

# Joe T. Meehean

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## Education

**University of Wisconsin – Madison**  
PhD. in Computer Science, Aug. 2011  
Advisers: Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau, and Miron Livny

**University of Wisconsin – Madison**  
M.S. in Computer Science, Dec. 2005 **GPA: 4.0**

**University of Wisconsin – Eau Claire**  
B.S. in Comprehensive Computer Science, May 2003 **GPA: 3.67**

## Teaching

### Experience

*9/11 – Present*

**Lynchburg College**  
Assistant Professor of Computer Science

*Fall 2010*

*Summer 2010*

*Summer 2007*

**University of Wisconsin – Madison**  
Guest Lecturer CS202: Introduction to Computation  
Lecturer CS367: Data Structures  
Teaching Assistant CS367: Data Structures

*9/01 – 5/03*

**University of Wisconsin – Eau Claire**  
SACM Student Tutor

## Employment

*9/11 – Present*

**Lynchburg College**  
Assistant Professor of Computer Science

- Taught wide variety of courses
- Conducted student-faculty research
- Coached ACM programming team

*9/07 – 8/11*

**University of Wisconsin – Madison**  
Graduate Student Research Assistant, ADvanced Systems Laboratory (ADSL)

- Designed Harmony multiprocessor scheduling policy analysis tool. Analyzed multiprocessor scheduling policies of Linux schedulers.
- Developed CPU Futures scheduling feedback system. Creates a feedback channel between applications and CPU scheduler to avoid process starvation and allow applications to enforce scheduling goals.
- Analysis of memory thrashing in Linux mail servers.

*9/04 – Present*

Graduate Student Research Assistant, Condor Project

- Prototyped resource-awareness in Condor core components
- Developed unique process identifier frameworks
- Created distributed scheduler rapid deployment tool
- Implemented distributed scheduler migration feature

**Great Lakes Higher Education (Madison, WI)**

Summer 2002

Software Engineer Internship

- Implemented J2EE student loan application network parser. Converts student loans from industry standard network protocol to internal business objects.

6/03 – 9/04

Part-time Software Engineer

- Member of shared software development committee.
- Developed J2EE database caching library, retrofitted software to use new framework
- Documented software architecture

**Student/Faculty Collaborative Research***High Throughput Computing using Scavenged CPU Cycles with Adam Noll*

Each evening, when the last student leaves the lab, hundreds of computers become unused resources for several hours. The goal of our project is to harness these unused compute cycles to conduct scientific research. To accomplish this goal, we have installed the Condor High Throughput Computing (HTC) middleware on a test bed of 18 computers in Hobbs. Installing Condor on this test bed involved several system administration challenges. During this process we even discovered a bug in the Condor software, which the developers at the University of Wisconsin quickly fixed. To illustrate the effectiveness of using Condor to solve computationally expensive problems, we are working on a HTC solution to the game Dots and Boxes. Dots and Boxes is a two player pencil and paper game. The board is a grid of dots and players take turns connecting the dots to create boxes. The winner is the player who completes the most boxes. A complete searchable solution to Dots and Boxes will allow a player to make the optimal move during each turn. Creating this solution would take many months if run on a single machine; using our Condor test bed, we expect to solve this problem in a few weeks.

**Professional Activities**

12/10 – Present	Member ACM Special Interest Group on Computer Science Education (SIGCSE)
1/12 – Present	Avid reader of SIGCSE's Nifty Programming Assignments
9/11 – Present	LC Computer Science Curriculum Review
2/12	Attended SIGCSE Annual Conference
2/12	Reviewed Randy Ribler's Vietnam Education Proposal
10/11	Attended Regional CS professors Lunch
9/10 – 5/11	Attended Delta Teaching Workshops and Seminars
9/08 – 8/11	Member SACM Graduates Anonymous, UW-Madison chapter
9/02 – 5/03	SACM President UW-Eau Claire chapter
1/02 – 9/02	SACM Vice-President UW-Eau Claire chapter

**Service**

9/11 – Present	LC Programming Team coach
9/11 – Present	Faculty Advisor, see below
1/12 – Present	Administrator of LC's High Throughput Computing Cluster
1/12 – Present	Faculty advisor for student system administrators
4/12	Moderator for Student Scholar Showcase
4/12	Senior Thesis Defense Committee, see below
2/12	Interviewer LC Scholarship Competition

**Courses Taught**

Spring '12	Intro. to Computer Science and Structured Programming I (CS142)
Spring '12	Data Structures and Abstraction I (CS241)
Spring '12	Senior Project (CS452)
Spring '12	Programming Languages (CS322)
Spring '12	Independent Study in Computer Science (CS397)
Spring '12	Internship in Computer Science (CS399)
Fall '11	Data Structures and Abstraction II (CS242)
Fall '11	Database Management Systems (CS370)
Summer '10	Introduction to Data Structures (CS367)

**Awards**

Spring '12                      Putting Him/Her Through Award

**Senior Thesis Defense Committee**

Spring '12                      Keith Lester, *Fault-Tolerant Lab Control Software*  
 Spring '12                      Brian Hudson, *A Ninety Dollar Interactive Whiteboard*  
 Spring '12                      Owen Grubbs, *Committee Staffing Software*

**Faculty Advisor**

Nicole M. Mullany  
 Jeremy P. MacDougall

**Research Summary**

My research focuses on the scalability of CPU schedulers in server and cluster environments. The increase of multicore and SMP machines combined with the expanding set of CPU scheduling features means that CPU scheduling in commodity systems is becoming increasingly complex. Under heavy load these schedulers can suffer from pathological behavior, such as process starvation. The goal of my work is to reintroduce predictability and scalability into best-effort CPU schedulers, even under overload.

*Harmony*

Harmony is a technique for extracting the CPU load balancing policy from commodity operating systems. This technique combines high-level synthetic workloads with low-level instrumentation to fingerprint an operating system's multiprocessor scheduling policy. Harmony also aids in detecting performance bugs in the design and implementation of these policies.

*CPU Futures*

CPU Futures is a system designed to enable application control of scheduling for server workloads, even during system overload. CPU Futures contains two novel components: an in-kernel herald that anticipates application CPU performance degradation and a user-level feedback controller that responds to these predictions on behalf of the application. In combination, these two subsystems enable fine-grained application control of scheduling; with this control applications can define their own policies for avoiding or mitigating performance degradation under overload.

**Publications**

*CPU Load Balancing Analysis Using Harmony*, Techreport. With Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau, and Miron Livny.

*CPU Futures: Scheduler support for application management of CPU contention*, Techreport. With Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau, and Miron Livny.

*A Service Migration Case Study: Migrating the Condor Schedd*, Midwest Instructional Computing Symposium 2005 (winner best student paper award). With Miron Livny.

**Invited Talks**

*CPU Load Balancing in Multicore Systems*, ADSL Team Meeting, April 12, 2010  
*Resolving Scheduling Conflicts with CPU Futures*, ADSL Team Meeting February 3, 2010  
*Making Condor Environmentally Aware*, Condor Week 2007  
*Problems in Dynamic Service Deployment*, Condor Week 2006

**References**

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