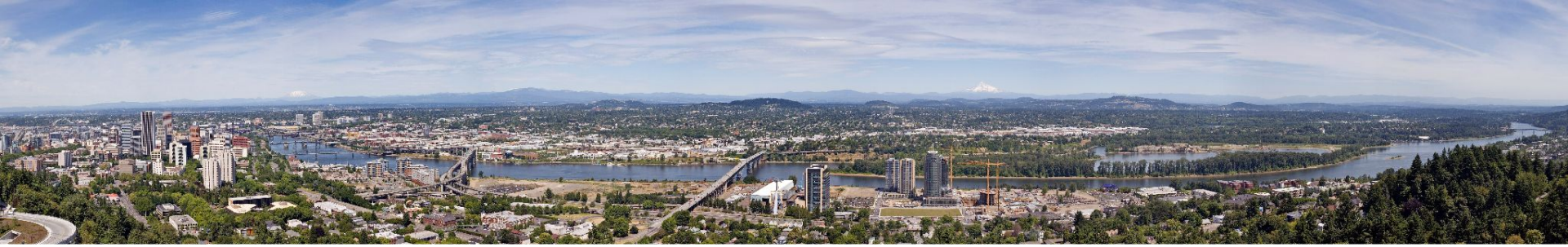
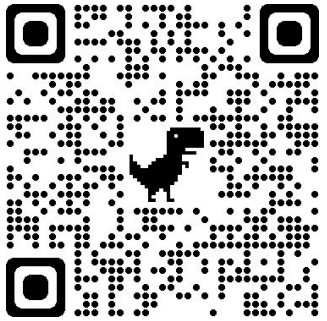


PAISE 2021

3rd Workshop on
Parallel **AI** and **S**ystems for the **E**dge

https://paise.org
Friday, May 21st 2021

PAISE 2021 in a Nutshell



- Opening and Keynote (UTC 14:30 - 15:30 (60 min))

  Break 1
- 4 paper talks (UTC 15:45 - 17:20 (95 min))

  Break 2
- Panel on Edge computing (UTC 17:35 - 18:55 (80 min))

  Break 3
- 3 Paper talks and closing remarks (UTC 19:10 - 20:30 (80 min))

Program Committee

- Paarijaat Aditya, Nokia Bell Labs
- Istemi Ekin Akkus, Nokia Bell Labs
- Marco Brocanelli, Wayne State University
- Kevin Chan, Army Research Laboratory
- Ruichuan Chen, Nokia Bell Labs
- Lucy Cherkasova, ARM Research
- Nirmit V Desai, IBM Research
- Nicolas Erdody, Open Parallel
- Nicola Ferrier, Argonne National Laboratory
- Felipe M. G. França, Universidade Federal do Rio de Janeiro (UFRJ)
- Dennis Gannon, Indiana University Bloomington
- Dawei Li, Amazon Inc.
- Diego Lugones, Nokia Bell Labs
- Eric Van Hensbergen, ARM Research
- Eric Matson, Purdue University
- Leandro Marzulo, Google LLC
- Michael Papka, Northern Illinois University
- Koichi Shinoda, Tokyo Institute of Technology
- Jerry Trahan, Louisiana State University
- Sean Shahkarami, University of Chicago
- Ramachandran Vaidyanathan, Louisiana State University
- Wei Wang, The Hong Kong University of Science and Technology
- Feng Yan, University of Nevada, Reno
- Kazutomo Yoshii, Argonne National Laboratory

Special thanks also to IPDPS organizers, particularly the Workshop Chairs, proceedings chairs, and Sally Jelinek Westrom for helping with all the logistics!

Thank you!

Plan for the day ...

- The **keynote** will be presented **live**. Please type your questions in the chat window, the moderators will ask them at the end of the presentation.

- The **paper talks** are all **pre-recorded**. Questions and discussions through chat during the talk, followed by a 5 mins live Q&A. We request the authors to unmute themselves and turn their video on for the Q&A during which the moderators will ask the questions entered into the chat window.

- The **panel** will start off with some seed questions, and audience is encouraged to participate actively. You are welcome to type your questions for the panel in the chat or unmute and ask your question.

- Please keep your mic muted at all other times.

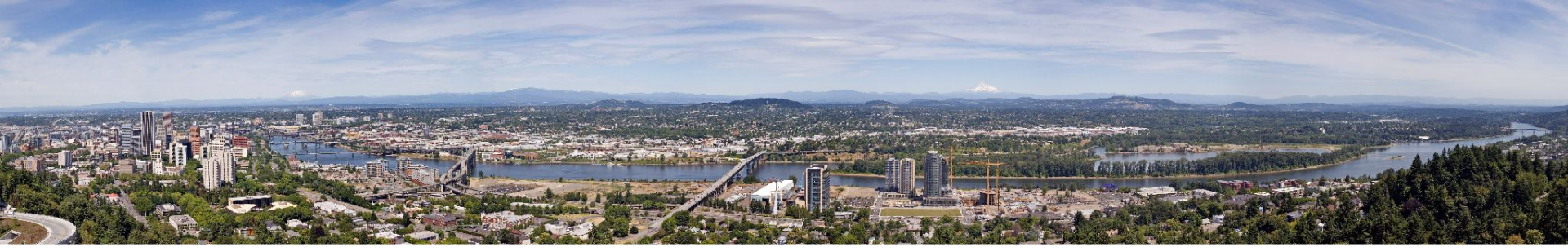
- We will do a group zoom shot after the panel!

Let's begin!

Keynote: Accelerating Analytics at the Edge

Ada Gavrilovska, Georgia Tech

Ada Gavrilovska is Associate Professor in the School of Computer Science at Georgia Tech. Her research is focused on designing systems for emerging technologies, and she develops new systems software solutions in response to new hardware, applications, and use cases. Her past research has considered opportunities and challenges resulting from programmable network processors, high-performance interconnects, multicores, virtualization and cloud computing. Her recent work is driven by two major trends rooted in the exponential growth of data-intensive workloads – the proliferation of new memory system designs, and the shift to edge computing. Gavrilovska's research is supported by the NSF, the US Department of Energy, the SRC/DARPA JUMP program, and by multiple industry awards. She recently served as a Program Co-Chair for USENIX ATC'20 and as an Associate Editor for the IEEE Transactions on Cloud Computing.



PAISE 2021

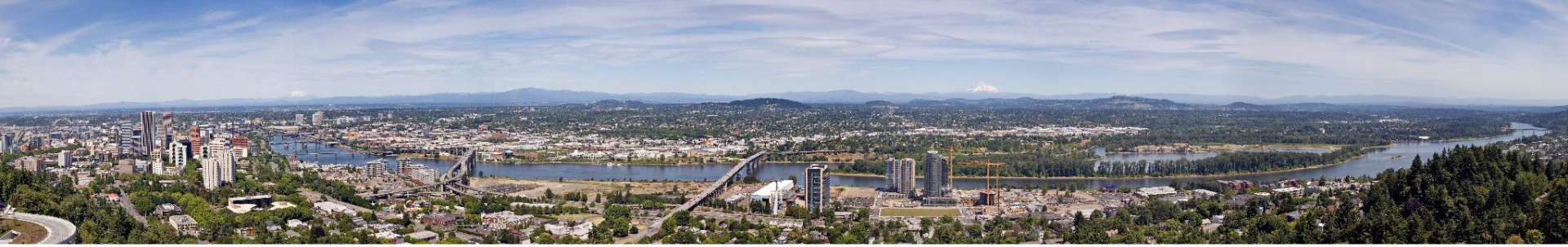
3rd Workshop on
Parallel **AI** and **S**ystems for the **E**dge

https://paise.org
Friday, May 21st 2021

SESSION 1 (95 min)

Session 1: UTC 15:45 - 17:20 (95 min)

- 15:45 - 16:05 : **Addressing the Constraints of Active Learning on the Edge.** Enrique Nueve, Sean Shahkarami, Seongha Park and Nicola Ferrier
- 16:05 - 16:30 : **Informed Prefetching in I/O Bounded Distributed Deep Learning.** Xiaojun Ruan and Haiquan Chen
- 16:30 - 16:55 : **Performance Evaluation of Deep Learning Compilers for Edge Inference.** Gaurav Verma, Yashi Gupta, Abid M. Malik and Barbara Chapman
- 16:55 - 17:20 : **DataVinci: Proactive Data Placement for Ad-Hoc Computing** Martin Breitbach, Janick Edinger, Dominik Schäfer and Christian Becker



PAISE 2021

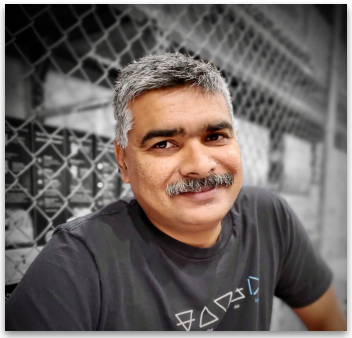
3rd Workshop on
Parallel **AI** and **S**ystems for the **E**dge

https://paise.org
Friday, May 21st 2021

Panel (80 min)

Panelists

- Allaukik Abhishek, ARM Research
- Fahim Kawsar, Nokia Bell Labs
- Hana Khamfroush, University of Kentucky
- Priya Panda, Yale University
- Nhan V. Tran, Fermi National Accelerator Laboratory



Panel Questions

1. How do you see the future of edge-computing evolving?

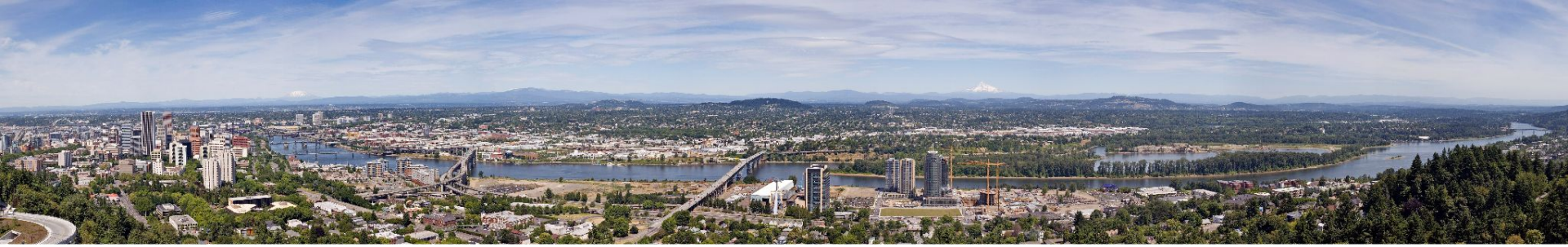
2. What challenges do you see in achieving this vision going forward (e.g., privacy, laws/regulations, energy, algorithms, platforms, monetization)?

3. How is the boundary of the edge going to change?

4. What kinds of advancements in associated fields, particularly computing (software/hardware) and AI/ML, would be fundamentally transformative in achieving the above edge vision and beyond?

5. Is this edge-computing's first rodeo or have efforts in the past, likely decades ahead of their time, failed due to the lack of other technological and practice advancements?

Zoom Photo Time!!!



PAISE 2021

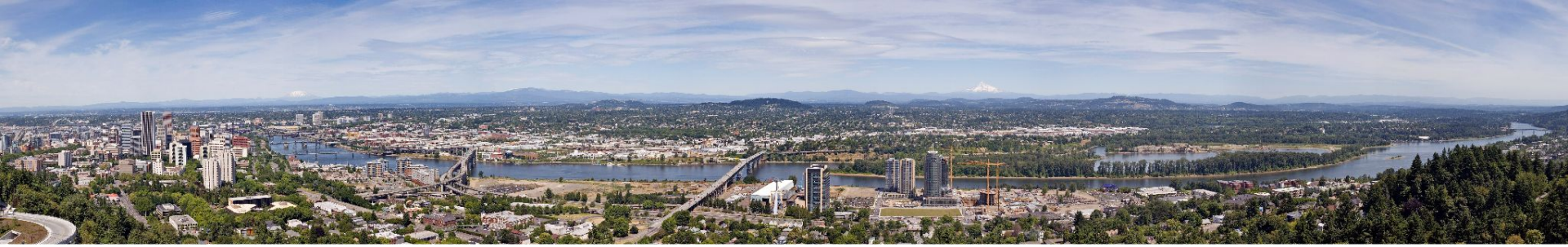
3rd Workshop on
Parallel **AI** and **S**ystems for the **E**dge

https://paise.org
Friday, May 21st 2021

SESSION 2 (80 min)

Session 2: UTC 19:10 - 20:30 (80 min)

- 19:10 - 19:30 : **Pilot-Edge: Distributed Resource Management Along the Edge-to-Cloud Continuum.** Andre Luckow, Kartik Rattan and Shantenu Jha
- 19:30 - 19:55 : **INT Based Network-Aware Task Scheduling for Edge Computing.** Bibek Shreshta, Richard Cziva and Engin Arslan
- 19:55 - 20:20 : **Performance Comparison for Scientific Computations on the Edge via Relative Performance.** Aravind Sankaran and Paolo Bientinesi
- 20:20 - 20:30 : **Closing Remarks.** PAISE Organizers



PAISE 2021

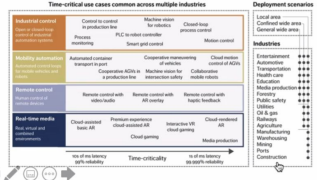
3rd Workshop on
Parallel **AI** and **S**ystems for the **E**dge

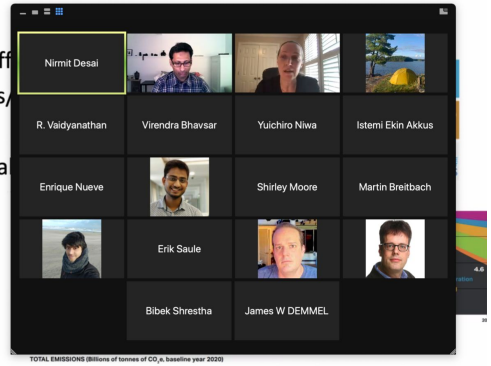
https://paise.org
Friday, May 21st 2021

Concluding Remarks

Edge Computing Opportunities

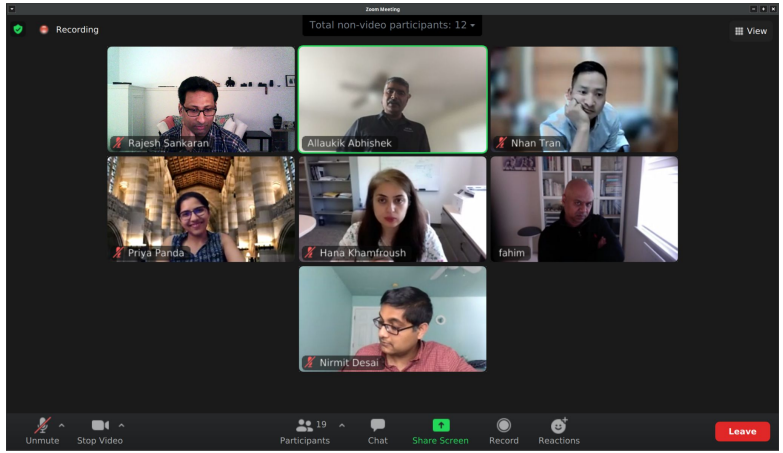
- Reduce/remove data movement
- 5+G/6+WiFi/..., => new energy-eff
- Virtualization, software functions,
- Enabler for new applications
- Aligned with UN SDG, Exponentia

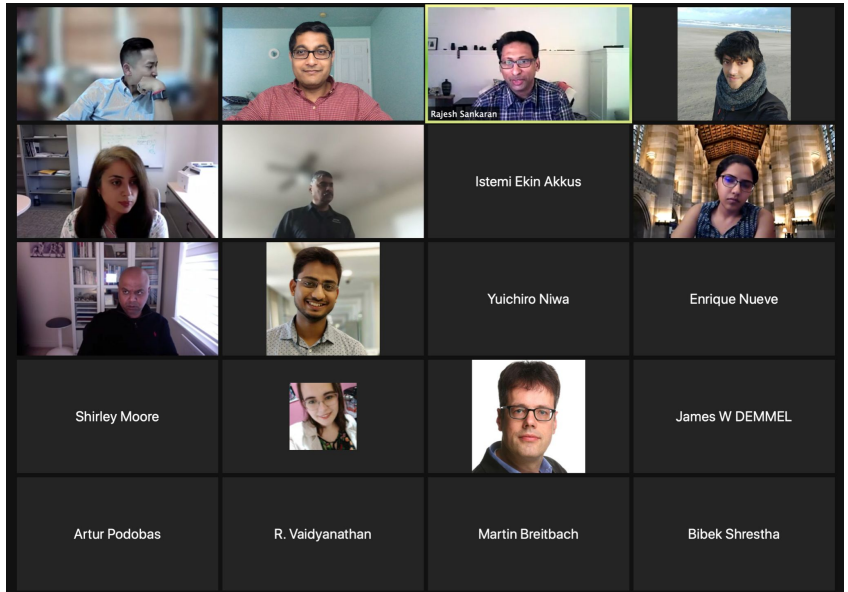




Keynote!

Panel!





PAISE 2021

Concluding Remarks

- Special thanks to the keynote speaker and the panelists.
- And to all the authors and speakers for your punctuality, questions and working with all the asks.
- Thanks to you, the audience, for making this workshop very interesting and exciting! Interaction is the name of the game here!
- And a very special thanks to everyone of you here right now!

Thanks!

General Chairs

- Istemi Ekin Akkus, Nokia Bell Labs
- Nirmit V Desai, IBM Research

Workshop Organizers

- Pete Beckman, Argonne National Laboratory, USA
- Rajesh Sankaran, Argonne National Laboratory, USA