**Microsoft**

Research
Faculty Summit 2018

Systems | Fueling future disruptions

Conference Guide
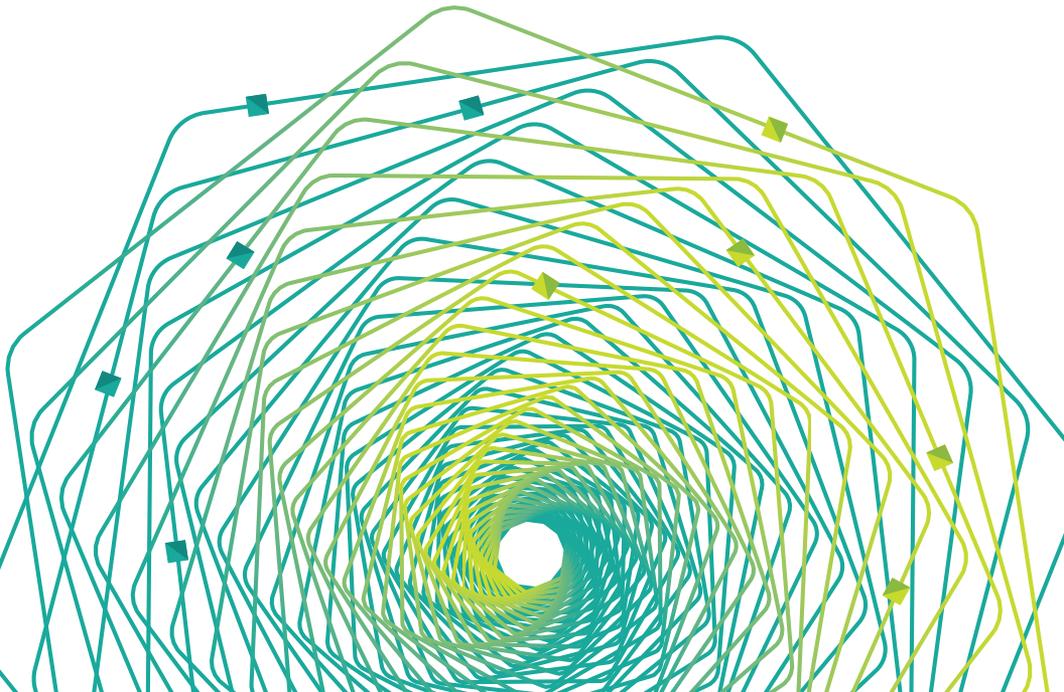
Welcome

Dear Colleagues,

Welcome to the 2018 Microsoft Research Faculty Summit! We are extremely excited about this, our nineteenth annual Faculty Summit. As in past years, we look forward to the lively exchange of ideas as we delve into broad, open challenges in Systems computing. Central to this year's theme— Systems | Fueling Future Disruptions—the summit will present cutting-edge technology and research from Microsoft product and research groups.

This program is designed to create dialog in a breadth of topic areas. In addition to examining Systems from many directions, the program includes sessions on such wide-ranging topics as the Intelligent Edge, where IoT and the cloud converge for low latency applications, self-tuning AI systems, and not just quantum computers, but quantum systems. Plus, the exploration of confidential computing, and trends in blockchain technologies.

The Microsoft Research Faculty Summit is one of those rare opportunities to network with leading researchers from around the globe. We hope you enjoy the chance to broaden your engagement across this rich field, as well as all the Microsoft employees and researchers that will be attending.

Whether this is your first Research Faculty Summit or you've been here before, we think you'll be inspired by the breadth of expertise and diversity of perspectives among your fellow attendees.

On behalf of the Microsoft team, we would like to personally thank you for joining us this year.

Warm regards,

Dan Fay
Research Faculty Summit Co-Chair
Senior Director,
Microsoft Research

Donald Kossmann
Research Faculty Summit Co-Chair
Distinguished Scientist and Director of
Redmond Lab, Microsoft Research

Wednesday, August 1

7:30–8:30	**Breakfast**	MCKINLEY

8:30–9:00	**Welcome and Introduction**	KODIAK
	Sandy Blyth, Managing Director, Microsoft Research; Donald Kossmann, Director of Redmond Lab, Microsoft Research	

9:00–10:00	**Inside Microsoft Azure Datacenter Architecture**	KODIAK
	Mark Russinovich, Chief Technology Officer, Microsoft Azure	

10:00–10:15 **Transition Break**

Breakout Sessions

10:15–11:45	**Database and Data Analytic Systems**	CASCADE
	Chair: Surajit Chaudhuri	
	Speakers: Tim Kraska, Andy Pavlo, Matei Zaharia	

10:15–11:45	**Hardware-accelerated Networked Systems**	RAINIER
	Co-Chairs: Yibo Zhu and Hitesh Ballani	
	Speakers: Tom Anderson, Hitesh Ballani, Daniel Blumenthal, Sambhrama Mundkur	

10:15–11:45	**Verification and Secure Systems**	ST. HELENS
	Chair: Chris Hawblitzel	
	Speakers: Adam Chlipala, Ed Nightingale, Nikhil Swamy	

11:45–1:00 **Networking Lunch: One Table / One Topic** MCKINLEY

Breakout Sessions

1:00–2:30	**Free Inference and Instant Training: Breakthroughs and Implications**	CASCADE
	Co-Chairs: Matthai Philipose and Amar Phanishayee	
	Speakers: Geoff Gordon, Michael Jordan, Christopher Re, Vivienne Sze	

1:00–2:30	**Future of Cloud Storage Systems**	RAINIER
	Chair: Ant Rowstron	
	Speakers: Luis Ceze, Aaron Ogus, Ant Rowstron, Steven Swanson	

1:00–2:30	**AI for AI Systems**	ST. HELENS
	Co-Chairs: Debadeepta Dey and Dan Bohus	
	Speakers: Behnaz Arzani, Eric Horvitz, Virginia Smith	

2:30–3:00	**Networking Break**	

	Breakout Sessions	
3:00–4:15	**The Good, the Bad, and the Ugly of ML for Networked Systems** Co-Chairs: Ganesh Ananthanarayanan, Junchen Jiang, Venkat Padmanabhan, and Siddhartha Sen Speakers: Bruce Maggs, Dave Maltz, Balaji Prabhakar, Keith Winstein	CASCADE
3:00–4:15	**Programmable Hardware for Distributed Systems** Chair: Dan Ports Speakers: Simon Peter, Dan Ports	RAINIER
3:00–4:15	**Continuous Deployment: Current and Future Challenges** Chair: Brendan Murphy Speakers: Chap Alex, Jen Beckmann, Laurie Williams	ST. HELENS

4:15–4:30	**Transition Break**	

| 4:30–5:05 | **Entrepreneurship and Systems Research**
Moderator: Ranveer Chandra, Principal Researcher, Microsoft Research

Panelists: Dawn Song, Professor, University of California, Berkeley; Matei Zaharia, Assistant Professor, Stanford University and Co-founder, Databricks | KODIAK |
| 5:05–5:45 | **The Art of Building a Reliable Cloud Network**
Albert Greenberg, Corporate Vice President, Microsoft Azure Networking | KODIAK |

6:00–6:30	**Travel to Dinner**	

6:30–9:00	**Lakeside Barbeque at Hyatt Regency Lake Washington**	

Thursday, August 2

7:30–8:30	**Breakfast**	MCKINLEY

8:30–9:00	**Technology Showcase - Lightning Round**	KODIAK
	Sandy Blyth, Global Managing Director, Microsoft Research	

9:00–9:45	**Knowledge Systems and AI**	KODIAK
	David Ku, Corporate Vice President, Microsoft Artificial Intelligence & Research	

9:45–10:00	**Transition Break**	

Breakout Sessions

10:00–11:30	**Intelligent Edge**	ST. HELENS
	Chair: Victor Bahl Speakers: Mung Chiang, Umakishore Ramachandran, Arjmand Samuel, Lin Zhong	

10:00–11:40	**Confidential Computing**	RAINIER
	Chair: Manuel Costa Speakers: Srini Devadas, Peter Pietzuch, Mark Russinovich, Dawn Song	

10:00–12:00	**CPU & DRAM Bugs: Attacks & Defenses**	CASCADE
	Co-Chairs: Stefan Saroiu and Alec Wolman Speakers: Margaret Martonosi, Christopher Ertl, Onur Mutlu	

11:30–2:00	**Technology Showcase**	HOOD/ BAKER
	Chair: Sean Kuno, Research Program Manager, Microsoft Research	

12:00–1:00	**Networking Lunch: One Table / One Topic**	MCKINLEY

Breakout Sessions

1:00–1:30	**Micro Co-design for Efficient Cloud Infrastructure**	LASSEN
	Speaker: Muthian Sivathanu	

1:30–2:00	**From Paper to Production: Privacy Compliance Systems at Scale**	LASSEN
	Speaker: Saikat Guha	

Breakout Sessions

2:00–3:15	**Quantum Computers: Software and Hardware Architecture** Chair: Matthias Troyer Speakers: Douglas Carmean, Torsten Hoefler, Margaret Martonosi	CASCADE
2:00–3:15	**AI Infrastructure and Tools** Speakers: Yang Fan, Ming Wu	RAINIER
2:00–3:15	**Current Trends in Blockchain Technology** Chair: Arvind Arasu Speakers: Carsten Binnig, Srinath Setty, Dawn Song	ST. HELENS
3:15–3:45	**Networking Break**	
3:45–4:30	**Computing Innovation and Diversity of Thought** Chair: Vani Mandava, Director, Data Science, Microsoft Research Moderator: Lucy Sanders, CEO and Co-founder of the National Center for Women & Information Technology Panelists: Abolade Gbadegesin, Distinguished Engineer, Microsoft; Jim Kurose, Assistant Director, National Science Foundation; Margaret Martonosi, Professor of Computer Science, Director, Keller Center for Innovation in Engineering Education, Princeton University	KODIAK
4:30–5:15	**Systems Research	Fueling Future Disruptions** Donald Kossmann, Director of Redmond Lab, Microsoft Research	KODIAK

Technology Showcase

1. Platform for Situated Intelligence

2. High-Fidelity Network Validation for C

3. Receptionist Assistant Robot – Strategic Prototyping Team

4. Resource Central: Toward Intelligent Clouds

5. Prometheus: Co-Designing Distributed Systems and Datacenter Hardware

6. FaRM

7. Optical Networking Innovation at Microsoft

8. Project Fiddle

9. Azure Confidential Computing

10. AI for Earth –Species Recognition APIs

11. The Seven Properties of Highly Secured Devices

12. OpenPAI: Open Source Initiative for AI Platform in China

13. COCO: Confidential Consortium Blockchains

14. Confidential AI: Secure Multi-party Artificial Intelligence

15. Empowering the Quantum Revolution with Q#

16. Private Compute

17. FarmBeats: Empowering Farmers with Low-Cost Digital Agriculture Solutions

18. Project Kinect for Azure Depth Sensor Technology Demo

19. High Fidelity Simulations: The Critical Path to Real-World AI

Pop-up Kiosks

Visit the pop-up kiosks, which will change throughout the day, to learn about new academic programs, technologies, and more.

One Table/One Topic

Join Distinguished Engineers and Distinguished Scientists for an informal roundtable discussion at lunch on Wednesday, August 1. Each table will cover a designated topic hosted by Microsoft experts.

Map

Microsoft Conference Center
Building 33

Cascade

Kodiak

Speaker Desk

St. Helens

Rainier

Restrooms

Business Center

Lassen

Sonora

Restrooms

Pop-up Kiosks

↓ Entrance

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Hood/Baker

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Registration

Main Entrance ↑

McKinley

Restrooms
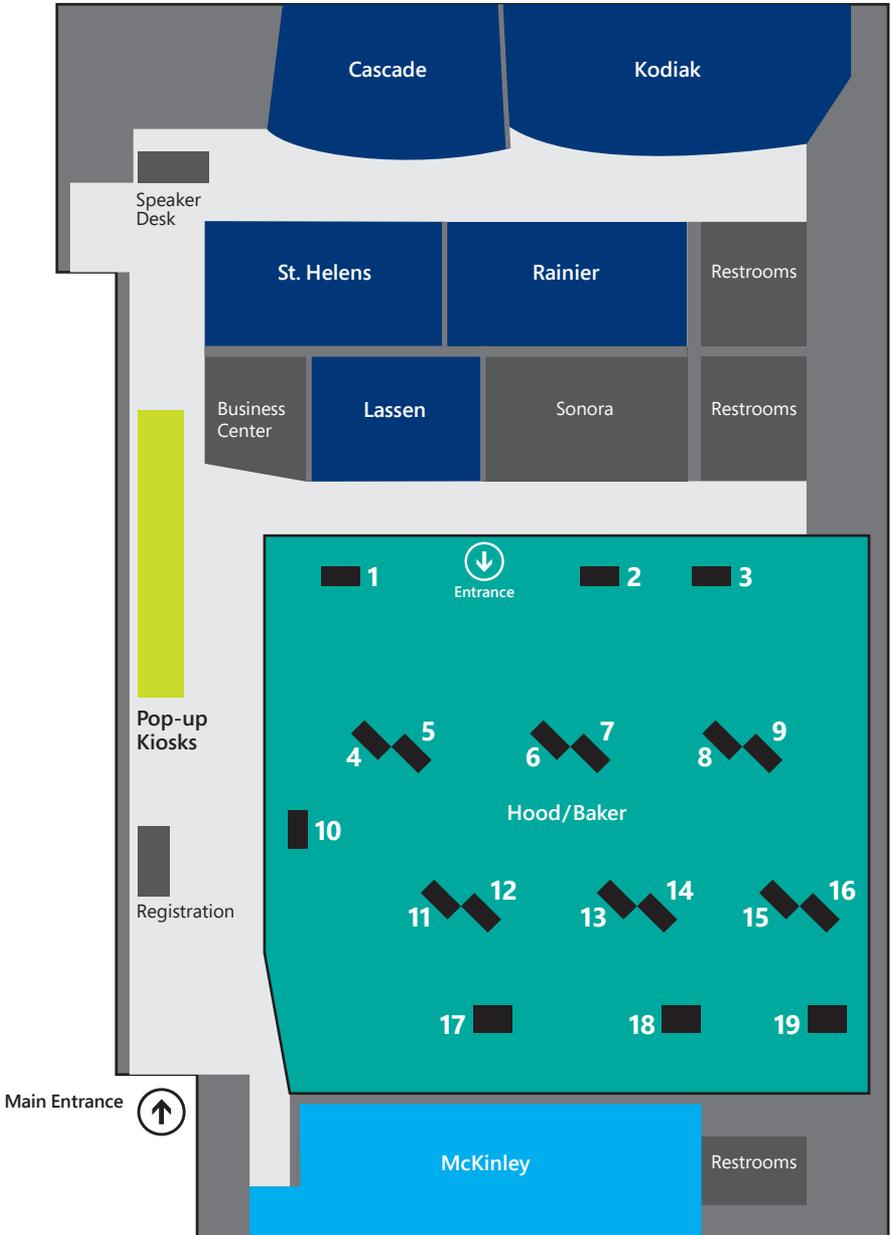
Microsoft Research

Where leading minds in technology research tackle
complex problems to improve lives.
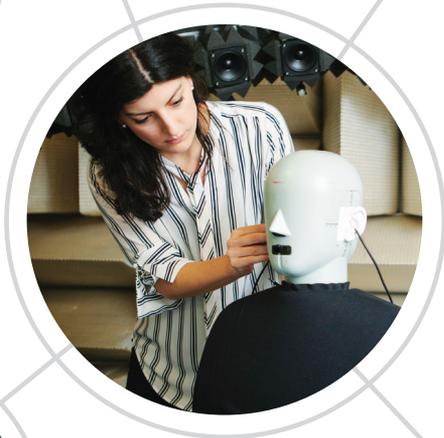
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