Arpan Gujarati

Assistant Professor, CS, UBC, Vancouver

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Education

2014–2020 **Ph.D. in Computer Science (*Summa Cum Laude*)**
Max Planck Institute for Software Systems (MPI-SWS), Saarbrücken/Kaiserslautern, Germany and Technical University of Kaiserslautern (TU-KL), Kaiserslautern, Germany
Advisor: Björn B. Brandenburg (tenured faculty, head of the Real-Time Systems Group, MPI-SWS)
Thesis: *Towards "Ultra-Reliable" CPS: Reliability Analysis of Distributed Real-Time Systems* (submitted in December 2019, defended in October 2020)

2012–2014 **Preparatory Phase (Graduate Coursework)**
Max Planck Institute for Software Systems (MPI-SWS), Saarbrücken/Kaiserslautern, Germany and Saarland University (UdS), Saarbrücken, Germany

2007–2011 **B.E. (Hons.) in Computer Science**
Birla Institute of Technology and Science (BITS), Pilani, India

Work Experience

2023– **Tenure-Track Assistant Professor**
Computer Science Department, University of British Columbia (UBC), Vancouver, Canada
Focus areas: Cyber-physical systems, real-time systems, distributed systems

2021–2023 **Research Associate**
Computer Science Department, University of British Columbia (UBC), Vancouver, Canada
Manager: Margo Seltzer
Focus areas: Securing industrial cyber-physical systems like robotic arms; specifically, self-driving laboratories in the Hein Lab in the Chemistry department at UBC

2022 **Sessional Lecturer (six months)**
Electrical and Computer Engineering Dept., University of British Columbia (UBC), Vancouver, Canada
Focus areas: Teaching Real-Time System Design (CPEN 432)

2020–2021 **Postdoctoral Researcher**
Max Planck Institute for Software Systems (MPI-SWS), Saarbrücken/Kaiserslautern, Germany
Advisor: Jonathan Mace
Focus areas: Building efficient systems for deep neural network inference serving in cloud

2020 **Visiting International Research Student (VIRS) (one month)**
Electrical and Computer Engineering Dept., University of British Columbia (UBC), Vancouver, Canada
Hosts: Sathish Gopalakrishnan and Karthik Pattabiraman
Focus areas: Building reliable machine learning frameworks for resilient intelligence at the edge

2012–2019 **Graduate Research Assistant**
Max Planck Institute for Software Systems (MPI-SWS), Saarbrücken/Kaiserslautern, Germany
Advisor: Björn B. Brandenburg
Focus areas: Scheduling and fault-tolerance in real-time systems

2015 **Research Intern (three months)**
Microsoft Research, Redmond, WA, USA
Mentors: Kathryn S. McKinley, Sameh Elnikety, Yuxiong He
Focus areas: Distributed autoscaling of machine learning inference services

2011–2012 **Software Development Engineer**
Cloud Networking Group, Citrix R&D, Bengaluru, India
Manager: Sanjay Gupta
Focus areas: Management Service VM for the Xen Server

2011 **Software Development Intern (six months)**
Visual and Parallel Computing Group, Intel, Bengaluru, India
Team: Display Features and Miniport
Focus areas: Prototype code optimizations for kernel-mode graphics drivers

Honors and Awards

Dagsthul '25 **Invited to attend Dagsthul seminar 25091**
on Tradeoffs in Reactive Systems Design

RTSS '23 **Best Reviewer Award**
44th IEEE Real-Time Systems Symposium

Dagsthul '23 **Invited to attend Dagsthul seminar 23341**
on Functionally Safe Multi-Core Systems

RTSS '22 **Best Paper Award**
43rd IEEE Real-Time Systems Symposium

QRS '21 **Best Paper Award**
21st IEEE International Conference on Software, Quality, Reliability, and Security

SIGBED '21 **Paul Caspi Memorial Dissertation Award**
ACM Special Interest Group on Embedded Systems

SYSTOR '21 **Distinguished Reviewer Award**
14th ACM International System and Storage Conference

OSDI '20 **Distinguished Artifact Award**
14th USENIX Symposium on Operating Systems Design and Implementation

RTAS '20 **Distinguished Paper Award**
26th IEEE Real-Time and Embedded Technology and Applications Symposium

ECRTS '18 **Best Presentation Award**
30th Euromicro Conference on Real-Time Systems

Middleware '17 **Best Student Paper Award**
18th ACM/IFIP/USENIX International Middleware Conference

HLF '14 **Young Researcher**
2nd Heidelberg Laureate Forum

ECRTS '13 **Outstanding Paper Award**
25th Euromicro Conference on Real-Time Systems

Professional Activities

Co-chair

RAGE Real-time And intelliGent Edge computing workshop (2025)

RTSS-BP Real-Time Systems Symposium Brief Presentations Track (2023)

Technical Program Committee

EuroSys European Conference on Computer Systems (2026)

OSPERT Workshop on Operating Systems Platforms for Embedded Real-Time applications (2025)

RTCSA International Conference on Embedded and Real-Time Computing Systems and Applications (2025)

ECRTS Euromicro Conference on Real-Time Systems (2023, 2025)

ASPLOS International Conference on Architectural Support for Programming Languages and Operating Systems (2025)

RTAS Real-Time and Embedded Technology and Applications Symposium (2022, 2025)

EMSOFT International Conference on Embedded Software (2024)

Middleware International Middleware Conference (2023)

RTSS Real-Time Systems Symposium (2021, 2022, 2023)

SYSTOR International Systems and Storage Conference (2021, 2022)

ICDCS International Conference on Distributed Computing Systems (2021)

Journal Reviewer

TCPS ACM Transactions on Cyber-Physical Systems (2025)

RTS Real-Time Systems: The International Journal of Time-Critical Computing Systems (2022)

JSys Journal of Systems Research (2021, 2023)

TECS ACM Transactions on Embedded Computing Systems (2019, 2020)

TDSC IEEE Transactions on Dependable and Secure Computing (2019)

Peer-Reviewed Publications

Conference Publications

DSN '25 **ReMIX: Resilience for ML Ensembles using XAI at Inference against Faulty Training Data**
Abraham Chan, Arpan Gujarati, Karthik Pattabiraman, and Sathish Gopalakrishnan
55th IEEE/IFIP International Conference on Dependable Systems and Networks, Brisbane, Ausrtalia

SAC '25 **D-semble: Efficient Diversity-Guided Search for Resilient ML Ensembles**
Abraham Chan, Arpan Gujarati, Karthik Pattabiraman, and Sathish Gopalakrishnan
40th ACM/SIGAPP Symposium On Applied Computing, Catania, Sicily, Italy

RTSS '24 **Response-Time Analysis of a Soft Real-time NVIDIA Holoscan Application**
Philip Schowitz, Soham Sinha, and Arpan Gujarati
45th IEEE Real-Time Systems Symposium, York, UK

DSN '24 **RABIT, a Robot Arm Bug Intervention Tool for Self-Driving Labs**
Zainab Saeed Wattoo, Petal Vitis, Ruizhe Zhu, Noah Depner, Ivory Zhang, Jason Hein, Arpan Gujarati, and Margo Seltzer
54th IEEE/IFIP International Conference on Dependable Systems and Networks, Brisbane, Ausrtalia

ISSRE '23 **Evaluating the Effect of Common Annotation Faults on Object Detection Techniques**
Abraham Chan, Arpan Gujarati, Karthik Pattabiraman, and Sathish Gopalakrishnan
34th IEEE International Symposium on Software Reliability Engineering, Florence, Italy

RTSS '22 **In-ConcReTeS: Interactive Consistency meets Distributed Real-Time Systems, Again!**
Arpan Gujarati, Ningfeng Yang, and Björn B. Brandenburg
43rd IEEE Real-Time Systems Symposium, Houston, USA

DSN '22 **Arming IDS Researchers with a Robotic Arm Dataset**
Arpan Gujarati, Zainab Saeed Wattoo, Maryam Aliabadi, Sean Clark, Xiaoman Liu, Parisa Shiri, Amee Trivedi, Ruizhe Zhu, Jason Hein, and Margo Seltzer
52nd IEEE/IFIP International Conference on Dependable Systems and Networks, Baltimore, USA

DSN '22 **The Fault in Our Data Stars: Studying Mitigation Techniques against Faulty Training Data in ML Applications**
Abraham Chan, Arpan Gujarati, Karthik Pattabiraman, and Sathish Gopalakrishnan
52nd IEEE/IFIP International Conference on Dependable Systems and Networks, Baltimore, USA

QRS '21 **Understanding the Resilience of Neural Network Ensembles against Faulty Training Data**
Abraham Chan, Niranjhana Narayanan, Arpan Gujarati, Karthik Pattabiraman, and Sathish Gopalakrishnan
21st IEEE International Conference on Software, Quality, Reliability, and Security

OSDI '20 **Serving DNNs like Clockwork: Performance Predictability from the Bottom Up**
Arpan Gujarati, Reza Karimi, Safya Alzayat, Wei Hao, Antoine Kaufmann, Ymir Vigfusson, and Jonathan Mace
14th USENIX Symposium on Operating Systems Design and Implementation

RTAS '20 **Real-Time Replica Consistency over Ethernet with Reliability Bounds**
Arpan Gujarati, Sergey Bozhko, and Björn B. Brandenburg
26th IEEE Real-Time and Embedded Technology and Applications Symposium

ECRTS '19 **From Iteration to System Failure: Characterizing the FITness of Periodic Weakly-Hard Systems**
Arpan Gujarati, Mitra Nasri, Rupak Majumdar, and Björn B. Brandenburg
31th Euromicro Conference on Real-Time Systems, Stuttgart, Germany

ECRTS '18 **Quantifying the Resiliency of Fail-Operational Real-Time Networked Control Systems**
Arpan Gujarati, Mitra Nasri, and Björn B. Brandenburg
30th Euromicro Conference on Real-Time Systems, Barcelona, Spain

EuroSys '18 **Tableau: A High-Throughput and Predictable VM Scheduler for High-Density Workloads**
Manohar Vanga, Arpan Gujarati, and Björn B. Brandenburg
13th European Conference on Computer Systems, Porto, Portugal

Middleware '17 **Swayam: Distributed Autoscaling to Meet SLAs of Machine Learning Inference Services with Resource Efficiency**
Arpan Gujarati, Sameh Elnikety, Yuxiong He, Kathryn S. McKinley, and Björn B. Brandenburg
18th ACM/IFIP/USENIX International Middleware Conference, Las Vegas, USA

RTSS '15 **When is CAN the Weakest Link? A Bound on Failures-In-Time in CAN-Based Real-Time Systems**
Arpan Gujarati and Björn B. Brandenburg
36th IEEE Real-Time Systems Symposium, San Antonio, USA

RTSS '14 **Linux's Processor Affinity API, Refined: Shifting Real-Time Tasks towards Higher Schedulability**
Felipe Cerqueira, Arpan Gujarati, and Björn B. Brandenburg
35th IEEE Real-Time Systems Symposium, Rome, Italy

ECRTS '13 **Schedulability Analysis of the Linux Push and Pull Scheduler with Arbitrary Processor Affinities**
Arpan Gujarati, Felipe Cerqueira, and Björn B. Brandenburg
25th Euromicro Conference on Real-Time Systems, Paris, France

Journal Publications

RTS '18 **Correspondence Article: A Correction of the Reduction-Based Schedulability Analysis for APA Scheduling**
Arpan Gujarati, Felipe Cerqueira, Björn B. Brandenburg, and Geoffrey Nelissen
Real-Time Systems, August 2018

RTS '15 **Multiprocessor Real-Time Scheduling with Arbitrary Processor Affinities: From Practice to Theory**
Arpan Gujarati, Felipe Cerqueira, and Björn B. Brandenburg
Real-Time Systems, Volume 51, Issue 4, pp. 440–483. Springer Verlag, 2015

Workshop Publications

Disrupt '24 **Harnessing Explainability to Improve ML Ensemble Resilience.**
Abraham Chan, Arpan Gujarati, Karthik Pattabiraman, and Sathish Gopalakrishnan
Disruptive Ideas and New Interdisciplinary Results Track at the 54th IEEE/IFIP International Conference on Dependable Systems and Networks, Brisbane, Australia

WoSoCER '20 **New Wine in an Old Bottle: N-Version Programming for Machine Learning Components**
Arpan Gujarati, Sathish Gopalakrishnan, and Karthik Pattabiraman,
10th IEEE International Workshop on Software Certification

CERTS '18 **Using Schedule-Abstraction Graphs for the Analysis of CAN Message Response Times**
Mitra Nasri, Arpan Gujarati, and Björn B. Brandenburg
3rd Workshop on Security and Dependability of Critical Embedded Real-Time Systems, Luxembourg