



Department of Computer Science
at
The University of Vermont



Faculty Profiles

Fall 2007

A Message from the Chair

It is my pleasure to welcome to you the faculty profiles of the Department of Computer Science at the University of Vermont (UVM). Computer Science is a research-oriented department that aspires to be a center of excellence in teaching computer science at all levels, emphasizing both long-term academic preparation and shorter-term economic importance, as well as excellence in research and graduate education by developing strengths in a small number of focused research areas and by exploiting Computer Science's unique opportunities for collaboration with other strong research areas at the University.

Our faculty in Computer Science is involved in the forefront of research in three thrust areas: computational biology, data mining, and distributed systems, that complement University-wide initiatives in computational sciences, energy/environment, and life sciences, and contribute towards the college-wide spire of excellence in Complex Systems in the College of Engineering and Mathematical Sciences. Our interdisciplinary work cuts across all areas of campus, with current emphasis in bioinformatics and ecological modeling. We publish in prestigious journals and conferences in Computer Science; have significant research grants from federal agencies (such as NSF, NIH, DOD, and DOE); serve on first-rate journal editorial boards, top-tier conference committees, NSF/NIH/DOE review panels, and leading professional societies; and have won international society awards.

The Department currently has nine tenure-track/tenured faculty, two research faculty, and four senior lecturers. This collection of profiles of our faculty will present you with some useful information about this group of scholars and teachers. Along with the dedicated and strong administrative support from Penni French in the Department Office, we believe we have an excellent Computer Science program at UVM.

I hope you enjoy reading this brochure. If you need more information about our faculty or the Department, please visit our department home page at <http://www.cs.uvm.edu/>

Xindong Wu
Professor and Chair

Abdullah N. Arslan

Assistant Professor of Computer Science

Education

Ph.D. Computer Science, University of California, 2002
M.S. Computer Science, University of North Texas, 1996
B.S. Computer Engineering, METU, Turkey, 1990

Research

Algorithms on Strings, Computational Biology

Courses

Analysis of Algorithms
Theory of Computation
Operating Systems



Arslan grew up in a small city in Turkey.

Math and physics courses for him were as much fun as seeing Jurassic Park 1 the first time.

He was no older than 10 when he developed an algorithm to find the square root of any given integer up to any desired decimal position. He did this just because he needed such calculations in his assignments, and there were no electronic calculators (not for him anyway). Then he needed to wait for more than a decade to learn about computers and algorithms.

His biggest dream when he was a teenager was to become a famous soccer player. He became famous maybe locally but his life took a different path when he became a student in a prestigious university in Turkey. After that his life started to become more of a dining philosopher than a sportsman.

Arslan started working for industry when he was a junior in the university. He and one of his classmates developed an authoring tool for a company. After his graduation he worked for the Turkish central bank where he participated in development and maintenance of several in-house software projects.

After spending more than three years in this bank, he made up his mind on pursuing a career in academia. He became a student again. He had always been interested in problem solving before, therefore it was very natural that analysis of algorithms and theory of computation became his main areas of interest during his graduate study. He was fascinated with the problems that arose in computational biology. He developed algorithms for normalized local sequence alignment in his PhD thesis.

Dr. Arslan has developed numerous algorithms for sequence alignment problems. He has also published results on various pattern matching and similarity searching problems, and he introduced new definitions of similarity for linear and multi-dimensional strings.

Selected Publications

- A largest common d-dimensional subsequence of two d-dimensional strings. (2007). *LNCS 4639*, pp. 40-51.
- Regular expression constrained sequence alignment. (*in press*). *Journal of Discrete Algorithms*.
- (with Omer Egecioglu and Pavel A. Pevzner) A new approach to sequence alignment. (2001). *Bioinformatics*, Volume 17, Issue 4, pp. 327-337.

Josh C. Bongard

Assistant Professor of Computer Science

Education

BSc, Computer Science, McMaster University, Canada, 1997

MSc, Evolutionary and Adaptive Systems, University of Sussex, 1999

Ph.D., Computer Science, University of Zurich, 2003

Postdoctoral Associate, Department of Mechanical and Aerospace Engineering, Cornell University 2003-2006



Research Areas

Evolutionary computation, evolutionary robotics, embodied artificial intelligence, system identification, physics-based simulation

Courses

Software Engineering

Human-Computer Interaction

Dr. Bongard has been a member of the computer science faculty since 2006, and brings a wide experience in interdisciplinary research to the University of Vermont. After having conducted research in institutions spanning four countries, and in departments dedicated to traditional computer science (McMaster), the interface between computational science and biology (Sussex), artificial intelligence (Zurich) and robotics (Cornell), Bongard brings a unique perspective to the growing research community in the department. Bongard also gained industry experience when he served as a software engineer for Computing Devices Canada, where he developed communication software for the Canadian army and the U.S. Marines.

In the past year Bongard has been awarded \$392,391 in federal and private grants. He has published 37 research papers, including recent publications in *Science* and the *Proceedings of the National Academy of Science*. Bongard has received several international awards, including being inducted into the 2007 cohort of Microsoft New Faculty Fellows (which includes an unrestricted gift of \$200,000 for establishing a research presence), and being elected one of the TR35 in 2007, MIT *Technology Review* magazine's 35 young innovators under the age of 35.

Bongard's work on resilient machines—robots that can autonomously recover from unanticipated situations—have earned him

international recognition. Bongard and his robot have appeared in both national and international media, including appearances on the *Discovery Channel*, write ups in *Nature* and *Science* news, *USA Today*, and *Slate.com* cited his research as one of the five biggest neuroscience developments of 2007.

Selected Publications

Bongard, J., Zykov, V., Lipson, H. (2006). Resilient machines through continuous self-modeling. *Science*, 314: 1118-1121.

Bongard J. and Lipson H. (2007). Automated reverse engineering of nonlinear dynamical systems. *Proceedings of the National Academy of Sciences*, 104(24): 9943-9948.

Pfeifer R. and Bongard J. (2006) *How the Body Shapes the Way We Think: A New View of Intelligence*, Cambridge, MA: MIT Press.

Current Grants

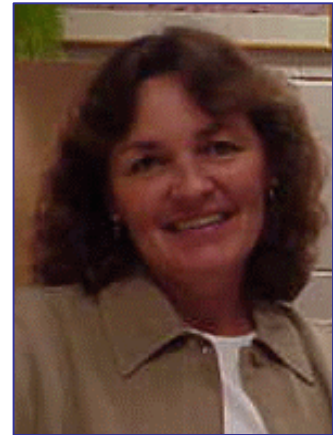
P.I. for a 2007 Microsoft New Faculty Fellowship, Microsoft Research, \$200,000, 6/1/2007—

P.I. for “Exploiting ‘Like Me’ Hypotheses for Learning Robots”, National Science Foundation, \$192,391, 10/1/2007—9/31/2009

Participant, “Complex Systems Modeling for Environmental Problem Solving”, National Science Foundation, \$6,750,000 10/1/2007—9/31/2010

Jeanne Douglas

Senior Lecturer, Computer Science



Education

B.S. Education, Castleton State College, 1973

M.S. Education, Castleton State College, 1976

M.S. Computer Science, University of Vermont, 1985

Courses

Computer Programming I

Computer Programming II

Concepts of Computer Systems

Programming Languages

Jeanne Douglas arrived at the University of Vermont after nearly ten years of teaching Foreign Languages at Rutland Jr./Sr. High School where she was Co-Chair of the Foreign Language Department for a time. She taught French, Spanish and Developmental and Remedial Reading (English).

She served as the Chair of the Local Teacher Certification Agency which reviewed teacher programs for Vermont State Teacher Recertification.

During this time she earned her first Master's Degree in Education including study at the Middlebury College Summer Language Institute, VT.

Subsequently, she held an adjunct position at the College Of St. Joseph the Provider in Rutland, VT., where she developed graduate curriculum for VT Reading Teacher Certification and taught several graduate level courses for elementary and secondary teachers in the teaching of reading (English).

Upon arriving at the University of Vermont in 1982, Ms. Douglas completed a second Master's Degree in Computer Science and immediately began teaching courses in computer literacy and introductory programming. She has taught one or both of the courses in the introductory programming sequence in Fortran, Pascal, C, C++, and Java and has migrated these courses over several platform changes.

Jeanne has been nominated twice for the Kroepsch Maurice Excellence in Teaching Award, the most recent in 2002.

Ms. Douglas serves on the Studies Committee in the College of Engineering and Math, and plays a significant role in student advising for the three undergraduate degree programs in Computer Science. She developed many of the advising tools currently available on the CS Department website.

Margaret J. Eppstein

Assistant Professor of Computer Science
Co-Director, Complex Systems Center

Education

B.S., Zoology, Michigan State University, 1978
M.S., Computer Science, UVM, 1983
Ph.D., Civil & Environmental Engineering, UVM, 1997

Research Areas

Forward and Inverse Modeling and Analysis of Complex Systems in Biological and Environmental Domains

Courses

Parallel Computing
Evolutionary Computation
Modeling Complex Systems

Dr. Eppstein first joined the Computer Science Department at UVM as a lecturer in 1983, and after earning her Ph.D. became a research assistant professor in 1997, a tenure-track assistant professor since 2002, and since 2006 she has been a founding co-Director of the Complex Systems Center. She has published extensively on her work regarding high-dimensionality, nonlinear, multi-scale, tomographic inverse image reconstruction problems in subsurface hydrology, geophysics, and deep-tissue near-infrared fluorescence imaging. Current projects include developing, studying, and using novel evolutionary and agent-based computational approaches for a wide range of important problems, including plant species' invasiveness in ecological communities, biological speciation, the impact of spatial topologies on information flow through complex interaction networks, identifying nonlinear interactions between single nucleotide polymorphisms that predispose for complex disease traits, and agent-based integrated assessment modeling of transportation energy alternatives.

Dr. Eppstein has been awarded \$1,537,705 in research grants and contracts, has published 53 research papers and holds a patent on a new method for Bayesian computed tomography. She has been the recipient of numerous honors and awards, including a National Science Foundation doctoral fellowship, an American Association of University Women Career Development Award, and 3 best-paper awards.

**Selected Publications:**

- Eppstein, M.J., Hawrysz, D.J., Godavarty, A., and Sevick-Muraca, E.M., "Three-dimensional, Bayesian image reconstruction from sparse and noisy data sets: Near-infrared fluorescence tomography", *Proc. Natl. Acad. Sci. USA*, 99(15): 9619-9624, 2002.
- Eppstein, M.J. and Molofsky, J. "Invasiveness in plant communities with feedbacks". *Ecology Letters*, 10:253-263, 2007.
- Eppstein, M.J., Payne, J.L., White, B.C., and Moore, J.H. "Genomic mining for complex disease traits with 'Random Chemistry'", *Genetic Programming and Evolvable Machines*, in press, 2007.

Current Grants:

- P.I. for "Regulatory Control Prediction for Transportation Alternative Energy Usage via a Multiscale Agent-Based Model", University of Vermont Transportation Center, \$330,000 direct, 7/1/2008-6/30/2010.
- Core faculty and significant author on "Complex Systems Thinking and Modeling for Ecosystem Analysis", National Science Foundation EPSCoR RII, \$6,692,531 8/15/07-6/30/10.

Robert Erickson

Senior Lecturer, Computer Science

Education

M.S. Information Systems, Clarkson University, 1991

B.S. Computer Information Systems, Castleton State College, 1987

Research Areas:

Graphical User Interfaces, Menu Design

Courses

CSS for World Wide Web Design

Digital Revolution

Dynamic Data

Introduction to Visual Basic Programming

Introduction to World Wide Web Design

MS Office: Beyond the Basics

Relational Databases for Web Applications



I grew up in the NJ Pine Barrens where I developed a love for the outdoors. After high school I followed my folks up to the mountains of Vermont where I have stayed ever since. My all time favorite activity is back country skiing where ever the wind takes me. If I am not skiing I will be snow-shoeing or snowmobiling.

When the weather warms I look forward to gardening and hiking away in the Green Mountains. In 1993 I hiked the Long Trail from end to end, one of my most memorable journeys. I also enjoy kayaking on the lake and work part time as a canoe guide teaching guests about the amazing beavers that frequent our lakes, ponds and rivers. I am a member of the chaplain kayak club and the green mountain hiking club serving on

various boards and committees over the years.

I am an active mentor in the Community Friends Program working with area children providing guidance, support and really just a good friend to area children.

After spending seven years working for several companies in a wide range of positions the company I worked for closed its doors. I took this opportunity to pursue a masters degree so that I could get involved in teaching, what I really enjoy is helping others to learn. After graduating in 1991 I have been teaching every since and loving every minute of it! I have been nominated five times for the Kroepsch-Maurice Instructional Award since teaching at UVM and received the award in 2007.

Sergey Krivov

Research Assistant Professor, Computer Science

Education

Ph.D. Computer Science, Intercultural Open University, The Netherlands, 1999

M.Sc. Mathematics, Novosibirsk State University, Russia, 1990

Research Areas

Semantic Web technology; Graphic representation and smart navigation of large ontologies; Simulation of ecological and social systems; Probabilistic measures of complexity, organization, and adaptation; Application of Bayesian networks to ecological evaluations



Dr. Krivov came to the US after working as a Consultant for Unitech Infosys, India where he was developing algorithms for analysis of genomes. In 2001 Krivov joined the Ecoinformatics team of the Institute for Ecological Economics in Maryland. He has been working on the NSF sponsored project “A Web-Accessible Knowledge Base for the Integrated Analysis and Valuation of Ecosystem Services.” The Institute moved to UVM in summer 2002 to become the Gund Institute for Ecological Economics.

Ecoinformatics is one of the primary areas, where Dr. Krivov has been focusing his research and development efforts for the last few years. Ecoinformatics characterize the semantics of natural system knowledge. For this reason, much of today's ecoinformatics research relates to the branch of computer science known as knowledge representation, and active ecoinformatics projects are developing links to activities such as the Semantic Web.

Dr. Krivov's major contribution to the research and development of Semantic Web technology is his visual ontology editor GrOWL which he has developed for the NSF sponsored project “Enabling the Science Environment For Ecological Knowledge (SEEK).”

As part of the NSF sponsored “Project ARIES: an Integrated Digital Collaboratory to Support the Economic Valuation of Ecosystem Services,” Dr. Krivov is working on the application of Bayesian Networks technologies to economic valuation of ecosystem services.

Dr. Krivov served as a reviewer for the U.S. Civilian Research and Development Foundation, and for the International Journal of General System, the Ecological Economics journal and several International Conferences.

Selected Publications:

- S. Krivov, R. Williams and F. Villa, GrOWL: A Tool for Visualization and Editing of OWL Ontologies, *Web Semantics: Science, Services and Agents on the World Wide Web* 5, 54–57 (2007)
- F. Villa, M. Ceroni M. and S. Krivov, Intelligent databases assist transparent and sound economic valuation of ecosystem services, *Environmental Management* 39, 887 (2007).
- S. Krivov, R. E. Ulanowicz, and A. Dahiya. Quantitative measures of organization for multiagent systems. *BioSystems*, 69 :39-54 (2003).
- S. Krivov, A. Dahiya, and J. Ashraf. From Equations To Patterns: Logic Based Approach To General System Theory, *International Journal of General Systems* 31(2): 183-205 (2002).

Current Research Grants:

- Co-PI “Project ARIES: an Integrated Digital Collaboratory to Support the Economic Valuation of Ecosystem Services,” National Science Foundation, 2007-2010
- Senior Researcher, “Enabling the Science Environment For Ecological Knowledge (SEEK),” National Science Foundation, 2002-2007
- Senior Researcher, “Ecosystem Services: Dynamics Modeling and Valuation to Facilitate Conservation,” Gordon and Betty Moore Foundation, 2006-2007

Byung S. Lee

Associate Professor of Computer Science

Education

B.S., Electronics Engineering, Seoul National University, 1980

M.S. Electrical Engineering, Korea Advanced Institute of Science and Technology, 1982

Ph.D., Electrical Engineering (Computer Systems Laboratory), Stanford University, 1991

Research Areas

Database query processing

Data stream processing

Wireless sensor networks data management

Courses

Database Systems, Advanced Database Systems,

Data Structures, Algorithms,

Computer Organizations



Dr. Lee joined academia with a decade of experiences in defense and industrial sectors. Since he joined the University of Vermont in 1999, he has been actively pursuing research in the areas of large-scale scientific simulation data exploration, web data caching, XML document storage and retrieval, multidimensional indexing, object-relational database query optimization, and time series processing. His current research focus is in the areas of data stream processing and wireless sensor network data management.

Dr. Lee was a Participating Guest at Lawrence Livermore National Laboratory through his collaboration on a DoE national project, and received a grant from DoE (\$439,917) based on the collaboration. He also received an NSF grant (\$480,000) and a Vermont EPSCoR grant (\$50,000) for projects based on the continuations of the DoE-funded research. He has published 45 papers in reputed journals and conferences, and has one patent pending and one provisional patent filed out of his recent research outcomes.

Dr. Lee's teaching covers mostly systems and algorithms and is characterized by his emphasis on intuitive and practical understanding of the subjects.

Dr. Lee has been active in the professional community as well. He served at fourteen international conferences as a program committee member, a publicity chair, or a special session organizer, and is currently chair of the Workshop on Scalable Stream Processing Systems (SSPS) to be collocated with the

EDBT'08 conference. He also served on the review panels of federal agencies like NSF and DoE, and is on the editorial boards of two international journals (J. Infonomics and J. Comp. Sci & Eng.)

Selected Recent Publications:

- Z. He, X.S. Wang, B.S. Lee, A.C.H. Ling, "Mining Partial Periodic Correlations in Time Series," *Knowledge and Information Systems*. (in press).
- D. Fuchs, Z. He, B.S. Lee, "Compressed Histograms with Arbitrary Bucket Layouts for Selectivity Estimation," *Information Sciences*, 177(3): 680-702, February 2007.
- Z. He, B.S. Lee, R. Snapp, "Self-Tuning Cost Modeling of User-Defined Functions in an Object-Relational DBMS," *ACM Transactions on Database Systems*, 30(3): 812-853, September 2005.
- B.S. Lee, L. Chen, J. Buzas, V. Kannoth, "Regression-Based Self-Tuning Modeling of Smooth User-Defined Function Costs for an Object-Relational Database Management System Query Optimizer," *The Computer Journal*, 47(6): 673-693, November 2004.

Current Research Funding:

- P.I. for "A framework for Optimal Approximate Query Evaluation based on Workload Forecasting", National Science Foundation, 08/01/04--07/31/08 (\$480,000), co-PIs: X. S. Wang, Z. He.

Alan C.H. Ling

Associate Professor of Computer Science

Education

B.Math., Combinatorics and Optimization, University of Waterloo, 1994
M.Math., Combinatorics and Optimization, University of Waterloo, 1995
Ph.D., Combinatorics and Optimization, University of Waterloo, 1997

Research Areas

Combinatorics

Courses

Network Security
Theory of Computation
Computer Architecture
Quantum Computing
Operating System



Dr. Ling received his Ph.D. from the University of Waterloo when he was 23. Since then, he worked as a postdoctoral fellow at various universities. He was an assistant professor in the Michigan Technological University before joining the University of Vermont. Beside various academic experiences, he worked as a credit risk analyst for one year in the Bank of Montreal.

Dr. Ling's research is on combinatorics and its applications into computer science, and he has authored close to 100 journal publications. In his Ph.D. thesis, he pioneered a connection of a combinatorial object, called Steiner triple systems, with erasure codes that are used for redundant inexpensive disk arrays. By drawing the newfound connection, Chee, Colbourn and Ling managed to extend the existing results in the subject. Dr. Ling secured a research grant from the Army Research Office on disk arrays.

Another application of his work is found in bioinformatics. Dr. Ling has used a combinatorial object called balanced binary codes to construct the manufacturing probes for DNA microarray. DNA microarray is a new technology that builds various different DNA sequences into a DNA chip, and it allows a test of blood sample to be done at a fraction of the old cost and in a very time efficient manner. Dr. Ling's work allows the manufacturer to detect if the microarrays function correctly. Recently, Dr. Ling is focused on software testing using a combinatorial object known as covering arrays.

Dr. Ling's research has been recognized by the Institute of Combinatorics and Applications for awarding him a Kirkman medal for his excellent research records in his early career.

Dr. Ling grew up in Toronto. It was his dream to be a professor since he was in high school. He has been

very pleased to be an Assistant Professor and now an Associate Professor at the University of Vermont.

Beside research, Dr. Ling is known to be a motivated teacher. He routinely helps out students whenever they need. He always replies to students' emails promptly, even at 11:00pm on Saturday nights.

Dr. Ling is always working in his office seven days a week and twelve hours a day in order to obtain the next research results, as well as preparing the next classes.

Awards

- Kirkman Medal (2002), Institute of Combinatorics and Applications.

Selected Publications:

- Y.M. Chee, C.J. Colbourn, A.C.H. Ling, Asymptotically optimal erasure-resilient codes for large disk arrays, *Discrete Applied Mathematics* 102 (2000), 3-36.
- C.J. Colbourn, A.C.H. Ling and M. Tompa., Construction of optimal quality control for Oligo arrays, *Bioinformatics*, 18 (2002), 529-535.
- Y.M. Chee, A.C.H. Ling, S. Ling and H. Shen, The PBD-closure of constant nonzero-composition codes, *IEEE Trans. on Inform. Theory* (to appear).
- G. Ge, A.C. H. Ling, Y. Miao, A systematic construction for Radar arrays, *IEEE. Trans. on Inform. Theory* (to appear).
- P. Dukes and A.C.H. Ling, On the asymptotic existence of resolvable graph designs, *Can. Math. Bulletin* (to appear).

Alison Pechenick

Senior Lecturer, Computer Science

Education

B.S. Engineering, Princeton University 1978

M.S. Computer Science, University of Vermont 2003

Ph.D. student, Computational Modeling/Env'l Eng'g

Courses

Programming in MATLAB for Engineers & Scientists

Computer Organization: HW/SW Interface

Visual Basic Programming

Senior Seminar: Ethical Considerations in Technology

Alison has long interwoven careers in technology and technology education. Her experience includes systems analyst for the Hydra-matic division of General Motors and industrial engineer for IBM, technical trainer and network engineer for a technology consulting firm, and technical support staffer for University of Vermont's CIT. In addition, she has taught physics, mathematics, and computer science in Taiwan, Pakistan and Sweden.

Alison's professional interests include ethics and service, the computational aspects of modeling engineering problems, and digital design (hardware-software interface). She has taken several relevant electrical engineering courses at the graduate level and has been an active member of the local IEEE chapter. At present, she is working towards her Ph.D. in environmental engineering, with a focus on computational modeling.

Alison teaches computer organization, required of all CS students, and an elective for engineers. She strives to make these concepts valuable to the engineers, as well as exposing CS students to digital design concepts and trends. Given the relevance of embedded processor design, Alison seeks to engender an appreciation of the overlapping skills these computer scientists and

engineers will share in designing the systems of the future.

She also works with a wide spectrum of students not majoring in computer science/engineering, engaging students from non-technical majors in the popular Visual Basic Programming course, and teaching civil, environmental, and mechanical engineers to appreciate the value of computer science considerations while producing professional analyses in the MATLAB language. With the CS seniors, she explores the ethical questions posed by an increasingly-technical society, and provides a range of service opportunities for their participation.

Alison advises majors, minors, and software certificate participants, is liaison to Continuing Education, and co-advisor to the UVM chapter of Engineers Without Borders. She just completed five years as CEMS representative to the Curricular Affairs Committee of the Senate, coordinating Academic Program Review for UVM. She actively participates in Open Houses and high school outreach programs.

Alison lives in town, appreciates the many attributes of life in Vermont, and is proud to have two sons bearing UVM degrees.



Jackie Redmond

Senior Lecturer, Computer Science

Education

B.S. Electrical Engineering, University of Vermont, 1987

M.S. Computer Science, University of Vermont, 1995

Courses

Computer Programming I

Computer Programming II

Object-oriented Programming

Introduction to Programming

Visual Basic Programming



Jackie first arrived on the UVM campus in the fall of 1987 as an undergraduate Electrical Engineering major. Upon successful completion of that degree, she accepted a position in Quality and Reliability Engineering at Digital Equipment Corporation. In six years at DEC, she held positions including Quality Engineer and Sales Support Engineer.

In 1993, Jackie's desire to pursue the software side of computing brought her back to UVM. She accepted a graduate teaching fellowship from the Department of Computer Science commencing in the fall of 1993. During the two years of study, she provided teaching assistant support for the introductory programming sequence. Her research activities, under the direction of Dr. Sanjoy Baruah focused on scheduling algorithms. Her research concluded with a thesis entitled "Preemptive On-line Scheduling in Overloaded Real-time Systems".

Upon completing her M.S. degree, Jackie returned to industry. A position in IBM

Microelectronics Division was her next venture. Working in microprocessor verification provided the perfect opportunity to combine her engineering and computer science knowledge. Over the next three years, she provided verification support for IBM's Blue Lightning Processor and became leader of the verification team.

In 1998 Jackie decided to pursue a life-long dream of teaching. She was offered a lecturer position in UVM's Computer Science Department. In 2004, she was promoted to Senior Lecturer. Now, in her tenth year in teaching, Jackie teaches primarily courses in the introductory programming sequence. In 2003, she developed a new course, Introduction to Programming, targeted at novice programmers and in the spring of 2008, she will be offering a new "Hands-On Robotics" course. In addition to teaching, her service activities include advising and Open House and Outreach activities, with a special interest in the issue of Women in Computing.

Christian Skalka

Assistant Professor of Computer Science



Education

BA, Philosophy and Mathematics, St. John's College, 1991
MS, Logic and Computation, Carnegie Mellon University, 1997
PhD, Computer Science, The Johns Hopkins University, 2002

Research Areas

Programming Languages, Computer Security, Wireless Sensor Networks

Courses

Programming Languages
Discrete Mathematics

Christian Skalka joined the UVM Department of Computer Science in the fall of 2002. Dr. Skalka earned his PhD in Computer Science at the Johns Hopkins University, where his doctoral research focused on the enforcement of security in programming languages via static (compile-time) analyses, and via type systems in particular.

Prior to his doctoral research, Dr. Skalka received a BA in classical philosophy and mathematics at St. Johns College. He then worked at the Los Alamos National Laboratories and the National Institutes of Health on GenBank, a database serving the Human Genome Project. Returning to academia, he received an MS degree in Logic, Computation and Methodology at Carnegie Mellon University. This progression of professional experience led him to a career in Computer Science research and teaching.

As an assistant professor at UVM, Dr. Skalka has continued his research in programming language-based computer security, establishing fundamental results that have appeared in prestigious journals such as ACM Transactions on Programming Languages and Systems and the Journal of Functional Programming. In recent years Dr. Skalka's work on security mechanisms in programming languages has been supported by a grant from the DoD Air Force Office of Scientific Research.

Dr. Skalka's interest in computer security is one instance of his more general interest in distributed computing systems. He is also involved Wireless

Sensor Networks (WSNs). In particular, his research into snowpack monitoring using WSNs, a collaborative effort with investigators in Engineering and Geography at UVM, is supported by a NASA DEPSCoR exploratory grant.

When Dr. Skalka is not working, he is outdoors enjoying the mountains of New England with his wife Susan.

Selected Publications

- Peter Chapin, Christian Skalka, and X. Sean Wang. *Authorization in Trust Management: Features and Foundations*. To appear in ACM Computing Surveys.
- Christian Skalka, X. Sean Wang, and Peter Chapin. *Risk Management for Distributed Authorization*. Journal of Computer Security 15(4): 447-489, 2007.
- Francois Pottier, Christian Skalka, and Scott Smith. *A Systematic Approach to Static Access Control*. ACM Transactions on Programming Languages and Systems 27(2): 344-382, 2005.

Funded Research

- PI for *Trace Effect Analysis for Software Security*. Funded by USAF, AFRL, Air Force Office of Scientific Research, \$358,185, 06/01/06-05/31/09
- Co-PI for An Exploratory Project to Develop an In Situ Water Equivalent Monitoring System with Improved Spatial Resolution. Funded by NASA DEPSCoR, \$25,000, 07/01/08-6/30/08. Co-PIs: B. Wemple, J. Frolik, T. Neumann.

Robert R. Snapp

Associate Professor

Computer Science, and Mathematics and Statistics



Education

A.B. Physics, UCSD, 1978

Ph.D. Physics, University of Texas, Austin, 1987

Recent Courses

Artificial Intelligence, Computer Graphics, Computers of the Future, Computer Networks, Information & Complexity, Neural Computation, Statistical Pattern Recognition, Puzzles, Games & Algorithms, Stochastic Processes.

Current research interests include statistical pattern recognition, nonparametric statistics, image analysis, neural networks, machine learning, and scientific computing. His current research activities are (i) learning efficient metrics for k nearest neighbor classifiers, (ii) extracting informative features for three-dimensional reconstructions from optical and electron microscope data, (iii) application of Markov random fields to problems in image analysis and ecoinformatics, (iv) pedagogies for introductory computer science.

Before joining the University of Vermont, as an Assistant Professor in Electrical Engineering in 1990, he was a Senior Research Fellow at the California Institute of Technology. He has also held visiting positions at IBM, Rome Laboratory, the Technion, and Lawrence Livermore National Laboratory.

For fun, he plays the piano.

Selected Publications

- “Nuclear remodeling of fibroblasts in stretched and unstretched connective tissue,” with Kirsten N. Storch, Nicole A. Bouffard, Douglas J. Taatjes, and Helene M. Langevin, (in preparation).
- “Teaching graph algorithms in a corn maze,” *Proceedings of the 11th annual SIGSCE conference on Innovation and Technology in Computer Science Education (ITiCSE06)*, 2006, p. 347.
- “Accelerated Kernel Feature Analysis,” with Xianhua Jiang, Robert R. Snapp, Yuichi Motai, and Xingquan Zhu, *Proceedings of the 2006 IEEE Computer Society Conference on Computer Vision and Pattern Recognition*, vol. 1, 2006, pp. 109–116.
- “Self-Tuning Cost Modeling of User-Defined Functions in an Object-Relational DBMS,” with Zhen He, and Byung S. Lee, *ACM Transactions on Database Systems*, vol. 30, issue 3, 2005, pp. 812–853.
- “Asymptotic series representations of the finite-sample risk of k nearest neighbor classifiers,” with Santosh S. Venkatesh, *Annals of Statistics*, **26**, (1998), pp. 850–878.

X. Sean Wang

Dorothean Professor, Computer Science

Education

Ph.D. Computer Science, University of Southern California, 1992

M.Sc. Computer Science, Fudan University, China, 1985

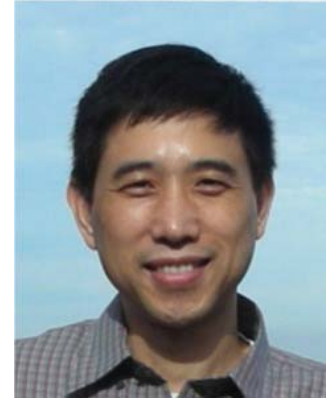
B.Sc. Computer Science, Fudan University, China, 1982

Research Areas

Sensor Networks, Information Security, Scientific and Time Series Data Management, Data mining and Data Warehousing, Database Theory

Courses

Data Structures, Compiler Construction, Advanced Database Systems, Computing Security, Distributed Computing



X. Sean Wang is the Endowed Dorothean Chair Professor of Computer Science at the University of Vermont (UVM), Burlington, Vermont. He obtained his PhD degree in 1992 in Computer Science from the University of Southern California, Los Angeles, California, and earned his MS and BS degrees in Computer Science earlier from Fudan University, Shanghai, China. In 1992, after his study at USC, he joined the faculty of the Information and Software Engineering Department at George Mason University (GMU), Fairfax, Virginia. He went through the ranks of Assistant Professor and Associate Professor (with Tenure) during the years at GMU. In 2003, he moved to UVM as Professor with tenure.

Dr. Wang has taught various courses at both the undergraduate and graduate level, and graduated a number of MS students. He has advised and co-advised 7 PhD dissertations to their satisfactory completion.

Dr. Wang's research areas include database systems, system support for temporal data and time series data, data mining, temporal reasoning, sensor networks, and information security. His research has been continuously supported by NSF since 1994. He is the Principal Investigator or Co-Principal Investigator of 11 sponsored research projects. He was a recipient of both the National Science Foundation's Career and Research Initiation Awards.

Dr. Wang has published widely, with over 100 publications, in the general area of database systems in journals and at conferences such as ACM Transactions on Database Systems (TODS), IEEE Transactions on Knowledge and Data Engineering (TKDE), ACM SIGMOD International Conference on Management of Data (SIGMOD), and Very Large Data Bases Conference (VLDB).

Dr. Wang has served on Program Committees (PC), as PC chairs, or in other capacities for many conference organizations. He is on the editorial boards of three technical journals, namely IEEE TKDE, World-Wide-Web Journal, and Journal of Knowledge and Information Systems.

Selected Publications:

- Peter Chapin, Christian Skalka, and X. Sean Wang. "Trust Management: Features and Foundations", ACM Computing Survey. Accepted for publication. To appear.
- Like Gao and X. Sean Wang, "Continually Evaluating Similarity-Based Pattern Queries on a Streaming Time Series", IEEE Transactions on Knowledge and Data Engineering, 17(10), October 2005, pp. 1320-1332.
- Y. Qu, C. Wang, L. Gao and X. Sean Wang, "Supporting Movement Pattern Queries in User-specified Scales," IEEE Transaction on Knowledge and Data Engineering, 15(1), pp 26-42, 2003.
- C. Bettini, X. Sean Wang and S. Jajodia, "Solving Multi-Granularity Temporal Constraint Networks," in Artificial Intelligence: an International Journal, Elsevier, 140(1-2), pp 107-152, September 2002.
- X. Sean Wang, C. Bettini, A. Brodsky and S. Jajodia, "Logical Design for Temporal Databases with Multiple Granularities," ACM Transactions on Database Systems, Vol 22, pp. 115-170, 1997.

Current Research Grants:

- PI. NSF: "A Context-Aware Approach to the Design and Evaluation of Privacy Preservation Techniques in Location-Based Services." 2007 - 2010.
- PI. NSF: "Privacy-Aware Information Release Control." 2004 - 2008.
- Co-PI. NSF: "A Framework for Optimal Approximate Query Evaluation based on Workload Forecasting." PI: Byung S. Lee. 2004 - 2008.
- Co-PI. NSF: "Controlled Release of Information Based on Contents." PI Sushil Jajodia, GMU. 2003 -2008.

Xindong Wu

Professor and Department Chair, Computer Science

Education

BEng, Computer Science, Hefei University of Technology, 1984

MEng, Computer Science, Hefei University of Technology, 1987

PhD, Artificial Intelligence, Edinburgh University, 1993

Research Areas

Data Mining, Knowledge-Based Systems, Web Information Exploration

Courses

Data Mining, Developing Web Applications in Java, Artificial Intelligence



Dr. Wu comes originally from China. He received his PhD from Edinburgh University in Scotland. Before joining the University of Vermont, he was an Associate Professor in the Department of Mathematical and Computer Sciences at the Colorado School of Mines from August 1998 to August 2001, a Senior Lecturer in the School of Computer Science and Software Engineering at Monash University, Australia, from December 1994 to July 1998, and a Lecturer in the Department of Computer Science at James Cook University, Australia, from July 1993 to November 1994.

He is the Editor-in-Chief of the *IEEE Transactions on Knowledge and Data Engineering* (TKDE, by the IEEE Computer Society), the founder and current Steering Committee Chair of the IEEE International Conference on Data Mining (ICDM), the founder and a current Honorary Editor-in-Chief of *Knowledge and Information Systems* (KAIS, by Springer), the Founding Chair (2002-2006) of the IEEE Computer Society Technical Committee on Intelligent Informatics (TCII), and a Series Editor of the Springer Book Series on *Advanced Information and Knowledge Processing* (AI&KP). He was Program Committee Chair for ICDM '03 (the 2003 IEEE International Conference on Data Mining) and Program Committee Co-Chair for KDD-07 (the 13th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining). He is the 2004 ACM SIGKDD Service Award winner, the 2006 IEEE ICDM Outstanding Service Award winner, and a 2005 Chaired Professor in the Cheung Kong (or Yangtze River) Scholars Programme at the Hefei University of Technology sponsored by the Ministry of Education of China and the Li Ka Shing Foundation. He has been an invited/keynote speaker at numerous international conferences including

NSF-NGDM'07, PAKDD-07, IEEE EDOC'06, IEEE ICTAI'04, IEEE/WIC/ACM WI'04/IAT'04, SEKE 2002, and PADD-97.

Since 1987, Dr. Wu has published extensively in the areas of data mining, knowledge-based systems and Web information exploration, including 18 books and conference proceedings and over 160 refereed papers in various journals and conferences.

Selected Publications:

- Y Zhang and X Wu, Noise Modeling with Associative Corruption Rules, *Proceedings of the 7th IEEE International Conference on Data Mining (ICDM '07)*, Omaha, NE, USA, 2007, 733-738.
- Y Yang, X Wu, and X Zhu, Mining in Anticipation for Concept Change: Proactive-Reactive Prediction in Data Streams, *Data Mining and Knowledge Discovery*, 13(2006), 3: 261-289.
- X Wu, C Zhang, and S Zhang, Database Classification for Multi-Database Mining, *Information Systems*, 30(2005), 1: 71-88.
- X Wu, C Zhang, and S Zhang, Efficient Mining of Both Positive and Negative Association Rules, *ACM Transactions on Information Systems*, 22(2004), 3: 381-405.
- X Wu and D Urpani, Induction by Attribute Elimination, *IEEE Transactions on Knowledge and Data Engineering*, 11(1999), 5: 805-812.
- X Wu, Fuzzy Interpretation of Discretized Intervals, *IEEE Transactions on Fuzzy Systems*, 7(1999), 6: 753-759.
- X Wu, *Knowledge Acquisition from Databases*, Ablex Publishing Corp., U.S.A., 1995.

Current Research Funding:

- Xindong Wu (PI), Abdullah Arslan (Co-PI) and Xingquan Zhu (Co-PI), Pattern Matching with Wildcards and Length Constraints, NSF, CCF-0514819. July 15, 2005 - June 30, 2008.