**Mehmet Esat Belviranli**
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## Research Interests

- Heterogeneous architectures, runtime systems, performance modeling, task-based execution, deep memory hierarchies, source-to-source translation, systems research for deep learning, NVMs, parallel programming paradigms.

## Education

- **University of California, Riverside** Riverside, CA
  *Doctor of Philosophy in Computer Science and Engineering* *Sep. 2009 - Sep. 2016*
  **Dissertation:** Efficient Execution of Scientific Applications on Heterogeneous Architectures
  **Advisor:** Prof. Laxmi N. Bhuyan
- **Bilkent University** Ankara, Turkey
  *Master of Science in Computer Science and Engineering* *Sep. 2006 - Aug. 2009*
  **Dissertation:** A Circular Layout Algorithm for Clustered Graphs
  **Advisor:** Prof. Ugur Dogrusoz
- **Bilkent University** Ankara, Turkey
  *Bachelor of Science in Computer Science and Engineering* *Sep. 2001 - May 2006*

## Work Experience

- **Oak Ridge National Laboratory** Oak Ridge, TN
  *Computer Scientist, Computer Science and Mathematics Division* *Dec. 2018 - Current*
  **Supervisor:** Dr. Jeffrey S. Vetter
- **Oak Ridge National Laboratory** Oak Ridge, TN
  *Postdoctoral Research Associate, Computer Science and Mathematics Division* *Nov. 2016 - Nov. 2018*
  **Mentor:** Dr. Seyong Lee
- **University of California, Riverside** Riverside, CA
  *Research Assistant, Computer Science and Engineering Department* *Sep. 2010 - Sep. 2016*
  **Advisor:** Prof. Laxmi N. Bhuyan
- **Samsung Information Systems America** San Jose, CA
  *Processor Architect Intern, Advanced Processor Lab* *Jun. 2013 Sep. 2013*
  **Mentor:** Dr. Sung-Soo Park
- **Tom Sawyer Software** Oakland, CA
  *Software Engineer* *Aug. 2007 Jul. 2008*
  **Manager:** Dr. Brett Zane-Ulman

## Teaching & Mentoring Experience

- **Mentoring** Oak Ridge National Laboratory
  Mentored four Ph.D. students via
  ORNL/ORISE-ASTRO internship program Spring'17, Summer'17, Spring'18, Summer'18
- **Co-Lecturer & Teaching Assistant** University of California, Riverside
  Parallel Processing Architectures Spring'14, Spring'15, > 30 students
  Advanced Computer Architecture Fall'13, > 30 students
  Design and Architecture of Computer Systems Spring'15, > 30 students

- **Teaching Assistant** Bilkent University, Ankara, Turkey
  Object Oriented Software Engineering Spring'09, > 100 students
  Algorithms and Programming Fall'08, > 100 students

# Publications

## Journals

J1. Mehmet E. Belviranli, Laxmi N. Bhuyan and Rajiv Gupta, "A Dynamic Self-Scheduling Scheme for Heterogeneous Multiprocessor Architectures," *ACM Transactions on Architure and Code Optimzation 9, 4, Article 57 (TACO)* , January 2013.

J2. Ugur Dogrusoz, Mehmet E. Belviranli and Alptug Dilek, "CiSE: A Circular Spring Embedder Layout Algorithm," *IEEE Transactions on Visualization and Computer Graphics* , June 2013.

J3. Alptug Dilek, Mehmet E. Belviranli and Ugur Dogrusoz, "VISIBIOweb: Visualization and Layout Services for BioPAX Pathway Models," *Nucleic Acids Research 38. suppl 2* , July 2010.

## Conferences

C1. Mehmet E. Belviranli and Jeffrey S. Vetter, "FLAME: Graph-based Hardware Representations for Rapid and Precise Performance Modeling," *Design, Automation & Test in Europe Conference & Exhibition (DATE)*, March 2019.

C2. Pak Markthub, Mehmet E. Belviranli, Seyong Le, Jeffrey S. Vetter and Satoshi Matsuoka, "DRAGON: Breaking GPU Memory Capacity Limits with Direct NVM Access," *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC)* , November 2018.

C3. Mehmet E. Belviranli, Seyong Lee and Jeffrey S. Vetter, "Designing Algorithms for the EMU Migrating-threads-based Architecture," *IEEE High Performance Extreme Computing Conference (HPEC)* , September 2018. [Best Paper Finalist]

C4. Mehmet E. Belviranli, Seyong Lee, Jeffrey S. Vetter and Laxmi N. Bhuyan, "Juggler: A Dependency-Aware Task Based Execution Framework for GPUs," *Proceedings of ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP)* , February 2018.

C5. Amir A. Abdolrashidi, Devashree Tripathy, Mehmet E. Belviranli, Daniel Wong, Laxmi N Bhuyan, "Wireframe: supporting data-dependent parallelism through dependency graph execution in GPUs.," *Proceedings of the 50th Annual IEEE/ACM International Symposium on Microarchitecture (MICRO)* , October 2017.

C6. Mehmet E. Belviranli, Farzad Khorasani, Laxmi N. Bhuyan and Rajiv Gupta, "CuMAS: Data Transfer Aware Multi-Application Scheduling for Shared GPUs," *International Conference on Supercomputing (ICS)* , June 2016.

C7. Farzad Khorasani, Mehmet E. Belviranli, Rajiv Gupta and Laxmi N. Bhuyan, "Stadium Hashing: Scalable and Flexible Hashing on GPUs," *International Conference on Parallel Architectures and Compilation Techniques (PACT)* , October 2015.

C8. Mehmet E. Belviranli, Peng Deng, Laxmi N Bhuyan, Rajiv Gupta and Qi Zhu, "PeerWave: Exploiting Wavefront Parallelism on GPUs with Peer-SM Synchronization," *International Conference on Supercomputing (ICS)* , June 2015.

C9. Chih H. Chou, Mehmet E. Belviranli and Laxmi N. Bhuyan, "Thermal prediction and scheduling of network applications on multicore processors," *Symposium on Architectures for Networking and Communications Systems (ANCS)* , October 2013.

## Workshops

W1. Mehmet E. Belviranli, Weize Yu and Selcuk Kise, "Ultra-Fine Grain Power Management at Datapath-Level: Fact or Fiction," *International Conference on Architectural Support for Programming Languages and Operating Systems - Wild and Crazy Ideas Session (ASPLOS - WACI)* , January 2015.

W2. Mehmet E. Belviranli, Chih Hsun Chou, Laxmi N. Bhuyan and Rajiv Gupta, "A Paradigm Shift in GP-GPU Computing: Task Based Execution of Applications with Dynamic Data Dependencies," *Sixth international workshop on Data Intensive Distributed Computing (DIDC, co-located with HPDC)* , January 2014.

## Posters

P1. Mehmet E. Belviranli, Seyong Le and Jeffrey S. Vetter, "Programming the EMU Architecture: Algorithm Design Considerations for Migratory-Threads-Based Systems," *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC)* , November 2018.

P2. Pak Markthub, Mehmet E. Belviranli, Seyong Le, Jeffrey S. Vetter and Satoshi Matsuoka, "Efficiently Extending GPU Addressable Memory with NVM," *GPU Technology Conference (GTC)* , March 2018.

P3. Cagri Aksay, Fatma Arik, Esra Ataer, Asli Ayaz, Ozgun Babur, Mehmet E. Belviranli, et. al., "PATIKAweb: A Web Service for Querying, Visualizing, and Analyzing a Graph Based Pathway Database," *Intelligent Systems for Molecular Biology (ISMB)* , June 2005.

## Grants

Contributed significantly to writing of several proposals, including the following which were awarded:

- DARPA/MTO-ERI Award: *Energy Efficient Computing on GPU-based Heterogeneous Systems*, 2018-2022. (PI: Jeffrey S. Vetter, awarded $6M, http://ft.ornl.gov/research/dssoc)
- NSF Award: *Energy Efficient Computing on GPU-based Heterogeneous Systems*, 2015-2018. (PI: Laxmi N Bhuyan)
- NSF Award: *Efficient CPU-GPU Communication for Heterogeneous Architectures*, 2014-2017. (PI: Laxmi N Bhuyan)

## Professional Activities and Service

- Technical program committee member
  – ISC High Performance (ISC), 2019
  – Principles and Practice of Parallel Programming (PPoPP) Artifact Evaluation, 2018
- Publications and web chair
  – International Conference on Supercomputing (ICS), 2015
- External reviewer
  – Journals: TPDS, TACO, JPDC, PARCO, JETCS, CCPE
  – Conferences: ASPLOS, ISCA, MICRO, IPDPS, EURO-PAR
- Lab-level point of contact and reviewer for DOE- Exascale Computing Project (ECP) Pathforward Program, 2017-2019.
- Served as mentor in SC'18 Mentor-Protege program, 2018.
- Professional Societies
  – Member, IEEE
  – Member, ACM

## Awards

- Best Paper Finalist in IEEE High Performance Extreme Computing Conference, 2018
- 1st year graduate fellowship awarded by University of California, Riverside, 2009
- Full scholarship and stipend awarded by Bilkent University, Ankara, Turkey, 2001-2006
- Outstanding success in national university entrance exam:
  - **89**$^{th}$ over 1.5 million candidates, Turkey, 2001
- Abroad Undergraduate Education Fellowship by Turkish Government, Turkey, 2001