Keith Godwin Chapman

CONTACT
INFORMATION

Bigstream Solutions, Inc
2570 W. El Camino Real, Ste 510
Mountain View, CA, 94040

Mobile : +1-765-586-4431
E-mail : keithgchapman@gmail.com
Web : keith-chapman.com

RESEARCH
INTERESTS

Programming languages: language design and implementation, compilers, language runtimes, virtual machines, garbage collection, concurrency, transactional memory

EDUCATION

Purdue University, West Lafayette, IN

Ph.D., Department of Computer Science, December 2016
- Thesis Topic: *Hybrid STM/HTM for Nested Transactions in Java*
- Adviser: Professor Antony L. Hosking
- Area of Study: Programming languages and language runtimes

M.S., Department of Computer Science, May 2012

University of Moratuwa, Moratuwa, Sri Lanka

B.S., Department of Computer Science & Engineering, August 2006
- Honors Degree with *First Class* Distinction

PROFESSIONAL
EXPERIENCE

Bigstream Solutions, Inc, Mountain View, CA
Product Engineer   October 2016 to Present
- Part of the core software team involved in building a big data acceleration engine for Apache Spark using compilation technology.
- Worked across all aspects of the stack, from integration with Spark to the runtime of the system.
- Led the development of xRay - a tool that can be used to profile and diagnose performance issues in Spark applications.

Research Intern, IBM Research, Austin, TX   May 2013 to December 2013
Data Center Networking group
- Designed and implemented a multi-tenant virtual machine for Java, based on Open-JDK
- Core VM services such as compilation and garbage collection were transformed to system level services that could be shared across tenants

Research Intern, Microsoft Research, Redmond, WA   May 2012 to August 2012
Research in Software Engineering (RiSE) group
- Built ILToC, a project to translate .NET intermediate language (MSIL) to C
- Implemented structured exception handling, virtual method invocation, generics, locking and threading and other basic infrastructure of the translator

Research Intern, IBM T. J. Watson Research Center, NY May 2011 to August 2011
X10 group
- Incorporated a custom serialization protocol to X10, the goal of the work was to run X10 code in hybrid mode (Some places running Java and the others running C++)
- Modified the polyglot based compiler to emit custom serialization code

WSO2 Inc, Colombo, Sri Lanka

Technical Lead and Product Manager   September 2006 to August 2009
- Led the design and development of the WSO2 Mashup Server, now part of the WSO2 Application Server
- Contributed to many other open source projects such as the WSO2 Application Server, WSO2 Enterprise Service Bus and the WSO2 Data Services Server
- Worked closely with the W3C Web Services Description Working Group to standardize the WSDL 2.0 specification
- Led several customer engagements and conducted training sessions pertaining to WSO2 products and Apache Axis2

Apache Software Foundation

Committer and Project Management Committee Member November 2006 to Present
- Implemented support for WSDL 2.0 in the Apache Axis2 web services engine
- Contributed to many Apache Software Foundation web services projects

Virtusa (Pvt) Ltd, Colombo, Sri Lanka

Intern   January 2005 to August 2005
- Involved in developing a project management dashboard for Virtusa. Was involved with the project from its inception to the end

RESEARCH
EXPERIENCE

Research Assistant, Purdue University   August 2009 to present
Department of Computer Science and Engineering
- Designed and implemented XJ, a dialect of Java which offers a full-blown hybrid, STM (Software Transactional Memory)/HTM (Hardware Transactional Memory) programming framework that supports closed nested, open nested and boosted transactions
- XJ allows both HTM and STM transactions to run concurrently and shows that open nesting increases the envelope of concurrency and transaction sizes that can be accommodated in hardware
- XJ comprise of a modified javac compiler, a dynamic bytecode rewriting framework based on ASM, a runtime library and a modified version of OpenJDK with support for Intel TSX instructions

TEACHING
EXPERIENCE

Purdue University, West Lafayette, IN

Teaching Assistant
- CS 505: Distributed systems   August 2011 to December 2011
- CS 240: Programming in C   January 2012 to May 2012

PUBLICATIONS

[1] **K. Chapman**, A. L. Hosking, and J. E. B. Moss. Hybrid STM/HTM for nested transactions on OpenJDK. In: *ACM SIGPLAN Conference on Object-Oriented Programming Systems, Languages, and Applications*, Amsterdam, Netherlands, Nov. 2016. doi:10.1145/2983990.2984029. **Won best paper award**.

[2] **K. Chapman**, A. L. Hosking, and J. E. B. Moss. Extending OpenJDK to support hybrid STM/HTM: preliminary design. In: *VMIL 2016 Proceedings of the 8th International Workshop on Virtual Machines and Intermediate Languages*, Amsterdam, Netherlands, Nov. 2016. doi:10.1145/2998415.2998417

[3] **K. Chapman**, A. L. Hosking, J. E. B. Moss and T. Richards. Closed and open nested atomic actions for Java: Language design and prototype implementation. In: *International Conference on Principles and Practice of Programming on the Java Platform: Virtual Machines, Languages, and Tools*, pages 169-180, Cracow, Poland, Oct. 2014. doi:10.1145/2647508.2647525

[4] **K. Chapman**, A. Hussein, A. L. Hosking. X10 on the single-chip cloud computer: porting and preliminary performance. In: *Proceedings of the 2011 ACM SIGPLAN X10 Workshop*, Article 7 , 8 pages, San Jose, California, 2011. doi:10.1145/2212736.2212743