
University of California at Riverside
Department of Computer Science and Engineering
351 Engineering Building II
Riverside, CA 92521, USA

442 Engineering Building II
Tel: 951-827-2281
Fax: 951-827-4643
E-mail: ciardo@cs.ucr.edu

RESEARCH INTERESTS

- Formal aspects of software engineering, in particular symbolic model-checking algorithms [J23] [J24] [J26] [J31] [P63] [P66] [P68] [P77] [P78] [P84] [P89] [P90] [P91] [P93] [P95] [P102] [P103] [C109] and their parallel and distributed implementation [P87] [P92] [P96] [P97]
- Decision-diagram-based data structures and algorithms [P71] [P74] [P76] [P100] [P101]
- Load balance and performance analysis of Web servers [J18] [J22] [P69] [P70] [P72] [P75] [P83] [M132]
- Distributed algorithms [J12] [J13] [J30] [P85]. compositional techniques [J17] [P55] [P56] [P80] [P81] [M124] [M137], and approximation approaches [J28] [J29] [P67] for the logical and stochastic analysis of large models, including those with discrete-time and general distributions [J10] [J11] [J15] [P51] [P62] [P73] [P82]
- Performance, dependability, and safety evaluation of fault-tolerant and distributed computer systems [J9] [P50] [P52] [P53] [P61] [P94] [P98] [C106] [M122], particularly concurrent software [J6] and avionics applications [P86] [P86]
- Specification formalisms and solution algorithms for modeling tools [J25] [P38] [P54] [P58] [P64] [P79] [C108] [M125] [M128] [M133] [M134], particularly Petri nets [P49] [B114], stochastic Petri nets [J5] [J14] [P44] [P45] [P59] [P57] [C105] [C107] [B111] [B113], timed Petri nets [P99], and unbounded repetitive Markov models [J16] [J19] [J20] [J21] [P60] [P65]

EDUCATION

Apr. 1989 PhD, Duke University, Durham, NC, Department of Computer Science

Thesis: “Analysis of Large Stochastic Petri Net Models” [M117]. Advisor: Dr. Kishor S. Trivedi

July 1982 Laurea *summa cum laude*, Università di Torino, Italy, Dipartimento di Informatica

Thesis: “Le Reti di Petri Stocastiche Generalizzate: uno strumento per la modellizzazione di sistemi distribuiti” [P37] [M116]. Advisor: Dr. Gianfranco Balbo

ACADEMIC POSITIONS

April 2007 Visiting Professor, Laboratoire d’Informatique de Paris 6, Paris, France

July 2003–present Professor, Department of Computer Science and Engineering, University of California at Riverside

January 2004–June 2006 Affiliated Professor, Department of Computer Science, The College of William and Mary, Williamsburg, VA

July 2002–December 2003 Professor, Department of Computer Science, The College of William and Mary, Williamsburg, VA

July 1997–June 2002 Associate Professor, Department of Computer Science, The College of William and Mary, Williamsburg, VA

Aug. 1992–June 1997 Assistant Professor, Department of Computer Science, The College of William and Mary, Williamsburg, VA

Oct. 1999–Dec. 1999 and May 2000 On leave, Visiting Professor at the Università di Torino, Italy
Worked on approximate Markov modeling techniques based on structured state spaces [P67].

Aug. 1992–Dec. 1992 On leave, Visiting Professor at the Institut für Technische Informatik, Technische Universität Berlin, Federal Republic of Germany
Worked on extensions of the Deterministic and Stochastic Petri Net formalism, involving mixtures of exponential and discrete distributions [P47] [P48] and its modeling applications [P46]

OTHER POSITIONS

Jan. 2000–Apr. 2000 Visiting faculty, HP Labs, Palo Alto, CA
Worked on Web traffic models [P70] [P72].

July 1993–Aug. 2000 Consultant, Institute for Computer Applications in Science and Engineering (ICASE), NASA Langley Research Center, Hampton, VA
Worked on reliability and performance models and solution techniques [J17] [M124], non-exponential timing [J11] [P51] [P54] [P59], and distributed approaches [J12] [J13]

Summer 1994 Consultant, HP Labs, Palo Alto, CA
Worked on approximate modeling of communication switches [P53]

Sept. 1988–July 1992 Member Technical Staff, Software Productivity Consortium, Herndon, VA
Responsibilities in this research consortium sponsored by major aerospace and defense companies included research in modeling and technical direction for the specification and design of a hierarchical, hybrid stochastic modeling environment for software and system analysis.

Aug. 1984–Aug. 1988 Research Assistant, Duke University
Primary interests: stochastic processes [J3] [J4], Petri nets [P41], stochastic modeling [P39], performability and logic analysis of systems [J2], and parallel architectures.

June–Aug. 1986 and June–Aug. 1987 Summer internships at IBM T. J. Watson Research Center, Yorktown Heights, NY, supervised by Dr. S. Lavenberg

Sept. 1982–July 1984 Researcher, Database Division, CSELT Research Center, Torino, Italy
Performed research on database interfaces and mappings. Developed a relational interface for CODASYL [J1] [P34] [P35] [P36] [C104].

HONORS AND AWARDS

Invited speaker at PDMC 2009 International Workshop on Parallel and Distributed Methods in verification, Eindhoven, The Netherlands, Nov. 2009

Microsoft Research Cambridge Award for a Paper Co-Authored by a Student at TACAS 2007, to my PhD student Andy Jinqing Yu, for the joint paper [P93]

Keynote speaker at PDMC 2009, Parallel and Distributed Methods in verification, Eindhoven, The Netherlands, Nov. 2009 [J33]

Keynote speaker at EPEW/WS-FM 2005, joint 2nd European Performance Engineering Workshop and 2nd International Workshop on Web Services and Formal Methods, Versailles, France, Sept. 2005 [P88]

Keynote speaker at ATPN 2004, 25th International Conference on Application and Theory of Petri Nets, Bologna, Italy, June 2004 [P84]

Department of Computer Science Nominee for the Margaret Hamilton Professorship, Spring 2003, a university-wide three-year non-renewable term professorship

Keynote speaker at PNPM 2001, joint Petri Nets and Performance Models, Process Algebra and Performance Models, and Probabilistic Methods in Verification Multiconference, Aachen, Germany, Sept. 2001 [P74]

Ten conference articles [P40] [P43] [P48] [P57] [P62] [P77] [P79] [P86] [P93] [P97] invited for publication in extended version in special issues of *IEEE Transactions on Software Engineering* [J2] [J8] [J14], *Performance Evaluation* [J7] [J15] [J25], *Software Tools for Technology Transfer* [J24] [J27] [J31], and *Journal of Logic and Computation* [J30]

IBM Graduate Fellowship, academic years 1985–86 and 1986–87

PATENTS

United States Patent 6,546,473 “Method for cache replacement of web documents”, April 8, 2003. Inventors: Ludmila Cherkasova and Gianfranco Ciardo. Assignee: Hewlett-Packard Company (Palo Alto, CA).

JOURNAL EDITORSHIPS

Jan. 2007–present Member Editorial Board, *Transactions on Petri Nets and Other Models of Concurrency*, Springer-Verlag
(<http://www.springer.com/east/home/computer/lncs?SGWID=5-164-6-417809-0>)

Jan. 2001–Jan. 2005 Associate Editor, *IEEE Transactions on Software Engineering*, [M135]

Sept. 1996 Guest Editor: special issue on stochastic Petri nets, *IEEE Transactions on Software Engineering*, [M126]

STEERING COMMITTEE MEMBERSHIPS

2007–present Petri Nets (PN) www.informatik.uni-hamburg.de/TGI/PetriNets/

2006–present Quantitative Evaluation of Systems (QEST) www.qest.org

2004–present Intl. Workshop on Performability Modeling of Computer and Communication Systems (PMCCS) www.pmccs.net

GRANTS

Sept. 2009–Jan 2011 PI (X. Li Co-PI, CINVESTAV-IPN, Mexico), “Verification of active rule bases using timed Petri nets”, UC-MEXUS, \$25,000

Sept. 2008–Aug 2009 PI, “Symbolic computation of bounds on timing and probabilistic properties of computing systems”, National Science Foundation CCF-0848463, \$74,810

July 2008–June 2009 PI, “Invariant computation using decision diagrams”, UCR Academic Senate (Omnibus grant) \$2,100

July 2007–June 2008 PI, “Techniques for complex, structured, discrete computations”, UCR Academic Senate, \$1,500

Aug. 2006–July 2008 Co-PI (L. Bhuyan, PI, and W. Najjar, Co-PI), “Acquisition of an ultra low-latency multiprocessor system with on-board hardware accelerators”, National Science Foundation CNS-0619223, \$330,000

Sept. 2006–June 2007 PI, “QEST 2006: 3rd International Conference on Quantitative Evaluation of Systems”, University of California Communications Research Program (CORE), \$9,000

Oct. 2004–Sept. 2008 Co-PI (G. Zank, PI, and N. Pogorelov, Co-PI, Department of Physics, University of California at Riverside), “ITR: A multi-scale combined hybrid-magnetohydrodynamic (MHD)-neutral atom code”, National Science Foundation ATM-0428880, \$1,662,650

Sept. 2002–Aug. 2007 PI (W. Stewart, North Carolina State University, co-PI), “Structured methods to evaluate the performance of distributed software”, National Science Foundation ACI-0203971, \$440,445 (total budget, including a \$214,597 subcontract to NC State)

Sept. 2002–Aug. 2006 PI, “ITR: Automated Verification of Asynchronous Software Systems”, National Science Foundation CCR-0219745, \$360,000

Apr. 2002–Sept. 2003 PI, “Formal verification of safety properties for aerospace systems through algorithms based on exhaustive state-space exploration”, National Aeronautics and Space Administration NAG-1-02095, \$154,037

July 2001–July 2004 PI (E. Smirni co-PI), “Effective techniques and tools for resource management in clustered web servers”, National Science Foundation CCR-0098278, \$279,485

May 2000 “Discrete-state systems: Model Checking and Performance Evaluation” (travel and educational grant), Lit. 2,500,000 plus living expenses

Oct. 1999 “Distributed algorithms for the solution of structured Markov models”, Consiglio Nazionale delle Ricerche, Italy (Short-Term Mobility Grant Pos. 140-4 Prot. 048238), Lit. 1,800,000 plus living expenses

March 1999–February 2003 PI, “An advanced hierarchical hybrid environment for reliability and performance modeling”, National Aeronautics and Space Administration NAG-1-2168, \$333,788

Sept. 1995–Aug. 1997 co-PI 1st year (D. Nicol PI), PI 2nd year (D. Nicol co-PI), “Integrated Modeling Project”, CACC subcontract on National Science Foundation EEC-9418765, \$36,500

Dec. 1994–Sept. 1995 PI, “Integrated environment for performance, reliability, and availability modeling”, matching grant from the Center for Innovative Technology, \$39,989

Sept. 1994–Sept. 1995 PI, in collaboration with Genoa Software Systems, Inc., “Integrated environment for performance, reliability, and availability modeling”, Phase I STTR award from the Army Research Office, \$100,000

May 1993–May 1996 co-PI (D. Nicol PI), “Parallel algorithms for the simulation and analysis of stochastic Petri nets”, National Aeronautics and Space Administration, \$248,380

PANELS

May 2003 Dagstuhl Seminar 03201, Probabilistic Methods in Verification and Planning

June 2000 “What is the future for Petri nets in software engineering?”, Workshop on Software Engineering and Petri Nets, Aarhus, Denmark

May 1995 “Non-Markovian Petri Nets”, SIGMETRICS’95, Ottawa [M123]

Dec. 1989 “SPN Applications”, PNPM’89, Kyoto, Japan

Participant in numerous National Science Foundation (NSF) proposal review panels

Proposal reviewer for the U.K. Engineering and Physical Sciences Research Council (EPSRC)

Proposal reviewer for the Netherlands Organization for Scientific Research (NWO)

CONFERENCE ORGANIZATIONS

Sept. 2010 Program Co-Chair, Quantitative Evaluation of Systems (QEST), Williamsburg, VA

Dec. 2006 Program Co-Chair, IEEE Pacific Rim International Symposium on Dependable Computing (PRDC), Riverside, CA [B115]

Sept. 2006 General Chair, Quantitative Evaluation of Systems (QEST), Riverside, CA

June 2005 Program Co-Chair, Intl. Conf. Appl. and Theory of Petri Nets (ATPN), Miami, FL [B114]

Sept. 2003 Program Co-Chair, Petri Nets and Performance Models (PNPM), Urbana-Champaign, IL [B113]

Mar. 2000 Vice Program Chair, IEEE Intl. Computer Performance and Dependability Symposium (IPDS), Chicago, IL

Sept. 1999 Tools Chair, Joint Petri Nets and Performance Models (PNPM), Process Algebras and Performance Models (PAPM) and Numerical Solution of Markov Chains (NSMC), Zaragoza, Spain

June 1999 Organization Chair, Intl. Conf. Appl. and Theory of Petri Nets (ATPN), Williamsburg, VA

Sept. 1998 General Chair, Fourth Intl. Workshop on Performability Modeling of Computer and Communication Systems (PMCCS-4), Williamsburg, VA

Sept. 1998 Vice General Chair, IEEE Intl. Computer Performance and Dependability Symposium (IPDS), Durham, NC

Oct. 1995 Program Co-Chair, Petri Nets and Performance Models (PNPM), Durham, NC [B111]

May 1995 Co-Organizer, Dagstuhl Seminar on Performance and Dependability Modelling with Stochastic Petri Nets, Saarbrücken, Germany [B112]

Sept. 1996 Software Demonstration Chair, IEEE Intl. Computer Performance and Dependability Symposium (IPDS), Urbana-Champaign, IL

Member of the Program Committee:

Sept. 2010 Parallel and Distributed Methods in verification (PDMC), Twente, The Netherlands

June 2010 Intl. Conf. Dependable Systems and Networks (DSN, PDS), Chicago, IL

June 2010 Application of Concurrency to System Design (ACSD), Braga, Portugal

June 2010 Intl. Conf. Appl. and Theory of Petri Nets (ATPN), Braga, Portugal

June 2010 Intl. Workshop on Scalable and Usable Model Checking (SUMo), Braga, Portugal

June 2010 Intl. Workshop on Petri Nets and Software Engineering (PNSE), Braga, Portugal
June 2009 Intl. Conf. Appl. and Theory of Petri Nets (ATPN), Paris, France
Sept. 2009 Intl. Workshop on Practical Appl. of Stoch. Modelling (PASM), London, UK
Sept. 2009 Quantitative Evaluation of Systems (QEST), Budapest, Hungary
July 2009 Application of Concurrency to System Design (ACSD), Augsburg, Germany
June 2009 Intl. Conf. Appl. and Theory of Petri Nets (ATPN), Paris, France
June 2009 Intl. Workshop on Petri Nets and Software Eng. (PNSE), Paris, France
Mar. 2009 SIMUTOOLS, Rome, Italy
June 2008 Application of Concurrency to System Design (ACSD), Xi'an, China
June 2008 Intl. Workshop on Petri Nets and Distributed Systems (PNDS), Xi'an, China
Mar. 2008 Parallel and Distributed Methods in verifiCation (PDMC), Budapest, Hungary
July 2007 Parallel and Distributed Methods in verifiCation (PDMC), Berlin, Germany
Sept. 2007 Quantitative Evaluation of Systems (QEST), Edimburgh, UK
Oct. 2007 IFIP WG 7.3 Symposium (PERFORMANCE) Cologne, Germany
Aug. 2006 Parallel and Distributed Methods in verifiCation (PDMC), Bonn, Germany
June 2006 SIGMETRICS, Saint-Malo, France
June 2006 Intl. Conf. Dependable Systems and Networks (DSN, PDS), Philadelphia, PA
June 2006 Intl. Conf. Appl. and Theory of Petri Nets (ATPN), Turku, Finland
June 2006 European Performance Engineering Workshop (EPEW), Budapest, Hungary
Mar. 2006 Tools and Algor. for the Constr. and Analysis of Syst. (TACAS), Vienna, Austria
Dec. 2005 Pacif Rim Dependable Computing (PRDC), Changsha, Hunan, China
Sept. 2005 Quantitative Evaluation of Systems (QEST), Torino, Italy
July 2005 Intl. Workshop on Practical Appl. of Stoch. Modelling (PASM), Newcastle, UK
June 2005 Intl. Conf. Dependable Systems and Networks (DSN, PDS), Yokohama, Japan
Sept. 2004 Quantitative Evaluation of Systems (QEST), Enschede, The Netherlands
Sept. 2004 Practical Applications of Stochastic Modelling, London, UK
June 2004 Intl. Conf. Dependable Systems and Networks (DSN, PDS), Firenze, Italy
June 2004 Intl. Conf. Appl. and Theory of Petri Nets (ATPN), Bologna, Italy
Sept. 2003 Numerical Solution of Markov Chains (NSMC), Urbana-Champaign, IL
Sept. 2003 Techniques and Tools for Computer Perf. Evaluation, Urbana-Champaign, IL
June 2003 Workshop on Stoch. Petri Nets and Related Formalisms, Eindhoven, The Netherlands
June 2003 Intl. Conf. Dependable Systems and Networks (DSN, PDS), San Francisco, CA
June 2003 Intl. Conf. Appl. and Theory of Petri Nets (ATPN), Eindhoven, The Netherlands
June 2003 SIGMETRICS, San Diego, CA
July 2002 Workshop on Software Performance (WOSP), Rome, Italy
June 2002 Intl. Conf. Dependable Systems and Networks (DSN, PDS), Washington, DC
June 2002 Intl. Conf. Appl. and Theory of Petri Nets (ATPN), Adelaide, Australia
Apr. 2002 Techniques and Tools for Computer Perf. Evaluation, London, UK
Oct. 2001 IEEE Intl. Conf. on Comp. Comm. and Networks (IC³N), Scottsdale, AZ
Sept. 2001 Proc. Alg. Perf. Mod.–Prob. Methods Verif. (PAPM-ProbMIV), Aachen, Germany
Sept. 2001 Petri Nets and Performance Models (PNPM), Aachen, Germany
Aug. 2001 Intl. Conf. Mod. Anal. Simul. Comp. Telecom. Syst. (MASCOTS), Cincinnati, OH
June 2001 Intl. Conf. Appl. and Theory of Petri Nets (ATPN), Newcastle, UK
Oct. 2000 IEEE Symp. on Reliable Distributed Systems (SRDS), Nürberg, Germany

Sept. 2000 2nd Intl. Workshop on Software and Performance (WOSP), Ottawa, Canada
 June 2000 Intl. Conf. Appl. and Theory of Petri Nets (ATPN), Aarhus, Denmark
 Mar. 2000 IEEE Intl. Computer Perf. and Depend. Symp. (IPDS), Chicago, IL
 Mar. 2000 Techniques and Tools for Computer Perf. Evaluation, Chicago, IL
 Oct. 1999 IEEE Symp. on Reliable Distributed Systems (SRDS), Lausanne, Switzerland
 Sept. 1999 Numerical Solution of Markov Chains (NSMC), Zaragoza, Spain
 Sept. 1999 Petri Nets and Performance Models (PNPM), Zaragoza, Spain
 Oct. 1998 1st Intl. Workshop on Software and Performance (WOSP), Santa Fe, NM
 Oct. 1998 IEEE Symp. on Reliable Distributed Systems (SRDS), Purdue University, IN
 June 1998 Intl. Conf. Appl. and Theory of Petri Nets (ATPN), Lisbon, Portugal
 June 1998 12th European Simulation Multiconference, Manchester University, UK
 June 1997 Petri Nets and Performance Models (PNPM), Saint-Malo, France
 Sept. 1996 IEEE Intl. Computer Perf. and Depend. Symp. (IPDS), Urbana-Champaign, IL
 May 1996 SIGMETRICS'96, Philadelphia, PA
 Feb. 1996 Intl. Conf. Mod. Anal. Simul. Comp. Telecom. Syst. (MASCOTS), San Jose, CA
 Jan. 1995 Intl. Conf. Mod. Anal. Simul. Comp. Telecom. Syst. (MASCOTS), Durham, NC
 Jan. 1994 Intl. Conf. Mod. Anal. Simul. Comp. Telecom. Syst. (MASCOTS), Durham, NC
 Oct. 1993 Petri Nets and Performance Models (PNPM), Toulouse, France
 Dec. 1991 Petri Nets and Performance Models (PNPM), Melbourne, Australia [M119]

SOFTWARE TOOLS

SMART, Stochastic Model checking Analyzer for Reliability and Timing. This is a multi-formalism multi-solution tool made publicly available to universities and labs [M125] [M128] [M133] [M134] [P79] [J32]. Currently, it allows numerical solution of large Markov chains using traditional or Kronecker-based techniques, discrete-event simulation of general stochastic models, and CTL model-checking. Future planned enhancements include probabilistic model-checking capabilities and numerical-simulation hybrid solution. A user manual and related information are available on the web [M136].

SPNP, Stochastic Petri Net Package. Designed and implemented as part of doctoral work at Duke University [P38] [P42] [M120]. Distributed to academic and industrial sites throughout the U.S. and Europe.

GSPNA, Generalized Stochastic Petri Net Analyzer. Designed and implemented under contract from the Politecnico di Torino, Italy [P37]. The first tool written for the solution of Generalized Stochastic Petri Nets.

INVITED PRESENTATIONS

Nov. 2009 “Parallel symbolic state-space exploration is difficult, but what is the alternative?”, “International Workshop on Parallel and Distributed Methods in verification (PDMC), invited talk, Eindhoven, The Netherlands. [M140]

Oct. 2009 “Exploiting structural information to improve the analysis of discrete-state systems”, The Hong Kong University of Science and Technology

- Aug. 2009* “Using decision diagrams for the analysis of structured discrete-state models”, University of Savoie, Annecy, France
- Aug. 2009* “Approximate steady-state analysis of large Markov models based on the structure of their decision diagram encoding”, University of Savoie, Annecy, France
- Aug. 2008* “Parallel symbolic algorithms: a challenge” Dagstuhl Seminar No. 08332, Distributed Verification and Grid Computing (H. Bal, L. Brim, M. Leucker, eds.) [M140]
- June 2007* “Static variable ordering and partitioning for symbolic state-space generation”, The University of York, York, UK
- Apr. 2007* “The importance of being structural (better decision diagram algorithms for asynchronous systems)”, Laboratoire d’Informatique de Paris 6, Paris, France
- May 2006* “A general acceleration technique for symbolic state-space generation algorithms”, National Institute for Aerospace, Hampton, VA
- Sept. 2005* “Implicit representations and algorithms for the logic and stochastic analysis of discrete-state systems”, 2nd European Performance Engineering Workshop (EPEW) and 2nd International Workshop on Web Services and Formal Methods (WS-FM), keynote talk, Versailles, France [P88]
- June 2004* “Reachability set generation for Petri nets: can brute force be smart?”, ATPN Conference keynote talk, Bologna, Italy [P84]
- June 2003* “Structural symbolic methods for software verification”, NASA Ames Research Center, Automated Software Engineering group
- May 2003* “Techniques to store Markov chains”, Dagstuhl Seminar No. 03201, Probabilistic Methods in Verification and Planning, (C. Boutilier, B. Haverkort, M. Kwiatkowska, M. Vardi, eds.)
- Dec. 2002* “Some notes on stochastic Petri nets”, Dagstuhl Event No. 02523, Validation of Stochastic Systems (B. Haverkort, ed.)
- Oct. 2002* “Exploiting structural information for efficient symbolic state-space generation”, Carnegie-Mellon University, Department of Computer Science
- Sept. 2001* “What a structural world”, Joint PNPM/PAPM/ProbMIV Multiconference, Aachen, Germany, PNPM keynote talk [P74]
- Oct. 2000* “Analytic modeling of allocation policies for tasks with heavy tail distributions”, Symposium on Advanced Performance Methods 2000, Orlando, FL [M132]
- May 2000* “Using decision diagrams for the solution of large Markov chains”, Dagstuhl Seminar No. 00181, Report No. 273, Probabilistic Methods in Verification (U. Herzog, M. Kwiatkowska, C. Meinel, M. Vardi, eds.)
- April 2000* “Structural approaches for SPN analysis”, High Performance Computing 2000, Washington, DC [P66]
- July 1998* “Distributed and parallel algorithms for state-space generation”, Politecnico di Torino, Torino, Italy
- May 1997* “Kronecker-based solution of large Markov models (with applications to the modeling of distributed software)”, at the Workshop on Software Performance Modeling and Analysis (WOSP), Ottawa, Canada [M127]
- June 1996* “Distributed State-Space Generation of Discrete-State Stochastic Models”, University of Twente, The Netherlands, and University of Aachen, Germany

SHORT COURSES AND TUTORIALS

- June 2007 “Data representation and efficient solution: a decision diagram approach”, 7th International School on Formal Methods for the Design of Computer, Communication and Software Systems: Performance Evaluation, Bertinoro, Italy [C110]
- June 2006 “Symbolic encodings for stochastic processes”, SIGMETRICS, Saint-Malo, France [M139]
- Sept. 2005 “Decision diagrams for logic and stochastic modeling”, QEST, Torino, Italy [M138]
- March 2005 “Decision diagrams and their applications”, Bertinoro International Spring School, Bertinoro, Italy
- Sept. 2004 “Modeling and analysis of Markov chains using decision diagrams”, QEST, Enschede, The Netherlands [M137]
- July 2000 “Distributed and structured analysis”, 1st European Summer School in Trends in Computer Science: Formal Methods and Performance Analysis, Nijmegen, The Netherlands [C109]
- May 2000 “Discrete-state systems: model checking and performance evaluation”, two-week intensive course for doctoral students, Dipartimento di Informatica, Università di Torino
- June 1999 “Tensor based GSPN solutions”, ATPN’99, Williamsburg, VA [M131]
- June 1998 “Kronecker operators for the description and solution of large Markov models”, SIGMETRICS’98, Madison, WI [M130]
- June 1997 “Kronecker operators for the description and solution of large Markov models generated by Stochastic Petri Nets”, joint PNPM’97 and Modelling Techniques and Tools Conferences, Saint-Malo, France [M129]
- May 1994 “Stochastic Petri nets: a formalism to describe stochastic processes”, SIGMETRICS’94, Nashville, TN [M121]
- Oct. 1993 “PNs \Rightarrow SPNs \Rightarrow GSPNs \Rightarrow DSPNs”, PNPM’93, Toulouse, France
- Jan. 1993 “SPNP Theory and Applications”, MASCOTS’93, San Diego, CA
- May 1991 “Putting Stochastic Petri Nets to Work”, a one-day live satellite broadcast course sponsored by the University of Southern California for the National Technical University [M118]

JOURNAL ARTICLES (* and • indicate student and visitor co-authors, respectively)

- [J1] Mauro Bert, Gianfranco Ciardo, Maria Lorenza Demarie, and Cesare Iacobelli. Un’ interfaccia relazionale interattiva per basi di dati reticolari. *Sistemi e Automazione*, pages 707–712, July 1984.
- [J2] Joanne Bechta Dugan and Gianfranco Ciardo. Stochastic Petri net analysis of a replicated file system. *IEEE Trans. Softw. Eng.*, 15(4):394–401, April 1989.
- [J3] Andrew L. Reibman, Kishor S. Trivedi, Sanjaya Kumar, and Gianfranco Ciardo. Analysis of stiff Markov chains. *ORSA J. Comp.*, 1(2):126–133, Spring 1989.
- [J4] Gianfranco Ciardo, Raymond A. Marie, Bruno Sericola, and Kishor S. Trivedi. Performability analysis using semi-Markov reward processes. *IEEE Trans. Comp.*, 39(10):1251–1264, October 1990.
- [J5] Gianfranco Ciardo, Jogesh K. Muppala, and Kishor S. Trivedi. On the solution of GSPN reward models. *Perf. Eval.*, 12(4):237–253, 1991.

- [J6] Gianfranco Ciardo, Jogesh K. Muppala, and Kishor S. Trivedi. Analyzing concurrent and fault-tolerant software using stochastic Petri nets. *J. Par. and Distr. Comp.*, 15(3):255–269, July 1992.
- [J7] Gianfranco Ciardo and Kishor S. Trivedi. A decomposition approach for stochastic reward net models. *Perf. Eval.*, 18(1):37–59, 1993.
- [J8] Gianfranco Ciardo, Reinhard German, and Christoph Lindemann. A characterization of the stochastic process underlying a stochastic Petri net. *IEEE Trans. Softw. Eng.*, 20(7):506–515, July 1994.
- [J9] Jogesh K. Muppala, Gianfranco Ciardo, and Kishor S. Trivedi. Stochastic reward nets for reliability prediction. *Communications in Reliability, Maintainability and Serviceability*, 1(2):9–20, July 1994.
- [J10] Gianfranco Ciardo and Christoph Lindemann. Comments on “Analysis of self-stabilizing clock synchronization by means of stochastic Petri nets”. *IEEE Trans. Comp.*, 43(12):1453–1456, December 1994.
- [J11] Gianfranco Ciardo, Lawrence M. Leemis, and David Nicol. On the minimum of independent geometrically distributed random variables. *Statistics & Probability Letters*, 23:313–326, 1995.
- [J12] David Nicol and Gianfranco Ciardo. Automated parallelization of discrete state-space generation. *J. Par. and Distr. Comp.*, 47:153–167, 1997.
- [J13] Gianfranco Ciardo, Joshua Gluckman, and David Nicol. Distributed state-space generation of discrete-state stochastic models. *INFORMS J. Comp.*, 10(1):82–93, 1998.
- [J14] Gianfranco Ciardo, David Nicol, and Kishor Trivedi. Discrete-event simulation of fluid stochastic Petri nets. *IEEE Trans. Softw. Eng.*, 25(2):207–217, March/April 1999.
- [J15] Gianfranco Ciardo and Guangzhi Li*. Approximate transient analysis for subclasses of deterministic and stochastic Petri nets. *Perf. Eval.*, 35:109–129, 1999.
- [J16] Gianfranco Ciardo and Evgenia Smirni. ETAQA: An efficient technique for the analysis of QBD-processes by aggregation. *Perf. Eval.*, 36-37:71–93, 1999.
- [J17] Peter Buchholz, Gianfranco Ciardo, Susanna Donatelli, and Peter Kemper. Complexity of memory-efficient Kronecker operations with applications to the solution of Markov models. *INFORMS J. Comp.*, 12(3):203–222, 2000.
- [J18] Gianfranco Ciardo, Alma Riska*, and Evgenia Smirni. EQUiLOAD: A load balancing policy for clustered Web servers. *Perf. Eval.*, 46(2-3):101–124, October 2001.
- [J19] Alma Riska*, Evgenia Smirni, and Gianfranco Ciardo. An aggregation-based method for the exact analysis of a class of GI/G/1-type processes. *ACM SIGMETRICS Perf. Eval. Rev.*, 31(2):28–30, September 2003.
- [J20] Alma Riska*, Evgenia Smirni, and Gianfranco Ciardo. Exact analysis of a class of GI/G/1-type performability models. *IEEE Trans. Rel.*, 53(2):238–249, June 2004.
- [J21] Gianfranco Ciardo, Alma Riska*, and Evgenia Smirni. ETAQA-MG1: An efficient technique for the analysis of M/G/1-type processes by aggregation. *Perf. Eval.*, 57(3):235–260, July 2004.
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- [M128] Gianfranco Ciardo and Andrew S. Miner*. SMART: Simulation and Markovian Analyzer for Reliability and Timing. In William H. Sanders, editor, *Tools Descriptions from the 9th Int. Conf. on Modelling Techniques and Tools for Computer Performance Evaluation and the 7th Int. Work. on Petri Nets and Performance Models*, pages 41–43, Saint-Malo, France, June 1997.

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- [M130] Gianfranco Ciardo and Susanna Donatelli. Kronecker operators for the description and solution of large Markov models. In *ACM SIGMETRICS Tutorials*, Madison, Wisconsin, June 1998.
- [M131] Gianfranco Ciardo. Tensor based GSPN solutions. In *Petri Nets '99 Advanced Tutorial on Performance Evaluation Using Stochastic Petri Nets*, Williamsburg, VA, USA, June 1999.
- [M132] Gianfranco Ciardo, Alma Riska*, and Evgenia Smirni. Analytic modeling of allocation policies for tasks with heavy tail distributions. In *Proc. Symp. on Advanced Performance Methods*, Orlando, FL, USA, October 2000. Invited talk.
- [M133] Gianfranco Ciardo, Robert L. Jones*, Andrew S. Miner*, and Radu Siminiceanu*. SMART: Stochastic Model Analyzer for Reliability and Timing. In Peter Kemper, editor, *Tools of Int. Multiconf. Measurement, Modelling and Evaluation of Computer-Communication Systems*, pages 29–34, Aachen, Germany, September 2001.
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- [M136] Gianfranco Ciardo et al. SMART: Stochastic Model checking Analyzer for Reliability and Timing, User Manual. Available at <http://www.cs.ucr.edu/~ciardo/SMART/>.
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- [M138] Gianfranco Ciardo. Decision diagrams for logic and stochastic modeling. In *Tutorials QEST'05*, Torino, Italy, September 2005.
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ACADEMIC COURSES TAUGHT

Graduate courses at the University of California at Riverside:

CS 237 Advanced topics in modeling and simulation: Winter 2006

CS 239 Performance evaluation of computer networks: Winter 2004

CS 246 Advanced verification techniques in software engineering: Spring 2005, Winter 2007, Winter 2008, Fall 2008

CS 260 Seminar in computer science: Fall 2005

Undergraduate courses at the University of California at Riverside:

CS 150 Theory of automata and formal languages: Fall 2005, Fall 2006, Fall 2007, Fall 2008

CS 179K Project in computer science: software engineering: Winter 2005

Undergraduate courses at William and Mary:

CSci 243 Discrete structures in computer science: Fall 1995, Spring 1996, Fall 1997

CSci 421 Database systems: Fall 1998

CSci 423 Finite automata and theory of computation: Spring 1993, Spring 1994, Fall 1994, Spring 1995, Fall 1995, Spring 1997, Fall 1997, Fall 2000, Fall 2001

CSci 435 Software Engineering: Spring 2002

Graduate courses at William and Mary:

CSci 616 Stochastic models in computer science: Fall 1996, Spring 1999, Spring 2001, Fall 2001, Fall 2002

CSci 624 Computer systems performance analysis: Spring 1995

CSci 746 Discrete state stochastic models: Fall 1993, Fall 1994, Spring 1996, Spring 1998, Spring 2001, Spring 2003

STUDENT SUPERVISION

PhD advisor, University of California at Riverside:

Jude Ezeobiejesi

Xiaoqing Jin

Malcolm Mumme

Yang Zhao

Min Wan, 2008

Jinqing “Andy” Yu, 2008

Ming-Ying Chung, 2007

Masters advisor, University of California at Riverside:

Ben Smith

Dhrumil Shah, 2009

Galen Mecham, 2008

Malcolm Mumme, 2008

Min Wan, 2008

Anwar Adi, 2006

John Anderson, 2006

Teddy Matinde, 2006

Piyush Satapathi, 2006

Honomount Rawat, 2005

Member of the PhD defense committee, University of California at Riverside:

Yu Fan

Dennis Jeffrey
Kin Kan
Arun Saha
Hang Li (Electrical Engineering Department)

Member of the MS committee, University of California at Riverside:

Dien-Yen Lin

Member of the PhD qualifying exam, University of California at Riverside:

Atlal El-Assaad
Zi Feng
Monik Khare
Ricky Sethi
Chen Tian
Yonghui Wu
Zhenzhen Ye (Electrical Engineering Department)
Ronald Raymond Dolbin, Jr. (Mathematics Department)
Jeff Pettyjohn (Statistics Department)

Undergraduate research advisor, University of California at Riverside:

Jevons Chen, 2008 (summer internship)
Miguel Rodriguez, 2008 (summer internship)
Diego Villaseñor, 2008 (UC LEADS program)

PhD advisor, William and Mary:

Radu I. Siminiceanu, 2003 (now: Staff Member, National Institute of Aerospace, Hampton, VA)
Robert L. Jones, 2002 (now: Principal Scientist, Sigma Space Corporation, Williamsburg, VA)
Andrew S. Miner, 2000 (now: Associate Professor, Iowa State University)

Masters advisor, William and Mary:

Raymond J. Plante, 2006
Paul L. Grieco, 2003
Hongri Jiang, 2003
Robert M. Marmorstein, 2003
Wei “Helen” Sun, 2002
Michelle M. Griffith, 2000
Arun Mangalam, 2000
Jeff M. Maddalon, 1999
Paul Sugden, 1999
Guangzhi Li, 1998
Dawn M. Galayda, 1997
Xiaochun “Chris” Ji, 1996
Andrew S. Miner, 1995

Undergraduate research advisor, William and Mary:

Eric W. Davis, 2003
Matthew F. Klinger, 2003
Heji Kim, 1995 (Honors, Summa cum Laude)

Research advisor, William and Mary High-School Gifted Student Summer Program:

Amanda Burch, 2003

External committee member:

Massimo Forno, Università di Torino, Italy, 2003 (Laurea)
Marco Gribaudo, Università di Torino, Italy, 2002 (PhD)
Ricardo Fricks, Duke University, North Carolina, 1997 (PhD)
Paolo Marenzoni, Università di Parma, Italy, 1996 (PhD)
James Coleman, University of Adelaide, Australia, 1994 (PhD)
Reinhard German, Technical University of Berlin, Germany, 1994 (PhD)

Member of the Honors committee, William and Mary:

John E. Carro, Brian K. Dewey

Member of the Masters committee, William and Mary:

Vesselin A. Diev
Joshua Gluckman
Regina E. Jeter
Yingjie Lan
Leonidas Linardakis
Nathan T. Moore
Rachel I. Moore
Robert R. Painter
Richard Rummage

Member of the PhD committee, William and Mary:

Anna Brunstrom
Benjamin J. Coleman
Aaron T. Hawkins
Barry G. Lawson
Xiaowen "Jason" Liu
Louis Felipe Perrone
Zvezdan Petkovic
Alma Riska
Diann P. Smith

ACADEMIC SERVICE

Departmental at the University of California at Riverside:

Summer 2008–present Graduate Advisor
Fall 2007–Spring 2008 Member, Graduate Committee
Fall 2004–Spring 2007 Associate Chair
Winter 2004–present Member of several Ad-Hoc Committees
Fall 2004–Spring 2007 Webmaster
Fall 2004–Spring 2005 Member, Hiring Committee

Campus-wide at the University of California at Riverside:

Fall 2008–present Member, Bourns College of Engineering Executive Committee
Winter 2008 Member, Administration and Infrastructure Committee for the Bourns College of Engineering Retreat, responsible for the Facilities Subcommittee

Fall 2005–Summer 2007 Member, Research Computing Advisory Group

November 2005 Session Chair, Southern California Conference on Undergraduate Research (SCCUR)

Departmental at William and Mary:

Fall 2002–Summer 2003 Member, Graduate Curriculum Committee

Fall 2001–Summer 2003 Chair, Graduate Admission Committee

Fall 2001–Summer 2003 Director of Graduate Studies

Fall 2001–Spring 2002 Chair, Faculty Search and Chair Search Committees

Fall 2000–Spring 2001 Chair, Personnel Committee

Fall 2000–Spring 2002 Member, Systems Committee

Fall 1998–Fall 2003 Member, Personnel Committee

Fall 1996–Spring 1999 Webmaster

Spring 1994–Fall 1999 Faculty member responsible for Communications and Publicity

Spring 1995, Spring 1997, Spring 2001 Member, Faculty Hiring Committee

Fall 1995–Spring 1996, Fall 1998–Spring 1999 Member, Curriculum Committee

Spring 1993–Spring 1995 Member, Examination Committee

1994–1998 Judge, departmental competition for the Regional ACM Programming Contest

Campus-wide at William and Mary:

Spring 2002–Fall 2002 Member, Internal Review Team, Biology Department

December 1998–February 1999 Member, Search Committee for the Director of Conference Services

Spring 1996–Fall 1998 Member, Ad-hoc Intellectual Property Policy Committee

ADDITIONAL INFORMATION

Member, ACM (SIGMETRICS)

Senior member, IEEE (Computer Society)

US Citizen

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