-Poor”. In *USENIX OSDI*, pp. 195–212, October 2018.

D. S. Berger, N. Beckmann, M. Harchol-Balter. “Practical Bounds on Optimal Caching with Variable Object Sizes”. In *ACM SIGMETRICS*, pp. 32:1–32:38, June 2018.

Also appeared in *ACM POMACS*, vol. 2, issue 2, as article No. 32, June 2018.

D. S. Berger, R. Sitaraman, M. Harchol-Balter. “AdaptSize: Orchestrating the Hot Object Memory Cache in a CDN”. In *USENIX NSDI*, pp. 483–498, March 2017.

T. Zhu, **D. S. Berger**, M. Harchol-Balter. “SNC-Meister: Admitting More Tenants with Tail Latency SLOs”. In *ACM SoCC*, pp. 374–387, October 2016.

M. Karsten, **D. S. Berger**, J. Schmitt. “Traffic-Driven Implicit Buffer Management - Delay Differentiation Without Traffic Contracts”. In *International Teletraffic Congress*, pp. 44–52, September 2016.

D. S. Berger, S. Henningsen, F. Ciucu, J. Schmitt. “Maximizing Cache Hit Ratios by Variance Reduction”. In *ACM SIGMETRICS Workshop on Mathematical Performance Modeling and Analysis*, pp. 57–59, September 2016.

D. S. Berger, F. Gringoli, N. Facchi, I. Martinovic, J. Schmitt. “Friendly Jamming on Access Points: Analysis and Real-World Measurements”. *IEEE Transactions on Wireless Communications*, vol. 15, no. 9, pp. 6189–6202, June 2016.

D. S. Berger, P. Gland, S. Singla, F. Ciucu. “Exact Analysis of TTL Cache Networks”, In *IFIP Performance*, pp. 2–23, September 2014.

D. S. Berger, M. Karsten, J. Schmitt. “On the Relevance of Adversarial Queueing Theory in Practice”, In *ACM SIGMETRICS*, pp. 343–354, July 2014.

D. S. Berger, F. Gringoli, N. Facchi, I. Martinovic, J. Schmitt. “Gaining Insight on Friendly Jamming in a Real-World IEEE 802.11 Network”, In *ACM WiSec*, pp. 105–116, June 2014.

D. S. Berger, F. Ciucu. “Stochastic Bounds on Inter-Miss Times from TTL Caches”, *Praxis der Informationsverarbeitung und Kommunikation*, Vol 37(2), pp. 109–120, March 2014.

D. S. Berger, M. Karsten, J. Schmitt. “Simulation of Adversarial Scenarios in OMNeT++: Putting Adversarial Queueing Theory from Its Head to Feet”, *Proceedings of ICST Simutool*, pp. 291–298, October 2013.

POSTER PAPERS

J. Wang, **D. S. Berger**, B. Berg, S. Sen. “Maximizing Page-Level Cache Hit Ratios in Large Web Services”, poster at *ACM SIGMETRICS*, June 2018.

D. S. Berger, B. Berg, T. Zhu, M. Harchol-Balter. “The Case for Dynamic Cache Partitioning for Tail Latency”, poster at *USENIX NSDI*, March 2017.

M. Schäfer, **D. S. Berger**, V. Lenders, J. Schmitt. “Security By Mobility in Location and Track Verification”, poster at *ACM WiSec*, Article No. 29, June 2015.

F. Gringoli, N. Facchi, **D. S. Berger**. “A testbed to evaluate frequency-hopping anti-jamming techniques in IEEE 802.11”, poster at *ACM WiNTECH*, pp. 85–88, September 2014.

D. S. Berger, P. Gland, S. Singla, F. Ciucu. “Exact Analysis of TTL Cache Networks: The Case of Caching Policies driven by Stopping Times”, poster at *ACM SIGMETRICS*, pp. 595–596, June 2014.

At Carnegie Mellon University**15-440, 15-640: Distributed Systems**

Intensive distributed systems class for undergraduate and MS students. Twice-weekly lectures, 3-4 implementation-heavy multi-week projects spanning concurrency, caching, scheduling, scalability, imperfect communication, and fault-tolerance. (180 students.)

Spring 2019	Co-taught with Mahadev Satyanarayanan and Padmanabhan Pillai
Fall 2018	Co-taught with Yuvraj Agarwal Daniel's Teaching Evaluation: 4.65/5
Spring 2017	Co-taught with Mahadev Satyanarayanan and Padmanabhan Pillai Daniel's Teaching Evaluation: 4.61/5
Fall 2017	Co-taught with Srinivasan Seshan and Yuvraj Agarwal Daniel's Teaching Evaluation: 4.67/5

At University of Kaiserslautern**89-4245: Performance Evaluation of Distributed Systems**

Developed course on applied performance evaluation. Weekly lecture and 3-months-long student project, one-on-one instructions. (10 students.)

Fall 2016	Co-taught with Matthias Schaefer (PhD student).
Fall 2015	Co-taught with Matthias Schaefer (PhD student).
Winter 2015	Co-taught with Matthias Schaefer (PhD student).

At University of Kaiserslautern

Fall 2014	89-4271: Mobile Computing.
Fall 2013	89-4111: Distributed and Networked Systems.
Winter 2010	89-0013: Computer Networks.

MS Researchers Supervised

1. Huzaifa Abbasi, current student at CMU
2. Utkarsh Agarwal, current student at CMU
3. Rong Huang, graduated with MS from CMU in 2018
4. Ruogu Du, graduated with MS from CMU in 2018
5. Justin Wang, graduated with MS from CMU in 2018
6. Qiunan Liu, graduated with MS from CMU in 2018
7. Meng Li, graduated with MS from CMU in 2018
8. Wenqi Mou, graduated with MS MS from CMU in 2018
9. Yuqing Miao, graduated with MS MS from CMU in 2018
10. Jin Zhang, graduated with MS MS from CMU in 2018
11. Sebastian Henningsen, graduated with MS in 2015, pursuing Ph.D. at HU Berlin

Undergraduate Researchers Supervised

1. Tanuj Nayak, current student at CMU
2. Madox Summermatter, current student at CMU
3. Sandor Dalecke, graduated with B.Sc. in 2017
4. Wadim Micheew, graduated with B.Sc. in 2017
5. Philipp Schon, graduated with B.Sc. in 2015

- 2019 “Tail Latency Meets Caching: An Unusual Alliance”, **Microsoft Research**, Seattle, April 2019 (hosted by Landon Cox).
- “Tail Latency Meets Caching: An Unusual Alliance”, **Stony Brook University**, Departmental Seminar, Stony Brook, New York, March 2019 (hosted by Aruna Balasubramanian).
- “Understanding optimal caching in web apps, storage, and at the edge”, **Princeton University**, *S** Network Systems (SNS) group, Princeton, March 2019 (hosted by Wyatt Lloyd and Kai Li).
- “Tail Latency Meets Caching: An Unusual Alliance”, **Microsoft Research**, Research Seminar, New York City, February 2019 (hosted by Siddhartha Sen).
- “Tail Latency Meets Caching: An Unusual Alliance”, **Pennsylvania State University**, Departmental Seminar, State College, February 2019 (hosted by Timothy Zhu).
- 2018 “RobinHood: Tail Latency-Aware Caching”, **University of Washington**, Seattle, November 2018 (hosted by Arvind Krishnamurthy).
- “RobinHood: Tail Latency-Aware Caching”, **UC Berkeley**, NetSys Seminar, Berkeley, October 2018 (hosted by Scott Shenker).
- “RobinHood: Tail Latency-Aware Caching”, **Stanford University**, Platform Lab Seminar, Stanford, October 2018 (hosted by Sachin Katti).
- “RobinHood: Tail Latency-Aware Caching”, **MIT**, CSAIL Seminar, Boston, September 2018 (hosted by Frans Kaashoek).
- “Towards Tail Latency-Aware Caching in Large Web Services”, **Red Hat, Hariri Institute**, Red Hat Colloquium, Boston, September 2018 (hosted by Azer Bestavros).
- “Towards Tail Latency-Aware Caching in Large Web Services”, **Pennsylvania State University**, CS Seminar, State College, August 2018 (hosted by Timothy Zhu).
- “Towards Tail Latency-Aware Caching in Large Web Services”, **Columbia University**, New York City, August 2018 (hosted by Vishal Misra and Ethan Katz-Bassett).
- “Towards Tail Latency-Aware Caching in Large Web Services”, **Google**, Sunnyvale, June 2018 (hosted by Mustafa Uysal and Arif Merchant).
- “Towards Tail Latency-Aware Caching in Large Web Services”, **Facebook**, Menlo Park. June 2018 (hosted by Huapeng Zhou).
- “Pushing the limits for CDN first level cache hit ratios”, **Verizon Digital Media Services**, Los Angeles, June 2018 (hosted by Bedi Harkeerat).
- 2017 “Can caching be used to resolve data center load imbalances?”, **Microsoft Research**, New York City, September 2017 (hosted by Siddhartha Sen).
- “Can caching be used to resolve data center load imbalances?”, **The New York Times Tech Lab**, New York City, April 2017 (hosted by Justin Heideman).
- “Orchestrating the Hot Object Cache in a CDN”, **Google**, Cambridge/Boston. March 2017 (hosted by Ken Barr).
- “Orchestrating the Hot Object Cache in a CDN”, **University of Massachusetts**, Amherst. March 2017 (hosted by Ramesh Sitaraman).
- 2016 “Maximizing Cache Hit Ratios of CDN Memory Caches with Adaptive Size-Aware Admission Control”, **Facebook**, Menlo Park. October 2016 (hosted by Lukasz Wesolowski).

“Maximizing Cache Hit Ratios of CDN Memory Caches with Adaptive Size-Aware Admission Control”, SDI/ISTC seminar, **Intel Science and Technology Center**, Pittsburgh. September 2016.

“Towards Analytical Cache Models for Feedforward Networks.” GI/ITG Conference on Measurement, Modeling and Evaluation of Computing Systems, Münster, Germany. April 2016.

2015 “New mathematical techniques for the analysis of TTL caches.” Probability seminar, Division of Applied Mathematics, **Brown University**, Providence. May 2015 (hosted by Kavita Ramanan).

“New mathematical techniques for the analysis of TTL caches.” SQUALL seminar series, School of Computer Science, **Carnegie Mellon University**, Pittsburgh. April 2015 (hosted by Mor Harchol-Balter).

“Rambling Thoughts on Cache Attacks.” Cyber Alp Retreat, **Federal Department of Defense of Switzerland** (armasuisse), Meiringen, Switzerland. January 2015.

2014 “A Practical Perspective on Adversarial Queueing Theory.” NDS seminar series, David R. Cheriton School of Computer Science, **University of Waterloo**, Waterloo, Canada. May 2015 (hosted by Martin Karsten).

SERVICE

As Reviewer

ACM Transactions on Modeling and Performance Evaluation of Computing Systems (2018), IEEE Journal on Selected Areas in Communications (2018), IEEE/ACM Transactions on Networking (2016, 2017, 2018), Performance Evaluation (2014, 2015, 2018), ACM Transactions on Storage (2016), IEEE Transactions on Mobile Computing (2016), Computer Networks (2016)

As External Reviewer

ACM SIGMETRICS (2017, 2018), USENIX NSDI (2018), ACM SoCC (2017), IEEE INFOCOM (2013-2017), IFIP Networking (2016), MobiHoc (2015), Valuetools (2013-2015), ITC (2014), RTSS (2013).

REFERENCES

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