2022 IEEE TCCA Young Computer Architect Award

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Domain-Specific Accelerators

• Specialized hardware designed for a domain of applications.

Research Theme: Enable energy-efficient computing with specialized hardware, while improving flexibility and design productivity.
Modeling Accelerators

“We are unable to evaluate systems with multiple accelerator stores due to the difficulty of obtaining a large number of distinct accelerators.”

- Back in 2009, the architecture community still largely focused on multicore architecture.
- There was no standard modeling and simulation flow for accelerators.

How can we deliver scalable ML performance with chiplet-based architecture?
Integrating Accelerators

How can we better support system-level integration and programming of accelerators?

Gemmini: Full-System DNN Integration

- Gemmini [DAC’2021, Best Paper Award]
  - https://github.com/ucb-bar/gemmini
- CoSA [ISCA’2021]
  - https://github.com/ucb-bar/cosa
Thank you!

David Brooks  Gu-Yeon Wei  Harvard VLSI-Arch Group
Bill Dally  Joel Emer  Brucek Khailany  Steve Keckler  NVIDIA Research
Krste Asanovic  David Patterson  Bora Nikolic  UC Berkeley ADEPT/SLICE Lab
Lieven Eeckhout