



University of Washington
Computer Science & Engineering

Moving Ahead Recent Additions to the Faculty

Fall 2006

UNIVERSITY OF WASHINGTON
COLLEGE *of* ENGINEERING
A Community of Innovators

Recent Additions to the University of Washington Computer Science & Engineering Faculty

Dave Bacon, *Research Assistant Professor*
Quantum Computing

Magdalena Balazinska, *Assistant Professor*
Databases, Sensor Data Management, and Systems

James A. Fogarty, *Assistant Professor*
Human Computer Interaction and
Ubiquitous Computing

Tadayoshi Kohno, *Assistant Professor*
Computer Security and Cryptography

Arvind Krishnamurthy, *Research Assistant Professor*
Distributed Systems and Networks

James R. Lee, *Assistant Professor*
Theory of Computation

Yoky Matsuoka, *Associate Professor*
Neurobotics

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Dave Bacon

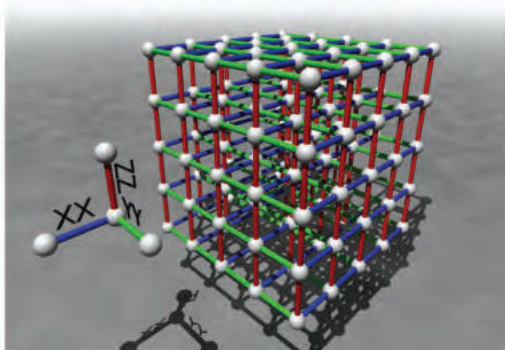
Research Assistant Professor Quantum Computing



Dave Bacon joined the CSE faculty in June 2006. He received his B.S. in physics and in literature with honors from the California Institute of Technology in 1997 and a Ph.D. in theoretical physics from UC Berkeley in 2001. Before arriving at UW, Bacon did post-docs at the Institute for Quantum Information at Caltech at the Santa Fe Institute in New Mexico. Prior to his appointment as a research assistant professor at UW, he was a principal research scientist.

Bacon's research centers on the field of quantum computation. A quantum computer is a new form of computing device which relies on the physics of quantum theory to achieve advantage over classical computers. For example, a quantum computer can efficiently factor integers and hence break most of the widely used public key cryptosystems. In spite of their promise, two major issues face the field of quantum computing and form the core of Bacon's research: how to build a large scale quantum computer, and the search for quantum algorithms beyond the efficient quantum algorithm for factoring integers. Notable recent successes in research have included new quantum algorithms for the non-Abelian hidden subgroup problem and the discovery of a new class of quantum error correcting codes which can be used to considerably increase the provable threshold for fault-tolerant

quantum computation. Bacon's research is theoretical with a strong eye towards practicality and is spread across the disciplines of computer science, physics, and mathematics.



Magdalena Balazinska

Assistant Professor Databases, Sensor Data Management, and Systems

Magdalena Balazinska joined the faculty in January 2006 as an Assistant Professor. She received a Ph.D. from MIT in 2006 and her M.Sc.A. from École Polytechnique de Montréal in 2000.



Balazinska's research interests are broadly in the fields of databases, sensor data management, and systems. She is currently involved in four major projects. The RFID Ecosystem project, a collaboration with Gaetano Borriello, involves deploying and experimenting with a building-wide RFID-based asset and people tracking infrastructure. The goal of the project is to overcome the intrinsic limitations of the RFID technology and provide useful services while respecting users' privacy. The StreamClean project, a



collaboration with Dan Suciu, studies techniques for improving the quality of information produced by applications operating on unreliable sensor data. The goal of the StreamClean project is to develop a system for detecting and correcting input data errors. Because frequently errors cannot be corrected with certainty, the project investigates probabilistic

techniques. The Moirae project explores techniques for complementing real-time monitoring information produced by a Stream Processing Engine (SPE) with different types of historical data. The goal is to exploit large historical data archives in near real-time. Finally, along with Hank Levy and Steve Gribble, she is exploring techniques for helping users organize, protect, and selectively share data in a peer-to-peer environment.

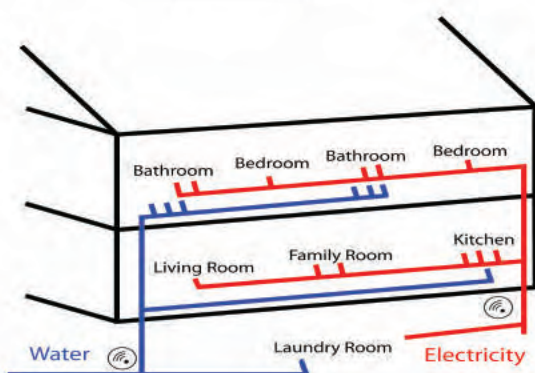
James A. Fogarty

Assistant Professor Human Computer Interaction and Ubiquitous Computing

James Fogarty is an Assistant Professor in Computer Science & Engineering. He joined the faculty in October 2006 after receiving his Ph.D. from the Human Computer Interaction Institute in the School of Computer Science at Carnegie Mellon University, where he worked with Scott E. Hudson. He earned his B.S. in Computer Science at Virginia Tech, where he worked with John Carroll and Mary Beth Rosson.



Fogarty is broadly interested in human computer interaction, user interface software and technology, and ubiquitous computing. Specifically, he is focused on developing, deploying, and evaluating new approaches to the human obstacles surrounding widespread adoption of ubiquitous and intelligent computing technologies. His recent research has investigated unobtrusive and low cost home activity sensing in support of elder care applications, practical approaches to sensor-based statistical models of



A handful of sensors in the basement can reach into the home via existing water pipes and electrical wiring.

human interruptibility, and privacy-sensitive methods for sensing information about the locations people visit. Fogarty believes that human-centered approaches to these types of problems are key to enabling widespread deployment of sensor-based interfaces.

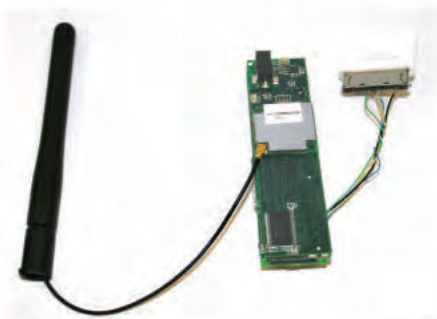
Tadayoshi Kohno

Assistant Professor Computer Security and Cryptography



Tadayoshi Kohno, Assistant Professor, joined the department in the summer of 2006. His research focuses on computer security and privacy, including the theoretical aspects of modern cryptography, systems security, and the interface between computers and society. Kohno received his B.S. in Computer Science from the University of Colorado and his Ph.D. in Computer Science from the University of California at San Diego.

Kohno's principal research goal is to provide a rigorous foundation for the security of modern cryptographic protocols, thereby lifting cryptography from an art to a science and helping ensure that future cryptographic protocols do not suffer from subtle and unexpected bugs. His high-level approach is not unique to his team; indeed, the approach derives from the seminal research in provable security by Goldwasser and Micali and its practice-oriented extension by Bellare and Rogaway. But the perspective is uniquely systems-oriented: the research revolves around the pragmatic constraints of real systems. For example, after discovering a security vulnerability in a portion of the Secure Shell (SSH) protocol, Kohno and his team developed provably secure fixes that are not only compatible with existing artifacts of the SSH protocol, like the internal packet format, but that exploit the presence of these artifacts for security.



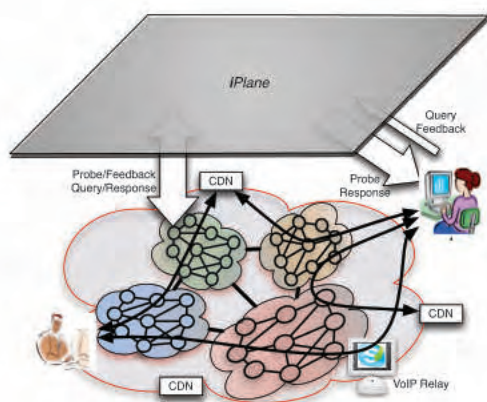
Kohno is also one of the key players in the current national debate on electronic voting security and has presented the results of his research before the U.S. House of Representatives.

Arvind Krishnamurthy

Research Assistant Professor Distributed Systems and Networks



Arvind Krishnamurthy received his Ph.D. from UC Berkeley, was on faculty at Yale, and joined UW faculty in 2005. His research interests are primarily at the boundary between the theory and practice of distributed systems. His recent efforts have been on building iPlane, a scalable information plane for mapping the Internet's structure, predicting its performance, and identifying its trouble spots. He also helped design and implement BitTyrant, a client that exposes BitTorrent's lack of robust incentives. Prompted by this experience, he is engaged in building a universal, swarming-based communication layer that incentivizes users to contribute freely, enabling the over-provisioning of various distributed services.



In the past, he has worked on parallel computing, mechanism design/game theory applied to computer networks, techniques to make RAID's low latency devices, byzantine routing, and distributed storage systems that integrate the numerous ad hoc devices around the home.

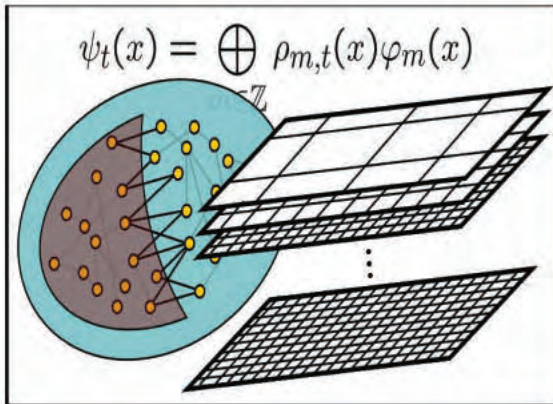
James R. Lee

Assistant Professor Theory of Computation



James Lee is an Assistant Professor in Computer Science & Engineering. He joined the faculty in September 2006, after completing a Postdoctoral Fellowship at the Institute for Advanced Study in Princeton. Lee received his Ph.D. in Computer Science from UC Berkeley in 2005.

He is broadly interested in theoretical aspects of Computer Science, and, in particular, the design and analysis of approximate algorithms for difficult computational problems. His recent research focuses on applying ideas and techniques from high-dimensional geometry and analysis to develop provably effective algorithms for classical problems in graph theory and data clustering. Another of Lee's primary interests lies in the field of geometric



research, where he studies how algorithms can exploit the intrinsic dimensionality properties of massive data sets to uncover hidden structure and run more efficiently.

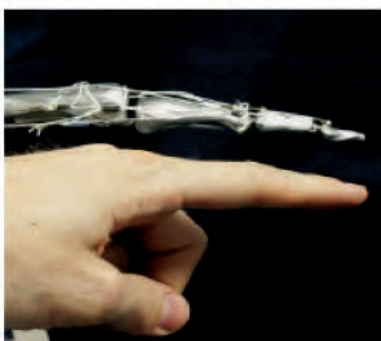
Yoky Matsuoka

Associate Professor Neurobotics



Yoky Matsuoka joined as Associate Professor in September 2006. Previously, she was an Anna Loomis McCandless Assistant Professor in the Robotics Institute, Mechanical Engineering, Biomedical Engineering, and the Center for the Neural Basis of Cognition at Carnegie Mellon University. She received her Ph.D. at MIT in Electrical Engineering and Computer Science in the fields of Artificial Intelligence and Computational Neuroscience in 1998 and a B.S. in EECS from UC Berkeley in 1993. Prior to joining CMU, she was a Postdoctoral Fellow in the Brain and Cognitive Sciences Department at MIT and in Mechanical Engineering at Harvard University. Her work at CMU earned a Presidential Early Career Award for Scientists and Engineers in 2004, Anna Loomis McCandless Professorship in 2004, and IEEE Robotics and Automation Society Early Academic Career Award in 2005.

Matsuoka heads the Neurobotics Laboratory at the University of Washington. Neurobotics is a new field that lies at the intersection of Robotics and Neuroscience. Neurobotics is currently a small community but is growing rapidly in both engineering and science. In the Neurobotics Laboratory,



robotic models and environments are used to understand the biomechanics and neuromuscular control of human limbs. In parallel, robotic systems are developed to augment, replace and rehabilitate damaged sensorimotor functions.



Cover and back photos by Ed LaCasse

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Box 352350
University of Washington
Seattle, WA 98195-2350
<http://www.cs.washington.edu>