University at Buffalo
The State University of New York

Department of Computer Science and Engineering

Presents the Faculty Candidate

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Lightweight Asynchronous Concurrency Abstractions for Scalable Multicore Architectures

As architectures include ever increasing amounts of processors and become more complex, programming such systems necessarily becomes more complicated. Managing this complexity can be achieved through the use of language abstractions aimed at simplifying concurrent programming. In such systems asynchrony is typically employed to hide high latency operations and to extract additional parallelism by conceptually splitting the asynchronous action from its enacting thread. Although asynchronous communication is an important feature of many concurrent systems, building composable abstractions that leverage asynchrony is challenging. In this talk, we present the design and rationale for asynchronous events, an abstraction that enables composable construction of complex asynchronous protocols without sacrificing the benefits of abstraction or performance. Asynchronous events are realized in the context of Concurrent ML's first-class event abstraction and are built on Multi-MLton's advanced managed runtime that supports ultra-lightweight threading and lazy split-heap GC.

Biography: Lukasz Ziarek is currently working as a visiting assistant professor at Purdue University. He received his Ph.D. in Computer Science from Purdue University in May 2011 and his B.S. in Computer Science in December 2003 from the University of Chicago. His main line research focuses on language, compiler, and language runtime design targeting concurrent/parallel systems. He is currently working on the Multi-MLton, a multi-core aware extension of the MLton SML compiler, the Fiji VM, a real-time Java VM with support for mixed-criticality applications, and Sting, an optimizing compiler extension to Java that leverages session types for optimizing communication protocols. He is a co-founder of Fiji Systems Inc.

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