COMPUTER SCIENCE COLLOQUIUM

Composable Open Memory Transactions

Marco Peressotti
Department of Mathematics and Computer Science
University of Udine

Wednesday, 18 January, 2017 at 10:15

U44

Abstract:

Transactional memory (TM) has emerged as a promising high-level concurrency control mechanism alternative to fine grained lock-based synchronization. However, most TM models admit only isolated transactions, which are not adequate in multi-threaded programming where transactions have to interact via shared data before committing. We present Open Transactional Memory (OTM), a programming model supporting safe, data-driven interactions between composable memory transactions. In this model, different transactions are transparently merged at runtime as soon as they access to shared variables; their threads can then cooperate, until they all either commit or abort together. Thus, this model relaxes the isolation requirement still guaranteeing atomicity; moreover, it allows for loosely-coupled interactions since transaction merging is dynamic and driven only by accesses to shared data, with no need to specify participants beforehand. We present OTM in the setting of the Haskell language, taking advantage of its type system for guaranteeing composability.

Host: Fabrizio Montesi