

Curriculum Vitae

Joseph E. Hummel, PhD

Date of Birth: June 28, 1962

Citizenship: USA

Research Associate Professor

Department of Computer Science
University of Illinois, Chicago
851 S. Morgan Street, 1120 SEO
Chicago, IL 60607-7053

Phone: (312) 996-3422

Email: jhummel2@uic.edu

Web: <http://www.cs.uic.edu/>

Independent Consultant and President

Joe Hummel Inc.
Wilmette, IL 60091

Phone: (312) 498-6019

Email: joe@joehummel.net

Web: <http://www.joehummel.net/>

Technical Staff

Pluralsight, LLC
182 N. Union Ave
Farmington, UT 84025

Phone: (801) 784-9007

Email: drjoe@pluralsight.com

Web: <http://www.pluralsight.com/>

EDUCATION

1990 – 1998	Ph.D.	Information and Computer Science Research area: Parallelizing Compilers University of California, Irvine
1984 – 1986	M.S.	Computer Science Research area: System Software University of Michigan
1980 – 1984	B.S.	Computer Science and Mathematics Honors: Magna cum laude, Phi Beta Kappa Allegheny College

[1987 – 1990 : full-time instructor at Willamette University, Salem OR.]

PROFESSIONAL AND SCHOLARLY SOCIETIES

Member of ACM (1982), IEEE (1986), and Phi Beta Kappa (1984).

AWARDS

UIC Silver Circle teaching award, U. of Illinois, Chicago: 2015.

Microsoft MVP (Most Valuable Professional) award: 2013, 2014, 2015.

Recipient of **William L. Dunn Award** for outstanding teaching and scholarly promise,
Lake Forest College: 2003.

SERVICE

2015-present	U. of Illinois, Chicago Director of Undergraduate Studies for Department of CS. Serving as undergraduate point of contact for a large department with over 700 undergraduate majors.
--------------	--

SELECTED CONSULTING / PROFESSIONAL EXPERIENCES

- 2001 - present **Pluralsight LLC, Farmington UT**
Curriculum development and training for Microsoft in the areas of (1) high-performance computing, (2) multicore parallelization, and (3) general .NET software development.
- 2003 - 2013 **Hewitt Aon, Chicago IL**
Training and consulting in the general area of software development on the Microsoft platform.
- 2007-2013 **Microsoft Corporation, Redmond WA**
Developed curriculum around high-performance and multicore programming using Windows HPC Server 2008, Visual C++, and .NET. Delivered this curriculum as one and multi-day workshops throughout the USA and around the world.
- 2010 - 2011 **Partners Healthcare / Harvard Medical, Boston MA**
Training and consulting for multicore and cluster-based parallelization of virtual colonoscopy software.
- 2010 **Freeborn and Peters LLP, Chicago IL**
Expert witness on software patent case involving smart phones and embedded operating systems.

THESIS RESEARCH

Thesis: *Data Dependence Testing in the Presence of Pointers and Pointer-Based Data Structures*, Alex Nicolau (Chair), Lubomir Bic, and Laurie Hendren.

Data structures are important solution components, in particular since the choice of data structure can greatly impact the performance of an application. Often this choice is a pointer-based data structure, such as a linked-list, binary tree, or DAG. My thesis is that there exists a significant amount of unexploited independence within such structures, which translates into additional optimization and parallelization opportunities for the compiler. The dissertation presents a new and general framework for data dependence testing in the presence of pointers and pointer-based data structures, and demonstrates its effectiveness on real applications.

RESEARCH EXPERIENCE

2011 - 2013

U. of California Irvine, Irvine, CA
Department of Computer Science

New languages and compilers for multicore and cluster-based high-performance computing systems, including cloud execution.

2010 - 2011

Partners Healthcare / Harvard Medical, Boston MA

Parallelization of existing algorithms, and development of new parallel algorithms, for virtual colonoscopy on multicore and cluster hardware.

2002 - 2010

Lake Forest College, Lake Forest, IL
Department of Mathematics and Computer Science

A variety of undergraduate research projects, including:

- 1) Research in the area of HPC (high-performance computing), in particular new programming language support for cluster-based supercomputers.
- 2) Research on Data Structure Visualization, as part of the college's Richter Scholar program. Research project on unit testing for time analysis, entitled "*NTimeUnit: Testing Software with Respect to Execution Time.*", published in regional MICS conference (April 2006).
- 3) Research on creating a platform-independent IDE (integrated development environment) for Microsoft .NET; part of Lake Forest College's Richter Scholar program.
- 4) Research focusing on development of new algorithms for the exploitation of VLIW-like computer architectures, in particular

Intel's Itanium; part of Lake Forest College's Richter Scholar program.

1998 – 2000

University of Illinois, Chicago

Department of Electrical Engineering and Computer Science

Assistant professor and co-PI in Computer Systems lab, focusing on compiler technology for optimization and program correctness.

1992 – 1998

University of California, Irvine

Department of Information and Computer Science

Graduate student researcher in optimizing and parallelizing compilers.

1993

Intel Corporation (Santa Clara, CA)

1992

University of Illinois, Urbana-Champaign (CSRSD)

1992

Fibonacci Research Institute (Trento, Italy)

1985 – 1986

University of Michigan (CITI)

Two-month internship in Pentium optimizing compiler group; one-month research opportunity in parallelizing compiler group; one-month research opportunity in the area of parallelizing compilers; graduate student researcher in computer networking.

TEACHING EXPERIENCE

- 2013 – present **U. of Illinois, Chicago**
Department of Computer Science
Research Associate Professor, teaching a wide-range of courses in CS.
- 2011 – 2013 **U. of California Irvine**
Department of Computer Science
Visiting researcher, teaching digital design, compiler design, and other courses for undergraduate and graduate students.
- 2001 – 2010 **Lake Forest College**
Department of Mathematics and Computer Science
Associate professor, teaching undergraduate courses in Computer Science, and the Freshman Seminar.
- 1998 – 2000 **University of Illinois, Chicago**
Department of Electrical Engineering and Computer Science
Assistant professor, teaching both undergraduate and graduate courses in Compiler Design and Computer Architecture.
- 1990 – 1997 **University of California, Irvine** (Dept of ICS, and Extension Program)
1987 – 1990 **Willamette University** (Dept of CS)
1984 – 1987 **University of Michigan** (Dept of CS)
Lecturer and teaching assistant for various undergraduate and graduate courses.

REFERENCES

- Alex Nicolau**
Ph.D. Department of Information and Computer Science
University of California, Irvine
Irvine, CA 92697
phone: (714) 824-4079
email: nicolau@ics.uci.edu
- Laurie Hendren**
Ph.D. School of Computer Science
McGill University
3480 University Street
McConnell Engineering Building Room 318
Montreal, QC, Canada H3A 2A7
phone: (514) 398-7391
email: hendren@cs.mcgill.ca
- Constantine Polychronopoulos** Center for Supercomputing Research and Development
Ph.D. University of Illinois, Urbana-Champaign
Computer and Systems Research Laboratory
MC 228
1308 West Main St.
Urbana, IL 61801
phone: (217) 244-4144
email: cdp@csrd.uiuc.edu
- George Struble**
Ph.D. Department of Computer Science
Willamette University
Salem, OR 97301
phone: (503) 370-6300
email: gstruble@willamette.edu
- Michael Wolfe**
Ph.D. The Portland Group, Inc.
9150 SW Pioneer Ct., Suite H
Wilsonville, OR 97070
phone: (503) 682-2806
email: mwolfe@pgroup.com

PUBLICATIONS

Books

- 2003 **Building Applications and Components with Visual Basic .NET**,
T. Pattison and J. Hummel
Addison-Wesley publishing, Oct 2003, ISBN 0-201-73495-8.
- 2001 **Effective Visual Basic: How to Improve Your VB/COM+ Apps**,
J. Hummel, T. Pattison, J. Gethland, D. Turnure and B. Randell
Addison-Wesley publishing, June 2001, ISBN 0-201-70476-5.

Short-cuts (50-page published “books”)

- 2006 **LINQ: The Future of Data Access in C# 3.0**,
Joe Hummel
O’Reilly Publishing, Oct 2006, ISBN 0596528418.

Journal Articles and Book Chapters (Peer Review)

- 2012 **The Working Programmer: The Science of Computers**,
T. Neward and J. Hummel,
Microsoft Journal for Developers, 27(7):80-83.
- 2000 **An Annotation-aware Java Virtual Machine Implementation**,
A. Azevedo, A. Nicolau and J. Hummel,
Concurrency: Practice and Experience, 12(6):423-444.
- 1998 **A Systematic Approach to Branch Speculation**,
G. Bilardi, A. Nicolau and J. Hummel,
Lecture Notes in Computer Science 1366 (Proceedings of the 12th
International Workshop on Languages and Compilers for Parallel
Computing), Z. Li, P.-C. Yew, S. Chatterjee, C.-H. Huang,
P. Sadayappan and D. Sehr (Eds.), Springer, pp. 394-412.
- 1997 **Annotating the Java Bytecodes in Support of Optimization**,
J. Hummel, A. Azevedo, D. Kolson and A. Nicolau,
Concurrency: Practice and Experience, 9(11):1003-1016.

- 1996 **A Simple Mechanism for Improving the Accuracy and Efficiency of Instruction-level Disambiguation,**
S. Novack, J. Hummel and A. Nicolau,
Lecture Notes in Computer Science 1033 (Proceedings of the 10th International Workshop on Languages and Compilers for Parallel Computing), C. Huang, P. Sadayappan, U. Banerjee, D. Gelernter, A. Nicolau and D. Padua (Eds.), Springer, pp. 289-303.
- 1995 **Path Collection and Dependence Testing in the Presence of Dynamic, Pointer-Based Data Structures,**
J. Hummel, L. Hendren and A. Nicolau,
Languages, Compilers and Run-Time Systems for Scalable Computers (Proceedings of the 3rd Workshop), B. Szymanski and B. Sinharoy (Eds.), Kluwer, pp. 15-27.
- 1992 **Abstract Description of Pointer Data Structures: An Approach for Improving the Analysis and Optimization of Imperative Programs,**
J. Hummel, L. Hendren and A. Nicolau,
ACM Letters on Programming Languages and Systems (now a part of ACM TOPLAS), 1(3):243-260.

Conference Articles (Peer Review)

- 2006 **NTimeUnit: Testing Software with Respect to Execution Time,**
J. Hummel et al, submitted for publication.
- 2004 **Generic Data Access in Microsoft .NET: a Compelling Example of Inheritance, Interfaces, and the Factory Method Design Pattern,**
J. Hummel,
Design Patterns and Objects First Workshop, OOPSLA, October.
- 1999 **Java Annotation-aware Just-In-Time (AJIT) Compilation System,**
A. Azevedo, A. Nicolau and J. Hummel,
ACM Java Grande Conference, June.
- 1997 **Annotating the Java Bytecodes in Support of Optimization,**
J. Hummel, A. Azevedo, D. Kolson and A. Nicolau,
ACM Workshop on Java for Science and Engineering Computation (held in conjunction with ACM SIGPLAN PPOPP).

- 1997 **Annotating and Optimizing the Java Bytecodes,**
J. Hummel, A. Azevedo, D. Kolson and A. Nicolau,
Workshop on Security and Efficiency Aspects of Java, in Eilat, Israel
(part of MASCOTS-97, the Fifth International Symposium on Modeling,
Analysis and Simulation of Computer and Telecommunication Systems).
- 1994 **A Framework for Data Dependence Testing in the Presence of
Pointers,**
J. Hummel, L. Hendren and A. Nicolau,
Proceedings of the 23rd Annual International Conference on Parallel
Processing (ICPP), pp. 216-224.
- 1994 **A General Data Dependence Test for Dynamic, Pointer-Based
Data Structures,**
J. Hummel, L. Hendren and A. Nicolau,
Proceedings of the 1994 ACM SIGPLAN Conference on Programming
Language Design and Implementation (PLDI), pp. 218-229.
- 1994 **A Language for Conveying the Aliasing Properties of Dynamic,
Pointer-Based Data Structures,**
J. Hummel, L. Hendren and A. Nicolau,
Proceedings of the Eighth International Parallel Processing Symposium
(IPPS), pp. 208-216.
- 1992 **Applying an Abstract Data Structure Description Approach to
Parallelizing Scientific Pointer Programs,**
J. Hummel, L. Hendren and A. Nicolau,
Proceedings of the 21st Annual International Conference on Parallel
Processing (ICPP), pp. 100-104.
- 1992 **Abstractions for Recursive Pointer Data Structures: Improving the
Analysis and Transformation of Imperative Programs,**
L. Hendren, J. Hummel and A. Nicolau,
Proceedings of the 1992 ACM SIGPLAN Conference on Programming
Language Design and Implementation (PLDI), pp. 249-260.
- 1989 **Xinu/WU: An Improved PC-Xinu Clone,**
J. Hummel,
Proceedings of the 20th SIGCSE Technical Symposium on Computer
Science Education, 21(1):226-230.

GRANTS

- 2015-2016 **U. of Illinois Special Projects Grant**
Purchase and distribute laptops for use in classroom teaching, in particular to enhance the effectiveness of live peer instruction in the classroom.
- Summer 2007 **Microsoft .NET Academic Workshop Grants**
Design, development and hosting of a one-week academic workshop on "Modern Computer Science with Microsoft .NET." Held on the campus of the U. of Evansville, Evansville IN.
- Summer 2006 **Microsoft .NET Academic Workshop Grants**
Design, development and hosting of a one-week academic workshop on "Modern Computer Science with Microsoft .NET."
- Summer 2005 **Microsoft .NET Academic Workshop Grants**
Design, development and hosting of a one-week academic workshop on "Modern Computer Science with Microsoft .NET."
- Summer 2004 **Microsoft .NET Academic Workshop Grant**
Design, development and hosting of a one-week academic workshop on "Modern Computer Science with Microsoft .NET."
- December 2003 **Microsoft Hardware Grant**
To upgrade lab server, as well as provide opportunities for web-based software development.
- Summer 2003 **Microsoft .NET Academic Workshop Grant**
Design, development and hosting of two, one-week academic workshops on "Modern Computer Science with Microsoft .NET."
- Summer 2002 **Microsoft .NET Academic Workshop Grant**
Design, development and hosting of a two-week academic workshop on "Real-World Windows Programming in .NET."
- Summer 2002 **Hewlett-Packard Itanium Hardware Access Grant**
Access to Itanium-based server for experimentation & results.
- 1999 – 2000 **NSF Grant in Computer Science**
18-month research grant supporting Java optimization; grant #9974905.
- 1998 – 1999 **University of Illinois Career Research Board (CRB) Grant**
1-year research grant supporting Java optimization.

FELLOWSHIPS

1992 – 1994

DARPA

Two-year fellowship in High-Performance Computing.