

DAMLA SENOL CALI

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Electrical and Computer Engineering Department
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RESEARCH INTERESTS

- ◆ Hardware Acceleration of Bioinformatics Applications
- ◆ Genome Sequence Analysis Tools
- ◆ Hardware/Software Co-Design
- ◆ Memory Systems
- ◆ Processing-in-Memory

EDUCATION

Carnegie Mellon University, Pittsburgh, PA

Ph.D. in Electrical and Computer Engineering

May 2021 (expected)

Advisors: Prof. Onur Mutlu, Dr. Saugata Ghose

Carnegie Mellon University, Pittsburgh, PA

M.S. in Electrical and Computer Engineering

December 2019

Advisors: Prof. Onur Mutlu, Dr. Saugata Ghose

Bilkent University, Ankara, Turkey

B.S. in Computer Engineering

June 2015

WORK EXPERIENCE

Intel Labs, Portland, OR, USA

Research Intern, *May 2020 – Present*

Carnegie Mellon University, Pittsburgh, PA, USA

Graduate Research and Teaching Assistant, *August 2015 – Present*

Intel Labs, Santa Clara, CA, USA

Research Intern, *May 2018 – August 2018*

Bilkent University, Ankara, Turkey

Undergraduate Research and Teaching Assistant, *February 2013 – June 2015*

PEER-REVIEWED PUBLICATIONS

Damla Senol Cali, Gurpreet S. Kalsi, Zulal Bingol, Can Firtina, Lavanya Subramanian, Jeremie S. Kim, Rachata Ausavarungnirun, Mohammed Alser, Juan Gomez-Luna, Amirali Boroumand, Anant Nori, Allison Scibisz, Sreenivas Subramoney, Can Alkan, Saugata Ghose, and Onur Mutlu. *GenASM: A High-Performance, Low-Power Approximate String Matching Acceleration Framework for Genome Sequence Analysis*. To appear in *Proceedings of the 53rd International Symposium on Microarchitecture (MICRO)*, October 2020.

Mohammed Alser, Zulal Bingol, Damla Senol Cali, Jeremie S. Kim, Saugata Ghose, Can Alkan, and Onur Mutlu. *Accelerating Genome Analysis: A Primer on an Ongoing Journey*. To be published in *IEEE MICRO*, 2020.

Can Firtina, Jeremie S. Kim, Mohammed Alser, Damla Senol Cali, A. Ercument Cicek, Can Alkan, and Onur Mutlu. *Apollo: A Sequencing-Technology-Independent, Scalable, and Accurate Assembly Polishing Algorithm*. *Bioinformatics*, February 2020.

Saugata Ghose, Tianshi Li, Nastaran Hajinazar, Damla Senol Cali, and Onur Mutlu. *Demystifying Workload-DRAM Interactions: An Experimental Study*. In *ACM SIGMETRICS*, June 2019.

Jeremie S. Kim, Damla Senol Cali, Hongyi Xin, Donghyuk Lee, Saugata Ghose, Mohammed Alser, Hasan Hassan, Oguz Ergin, Can Alkan, and Onur Mutlu. *GRIM-Filter: Fast Seed Location Filtering in DNA Read Mapping Using Processing-in-Memory Technologies*. In *BMC Genomics*, May 2018.

Damla Senol Cali, Jeremie Kim, Saugata Ghose, Can Alkan, and Onur Mutlu. *Nanopore Sequencing Technology and Tools for Genome Assembly: Computational Analysis of the Current State, Bottlenecks and Future Directions*. In *Briefings in Bioinformatics*, April 2018.

CONFERENCE PRESENTATIONS

Damla Senol Cali, Gurpreet S. Kalsi, Zulal Bingol, Can Firtina, Lavanya Subramanian, Jeremie S. Kim, Rachata Ausavarungnirun, Mohammed Alser, Juan Gomez-Luna, Amirali Boroumand, Anant Nori, Allison Scibisz, Sreenivas Subramoney, Can Alkan, Saugata Ghose, and Onur Mutlu. *GenASM: A High-Performance, Low-Power Approximate String Matching Acceleration Framework for Genome Sequence Analysis*. Presented at ARM Research, September 2020.

Damla Senol Cali, Gurpreet S. Kalsi, Lavanya Subramanian, Can Firtina, Anant Nori, Jeremie S. Kim, Zulal Bingol, Rachata Ausavarungnirun, Mohammed Alser, Juan Gomez-Luna, Amirali Boroumand, Allison Scibisz, Can Alkan, Sreenivas Subramoney, Saugata Ghose, and Onur Mutlu. *BitMAC: An In-Memory Accelerator for Bitvector-Based Sequence Alignment of*

Both Short and Long Genomic Reads. Presented at TECHCON 2019, Austin, TX, USA, September 2019. **Top 10 Best Student Presenter Award.**

Damla Senol Cali, Jeremie S. Kim, Saugata Ghose, Can Alkan, and Onur Mutlu. ***Nanopore Sequencing Technology and Tools for Genome Assembly: Computational Analysis of the Current State, Bottlenecks and Future Directions.*** Presented at the 2nd HPCA Workshop on Accelerator Architecture in Computational Biology and Bioinformatics (AACBB), Washington, DC, USA, February 2019.

Damla Senol Cali, Zulal Bingol, Jeremie S. Kim, Rachata Ausavarungnirun, Saugata Ghose, Can Alkan, and Onur Mutlu. ***Accelerating Approximate Pattern Matching with Processing-In-Memory (PIM) and Single-Instruction Multiple-Data (SIMD) Programing.*** Presented at the Eighth RECOMB Satellite Workshop on Massively Parallel Sequencing (RECOMB-Seq) Poster Session, Paris, France, April 2018. **Best Poster Award.**

Damla Senol, Jeremie Kim, Saugata Ghose, Can Alkan, and Onur Mutlu. ***Nanopore Sequencing Technology and Tools: Computational Analysis of the Current State, Bottlenecks and Future Directions.*** Presented at Intelligent Systems for Molecular Biology (ISMB) / European Conference on Computational Biology (ECCB) Poster Session, Prague, Czech Republic, July 2017.

Damla Senol, Jeremie Kim, Saugata Ghose, Can Alkan, and Onur Mutlu. ***Nanopore Sequencing Technology and Tools: Computational Analysis of the Current State, Bottlenecks and Future Directions.*** Presented at Pacific Symposium on Biocomputing (PSB) Poster Session, Hawaii, USA, January 2017.

Jeremie Kim, Damla Senol, Hongyi Xin, Donghyuk Lee, Mohammed Alser, Hasan Hassan, Oguz Ergin, Can Alkan, and Onur Mutlu. ***Genome Read In-Memory (GRIM) Filter: Fast Location Filtering in DNA Read Mapping with Emerging Memory Technologies.*** Presented at 20th Annual International Conference on Research in Computational Molecular Biology (RECOMB) Poster Session, Santa Monica, CA, USA, April 2016.

PROJECTS

iGarson, June 2015. **Most Usable Senior Project Award.**

iGarson is a mobile application to ease your restaurant experience with reservation, ordering and table selection functions. It is developed for both iOS and Android mobile devices.

Transmission Patterns Discovery of Genome Structural Variations among Generations of a Family, May 2015.

Detecting structural variations of the whole genomes of 17 family members with using different sequencing-based computational tools and discovering the transmission patterns of these variations among these 3 generations of the family.

CERTIFICATIONS

IB Bilingual Diploma, Certificate of Achievement, August 2010.

MEMBERSHIPS

IEEE and IEEE Computer Society (December 2017 – Present)

International Society for Computational Biology (ISCB) (February 2016 – Present)

Bilkent University Alumni Association (June 2015 – Present)

TED Ankara College Alumni Association (June 2010 – Present)