

# Managing Locality and Parallelism in Multicore Systems

by

**Didem Unat**

Date and Time: April 19<sup>th</sup>, 2018 (Thursday), 13:00

Place: Room Z23, Computer Engineering Building, GTU

*All interested are cordially invited.*

## **ABSTRACT:**

Parallel computer architecture has become increasingly complex both in terms of memory subsystems and computing units, resulting in great programming challenges to the application developers. While applications must be optimized to fully utilize a large and diverse pool of resources, they must be programmed under an elegant and simple code representation that allows for an easy code migration on the next generation supercomputers. Data locality abstractions and asynchronous execution are seen as the potential solutions towards alleviating the programming and scalability challenges. While programming abstractions provide performance portability and programmer's productivity, asynchronous execution meets the high demand for performance and scalability of real-life applications. In this talk, I will present software solutions that I develop and co-develop to ease application development process in terms of (1) programming model and programming abstractions, and (2) runtime system. This talk will also feature the TiDA a tiling library and Perilla runtime system.

## **BIOGRAPHY:**

Didem Unat joined [Koç University](#) in September 2014 as a full time faculty. Previously she was at the [Lawrence Berkeley National Laboratory](#) and worked at the Exascale Combustion Co-design center. She is the recipient of the prestigious [Luis Alvarez Fellowship](#) in 2012 at the Berkeley Lab.

Her research interest lies primarily in the area of high performance computing, parallel programming models, compiler analysis, runtime systems, and performance modeling. Her current work focuses on variety of topics which includes 1) designing programming models for state-of-the-art large scale highly parallel systems, 2) developing system tools to assist programming in multicore, 3) accelerating machine learning applications, industrial and scientific simulations. She also leads the programming abstractions for data locality effort internationally through [PADAL workshop series](#). She received her Ph.D under Prof. Scott B. Baden's research group at [University of California-San Diego](#). In her thesis, she developed the Mint programming model and its source-to-source compiler to facilitate GPGPU programming. She holds a B.S in computer engineering from [Boğaziçi University](#). On her spare time, she enjoys biking, hiking, and making mosaics.