2nd Accelerator Architecture in Computational Biology and Bioinformatics workshop (AACBB-2019)

February 16th, 2019

In conjunction with 25th IEEE International Symposium on High-Performance Computer Architecture (HPCA-2019)

Washington D.C., USA

Workshop website	https://aacbb-workshop.github.io/
Submission link	https://easychair.org/conferences/?conf=aacbb2019
Submission deadline	December 25, 2018, EoD AoE
Notifications	December 28, 2018

Over the last decade, the advent of high-throughput sequencing techniques brought an exponential growth in biosequence database sizes. With increased throughput demand and popularity of computational biology tools, reducing time-to-solution during computational analysis has become a significant challenge in the path to scientific discovery.

Conventional computer architecture is proven to be inefficient for computational biology and bioinformatics tasks. For example, aligning even several hundred DNA or protein sequences using progressive multiple alignment tools consumes several CPU hours on high performance computer. Hence, computational biology and bioinformatics rely on hardware accelerators to allow processing to keep up with the increasing amount of data generated from biology applications.

In a typical application, dominant portion of the runtime is spent in a small number of computational kernels, making it an excellent target for hardware acceleration. The combination of increasingly large datasets and high performance computing requirements make computational biology prime candidate to benefit from accelerator architecture research. Potential directions include 3D integration, near-data processing, automata processing, associative processing and reconfigurable architectures.

This workshop will focus on architecture and design of hardware accelerators for computational biology and bioinformatics problems. We plan to present and discuss a variety of acceleration techniques, accelerator architectures and their implications on the development of computational biology.

Submission Guidelines

Interested authors are encouraged to submit papers (2-5 pages) through EasyChair: https://easychair.org/conferences/?conf=aacbb2019.

The full version should be a PDF file in HPCA25 submission format. For formatting instructions please refer to: http://hpca2019.seas.gwu.edu/guidelines_for_submission.html

List of Topics

- Impact of bioinformatics and biology applications on computer architecture
- Bioinformatics and computational biology accelerator architecture and design
- 3D memory-logic stack based accelerators
- Automata processing in bioinformatics and computational biology applications
- Associative processing in bioinformatics and computational biology applications
- Near-data (in-memory) acceleration of bioinformatics and computational biology applications
- Emerging memory technologies and their impact on bioinformatics and computational biology
- Embedded and reconfigurable architectures
- Field programmable logic based accelerators
- Bioinformatics and computational biology-inspired hardware/software trade-offs
- Software acceleration of computational biology and bioinformatics

Invited Speakers

- William Dally, Chief Scientist of NVIDIA and Stanford
- Onur Mutlu, ETH Zurich
- Ananth Kalyanaraman, WSU

Committees

Program Committee

- Ananth Kalyanaraman, WSU
- Can Alkan, Bilkent University
- Engin Ipek, University of Rochester
- Jason Cong, UCLA
- Mattan Erez, UT Austin

- Mircea Stan, UVA
- Onur Mutlu, ETH/CMU
- Ran Ginosar, Technion
- Ronnie Ronen, Technion
- Yuan Xie, UCSB

Organizing committee

- Roman Kaplan (romankap@gmail.com)
- Leonid Yavits (leonid.yavits@gmail.com)

Department of Electrical Engineering, Technion, Israel Institute of Technology

Important Notes

- **Presenting a paper in the workshop does not preclude publication in other venues**
- We will have a poster session. Some papers might be accepted as 'poster' papers.
- We plan to have a lightning round, where the authors of a poster paper are given an opportunity to present their work to all attendants in a "lightning" 2min presentation.

Contact

All questions about submissions should be emailed to Leonid Yavits (leonid.yavits@gmail.com) or Roman Kaplan (romankap@gmail.com)