George K. Thiruvathukal

Summary

A computer scientist with over a decade of professional experience and a strong balance of industry, teaching, and research credentials. My professional interests are in high-performance computing, distributed object frameworks, experimental computing systems and environments, programming language design and implementation, scientific computing, and virtually all aspects of advanced computer and computational science.

Contact Information

U.S. Mail

3900 N. Pine Grove Avenue #807
Chicago, IL 60613
Phone number available upon request via e-mail.

Internet

E-Mail: george.k.thiruvathukal@acm.org
WWW: http://www.jhpc.org/george

Career Highlights

Recent Accomplishments

- Member of Java '98 Program Committee and Registration Chair.
  See ***http://www.cs.ucsb.edu/conferences/java98*** for the full program.
- Member of PDPTA '98 Program Committee. General chair for special session entitled High Performance Computing with Distributed Object Technology.
  See ***http://www.jhpc.org/pdpta98*** and ***http://www.jhpc.org/pdpta98_objects*** for more information and call for papers.
- Designed and implemented of the Globus Visualization Tools (in Java), which was demonstrated at Supercomputing 1997. See ***http://www.jhpc.org*** for a demonstration.
- Completed the design and implementation of MPI/Nexus, a wide area implementation of MPI, which allows MPI to be run on multiple massively parallel processor and workstation machines in any combination.
- Led the design and implementation of Reflective Remote Method Invocation (RRMI), a replacement for the RMI product shipped by Sun Microsystems for high-performance computing applications written in Java.
- Led the design and implementation of Active/Java, an Actors-derived object model which supports coordination (as found in Linda), active objects (as found in Actors), collective communications (as found in MPI), and dataflow.
- Invited by Klaus Schauser of the University of California at Santa Barbara as a guest speaker on Java and high-performance computing in the Parallel Systems Group weekly seminar.
- Invited by Alok Choudhary at Northwestern University as a guest lecturer on Java for his Distributed Systems graduate course.

Other Notable Accomplishments

- Ph.D. dissertation on Enhanced Actors in 1995. Some ideas from the dissertation have subsequently appeared in the Java language and other Sun products such as JavaSpaces. This research was first published in the first

IEEE International Conference (HiPC '94) on High-Performance Computing in Bangalore, India.

- Designed and implemented the Apt Compiler Toolkit in 1988-1989, an object-based toolkit written in the C language for designing programming languages and translators with multiple compilation phases. Utilized this toolkit at Argonne National Laboratory to develop a compiler for an object-oriented language compiler in 1989, which bears many similarities to modern-day Smalltalk and Java.
- Developed and taught the first object-oriented classes at the Illinois Institute of Technology, which combined techniques for analysis methods, design techniques, and programming in C++. This course was first offered in 1991 and was the first complete course on object technology among Chicago-area universities. Subsequently pioneered the first Java-based classes at IIT.

Academic Experience

Argonne National Laboratory, Mathematics and Computer Science Division

Postdoctoral Computer Scientist and Visiting Computer Scientist, 1996-Present

- Primary responsibilities involve research and development to support the Globus project. (See ***http://www.globus.org*** for more information).
- Designed and implemented most of the Posix threads library atop Win32 threads primitives to support the port of Nexus to the Win32 platform.
- Completed the design and implementation of a wide-area implementation of the Message Passing Interface (MPI) using the Nexus communication library.
- Designed and implemented tools to visualize the dynamic information pertaining to a metacomputing information from an LDAP database.

Illinois Institute of Technology, Chicago, Computer Science and Continuing Education

Adjunct Associate Professor and Lecturer, Computer Science, 1996-1997.

Lecturer, Continuing Education, 1997-Present.

- Co-director of the Java and High-Performance Research Group (JHPC). See ***http://www.jhpc.org*** for more information about JHPC. A paper discussing recent work on a replacement for Java's Remote Method Invocation is being presented at the Java '98 Workshop, Stanford University.
- Taught numerous courses in the departments of Computer Science and Continuing Education. All are listed below under ***Courses Taught***.
- Consistently rated as one of the top professors in computer science and continuing education for all courses taught from 1991 to present.
- Co-developed course notes for Java, which will be licensed by IIT and elsewhere beginning at the end of March 1998.

Argonne National Laboratory; Argonne, Illinois; Environmental and Information Sciences Division

Member of Technical Staff, Cooperative Education Program, and Graduate Lab Program, 1987-89.

- Developed a compiler for an object oriented programming language, and co-designed a full run-time system and programming library.

George K. Thiruvathukal

University of New Hampshire

NSF Research Experience for Undergraduates, Summer 1987

- Worked with Phil Hatcher on tools to automatically build code generators for compilers.

Courses Taught

Graduate

- Operating Systems Design and Implementation
- Distributed Object Computing with Java

Undergraduate

- Programming Languages and Translation/Compilers
- Object Oriented Methods and Programming in C++
- Object Oriented Methods and Programming in Java

Short Courses/Professional Training

- Introduction to C and C++
- Java and Objects Primer
- Java Graphical Interfaces
- Java Multithreading
- Unix/C/C++ Certificate Program
- CORBA Primer (late Spring 1998)

Professional Experience

R. R. Donnelley and Sons Company; Chicago, Illinois

Development Manager and Senior Member of Technical Staff, 1993-1996.

Tellabs Operations, Incorporated; Chicago, Illinois

Member of Technical Staff, 1991-1993.

Miscellaneous Consulting Jobs; Chicago, Illinois

Most recently for Lucent Technologies and Baxter Healthcare.

Education

Doctor of Philosophy
Computer Science
November 1995

Illinois Institute of Technology; Chicago, Illinois

- Dissertation entitled ***An Enhanced Actors Model and Programming Environment for Parallel and Distributed Processing***.
- Research published in numerous relevant conferences on parallel and distributed processing.

Master of Science
Computer Science
May 1990

Illinois Institute of Technology; Chicago, Illinois

- Project and research paper entitled ***The Translation of Lucid into Message Driven Computing Language: A Simulation of Demand-Driven Dataflow***.

- Research published in a short paper at International Parallel Processing Symposium '91.

Bachelor of Arts
Computer Science and Physics
Mathematics Minor
August 1986 to May 1988

Lewis University; Romeoville, Illinois

- Graduated summa cum laude. Departmental award in Computer Science. Named to Dean's and National Deans' List every semester.
- Inducted into Sigma Pi Sigma Physics National Honor Society.

Specializations

Hardware

IBM PC compatibles, Unix workstations, Massively Parallel Processors (e.g., IBM SP-2), and exotic networked systems, such as transputers.

Operating Systems

PC operating systems (MS-DOS, Windows 95, Windows NT, OS/2), Linux, Solaris, and most popular versions of Unix.

Programming Languages

Most fluent in C, C++, and Java. Extensive experience with functional (Lisp, Scheme, and FP), imperative (FORTRAN, C, and Pascal), object (Smalltalk, C++, and Java), and scripting (Icon, Perl, and shell) languages.

Publications

Regular Conference Papers
Journal Articles

W. T. O'Connell, G. K. Thiruvathukal, and T. W. Christopher. ***A Generic Modeling Framework for Heterogeneous Parallel and Distributed Computing***. International Conference on Advance Science and Technology '94 (ICAST '94). AT&T Bell Laboratories. Naperville, IL. 1994.

W. T. O'Connell, G. K. Thiruvathukal, and T. W. Christopher. ***Distributed Memo: An Environment to Support Heterogeneous Parallel and Distributed Processing***. International Conference on Parallel Processing '94 (ICPP '94). St. Charles, IL. 1994.

W. T. O'Connell, G. K. Thiruvathukal, and T. W. Christopher. ***Distributed Memo: Heterogeneously Distributed Directories of Unordered Queues***. Sixth ISMM/ IASTED Conference on Parallel and Distributed Computing Systems. Washington, DC. 1994.

G. K. Thiruvathukal. ***Toward Scalable Parallel Software: An Active Object Model and Library to Support von Neumann Languages***. First International Workshop on Parallel Processing. Bangalore, India. 1994.

W. T. O'Connell, G. K. Thiruvathukal, and T. W. Christopher. ***Distributed Memo: Heterogeneously Distributed Directories of Unordered Queues***. International Journal of Mini and Microcomputers. 1997.

I.T. Foster, G. K. Thiruvathukal, and S. Tuecke. *Technologies for Ubiquitous Supercomputing: A Java Interface to The Nexus Communication system*. Concurrency: Practice and Experience, June 1997.

I.T. Foster, J. Geisler, G. K. Thiruvathukal, and S. Tuecke. ***Wide Area MPI***. To appear in a special-issue journal edited by Roy Williams of Caltech.

G. K. Thiruvathukal, L. S. Thomas, and A. T. Korczynski, Reflective Remote Method Invocation, To appear in *Concurrency: Practice and Experience*, mid-1998, and in *Proceedings of ACM Workshop on Java for High-Performance Computing*, February 28, 1998.

I.T. Foster, G. Laszewski, G. K. Thiruvathukal, and B. Toonen, *A Computational Framework for Telemedicine*, To appear in a special issue of Future Generation Computing Systems Journal, Elsevier Press, edited by A. Marsh, Spring 1998.

G.K. Thiruvathukal, The Active/Java Distributed Object Framework, Invited paper for a special issue of the Future Generation Computing Systems Journal, Elsevier Press, edited by W. Gentzch, Summer 1998.

Short Papers

G. K. Thiruvathukal and T. W. Christopher, *A Simulation of Demand-Driven Dataflow: Translation of Lucid into Message Driven Computing Language. IEEE International Parallel Processing Symposium '91 (IPPS '91)*. Anaheim, CA. 1991.

Poster Sessions

G. K. Thiruvathukal, W. T. O'Connell, and T. W. Christopher. *Toward Scalable Parallel Software: Interfacing von Neumann and non-von Neumann Programming Environments*. Society for Industrial and Applied Mathematics Parallel Processing Conference. San Francisco, CA. 1995.

W. T. O'Connell, G. K. Thiruvathukal, and T. W. Christopher. *Distributed Memo Programming Language and System Architecture*. Supercomputing '94. Washington, DC. 1994.

G. K. Thiruvathukal. *Toward Scalable Parallel Software: Itinerant Actors, Dataflow with Macro-Operations, and Object-Brokering*. First Workshop on Charm and Message-Driven Execution Environments. University of Illinois. 1994.

Many of these papers are available in PostScript and Portable Document Format on the World Wide Web at *http://www.jhpc.org/george*.

Special Recognition

Highline Community College Mathematics Department Award
Lewis University Academic Excellence Award, College of Arts and Science
Lewis University Departmental Award in Computer Science
Sigma Pi Sigma Physics National Honor Society
Tuition Scholarship, Assistantships, and Instructorship, IIT, for entire studies
Argonne National Laboratory Graduate Research Assistantship
NSF Research Experience for Undergraduates, University of New Hampshire
Argonne Math and Computer Science Summer Institute in Parallel Processing
Program Committee: ACM Workshop on Java for High-Performance Computing
Program Committee: Parallel and Distributed Processing, Technologies, and Applications Conference 1998.

George K. Thiruvathukal

References

Professor Philip J. Hatcher
Professor and Chair
University of New Hampshire
Computer Science Department
Durham, New Hampshire
Phone: 603.862.3778
E-Mail: pjh@cs.unh.edu

Dr. Gregor von Laszewski
Computer Scientist
Java and High-Performance Computing Group Co-Principal Investigator
Argonne National Laboratory
Mathematics and Computer Science Division
Argonne, IL 60439
Phone: 630.252.0472
E-Mail: gregor@mcs.anl.gov

Dr. William T. O'Connell
Distinguished Member of Technical Staff
AT&T Bell Laboratories
Murray Hill, New Jersey
Phone: 908.582.3093
E-Mail: wto@research.att.com

Professor Klaus E. Schauser
Assistant Professor
Department of Computer Science
University of California, Santa Barbara
Santa Barbara, California 93106
Phone: 805.893.3926
E-Mail: schauser@cs.ucsb.edu

Ph.D. Advisor

Professor Thomas W. Christopher
Associate Professor
Department of Computer Science
Illinois Institute of Technology
Chicago, IL 60616
Phone: 312.567.5070
E-Mail: tc@charlie.cns.iit.edu