

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering

Approved by the Regents
May 14, 2009

Valeria M. Bertacco, assistant professor of electrical engineering and computer science, Department of Electrical Engineering and Computer Science, College of Engineering, is recommended for promotion to associate professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.

Academic Degrees:

Ph.D.	2003	Stanford University, Electrical Engineering, Palo Alto, CA
M.S.	1998	Stanford University, Electrical Engineering, Palo Alto, CA
B.S.	1995	Laurea – Università di Padova, Computer Engineering, Italy

Professional Record:

2003-present	Assistant Professor, Department of Electrical Engineering and Computer Science, University of Michigan
2001-2003	Research Assistant, Stanford University, Palo Alto, CA
1999-2001	Researcher, Advanced Technology Group, Mountain View, CA

Summary of Evaluation:

Teaching: Professor Bertacco has established an outstanding record in all aspects of teaching including classroom instruction, curriculum development, and student mentorship. She has a reputation as an effective and enthusiastic teacher. Her Q1 and Q2 scores are consistently high, with an average rating of 4.33 and 4.60, respectively. Her performance in EECS 370 (Introduction to Computer Organization), a core course in our undergraduate curriculum, has been superb. Her Q1 and Q2 scores in multiple offerings of EECS 370 average 4.65 and 4.66, respectively. Professor Bertacco also implemented a major revision of EECS 578 (Computer Aided Design Verification), which she has reshaped into an advanced course in her area of specialization. She has advised or co-advised three doctoral students who have successfully defended and has another six Ph.D. students in the pipeline.

Research: Professor Bertacco is a highly regarded researcher in the area of hardware verification. Her research is aimed at the investigation of hybrid verification techniques that combine simulation and formal verification methods. Her research on distance-guided simulation has been highly influential, relying on judicious use of formal techniques to guide simulation-based verification. Her recent work on post-silicon verification has attracted significant attention from the research community and practitioners in industry. Professor Bertacco has been a prolific collaborator. She has been an active participant in several research efforts with UM faculty and with others at the University of Illinois at Urbana-Champaign and the University of Texas at Austin. Professor Bertacco has established a stellar record of publication in the prestigious Institute of Electrical and Electronics Engineers (IEEE) and Association for Computing Machinery (ACM) archival journals, and highly competitive computer-aided design conferences (Design Automation Conference, International Conference on Computer Aided Design and Design Automation and Test in Europe). Furthermore, she has been very successful in attracting external support for her research including a highly competitive NSF CAREER Award and two grants from GSRC and SRC industry consortiums. The external letters from prominent researchers in the field are unanimous in their assessment of the quality and impact of her work and long-term research promise.

Recent and Significant Publications:

- Joseph L. Greathouse, Ilya Wagner, David A. Ramos, Gautam Bhatnagar, Todd Austin, Valeria Bertacco and Seth Pettie, "Testudo: Heavyweight Security Analysis via Statistical Sampling," *International Symposium on Microarchitecture*, November 2008.
- Ilya Wagner and Valeria Bertacco, "Reversi: Post-Silicon Validation System for Modern Microprocessors," *IEEE International Conference on Computer Design*, Lake Tahoe, CA, October 2008. (Best Paper Award.)
- Stephen Plaza, Igor Markov and Valeria Bertacco, "Optimizing Non-Monotonic Interconnect using Functional Simulation and Logic Restructuring," *International Symposium on Physical Design*, Portland, OR, April 2008. (Best Paper Award.)
- Ilya Wagner, Valeria Bertacco and Todd Austin, "Using Field-Repairable Control Logic to Correct Design Errors in Microprocessor Pipelines," *IEEE Transactions on Computer-Aided Design*, Volume 27-2, pp. 380-393, February 2008.
- Kai-hui Chang, Igor Markov and Valeria Bertacco, "Automating Post-Silicon Debugging and Repair," *International Conference on Computer-Aided Design*, San Jose, CA, November 2007.
- Ilya Wagner and Valeria Bertacco, "Engineering Trust with Semantic Guardians," *Design Automation and Test in Europe*, Nice, France, April 2007.
- Kypros Constantinides, Smitha Shyam, Sujay Phadke, Valeria Bertacco and Todd Austin, "Ultra Low-Cost Defect Protection for Microprocessor Pipelines," *International Conference on Architectural Support for Programming Languages and Operating Systems*, San Jose, CA, October 2006.
- Smitha Shyam and Valeria Bertacco, "Distance-Guided Hybrid Verification with GUIDO," *Design Automation and Test in Europe*, Munich, Germany, March 2006.
- Valeria Bertacco and Kunle Olukotun, "Efficient State Representation with Symbolic Simulation," *IEEE/ACM Design Automation Conference*, New Orleans, LA, June 2002.

Service: Professor Bertacco has made significant internal and external service contributions to the University and her profession, exceeding the expectations of a junior faculty member. In addition to serving on the Computer Science and Engineering (CSE) graduate admission committee for five years and the CSE Chair Search Advisory Committee last year, she has contributed to diversity and outreach by promoting women in engineering and mentoring female students at all levels. Professor Bertacco has served on the technical program committees of the most prestigious conferences in her area (Design Automation Conference and International Conference on Computer-Aided Design). An invitation to serve on CAD and ICCAD program committees is an indication of her stature in the research community and further evidence of her international reputation. She is currently serving as an associate editor for *IEEE Transactions on Computer-Aided Design*, the top journal in her field. Her role in leading the development of the verification section of the Design chapter in the International Technology Roadmap for Semiconductors was highlighted by several external reviewers as a key indicator of her outstanding reputation.

External Reviewers:

Reviewer A: "Valeria's work on hardware reliability addresses a grand challenge scale problem. ... Her work stands out by bringing together expertise in multiple disciplines, resulting in novel solutions that are far more effective than those considering a narrower range of ideas. ... I consider Valeria's productivity and impact to be at the same level as the best architecture faculty going up for tenure."

Reviewer B: "Overall her publication record is rich, and the quality of the publications is high."

Reviewer C: "A particularly novel and effective aspect of Prof. Bertacco's work is her research on 'hybrid verification' that combines together simulation and formal verification technologies. ... Prof. Bertacco is clearly viewed as an emerging star in the area of embedded system design."

Reviewer D: "I would rate Prof. Bertacco most highly on quality and impact. What strikes me most about her work is her ability to identify important, novel problems before others see them, her creativity in exploring solutions outside of the mainstream research directions pursued by the rest of the community ..."

Reviewer E: "Her work includes traditional simulation based techniques, combines this with emerging formal verification based techniques, and more recently considers microarchitecture solutions. This willingness to go where the problem takes you is impressive and obviously a strong indicator of her long term potential as a researcher."

Reviewer F: "...Valeria has already made a lasting impact, and her most recent work has the potential to fundamentally change the way complex semiconductor circuits are verified for correctness."

Summary of Recommendation: Professor Bertacco has established an exemplary record of teaching, scholarly research and service at the University of Michigan. Her teaching record is excellent at both the undergraduate and graduate levels, and her students consider her a dedicated and enthusiastic teacher and mentor. She has made impressive research contributions in the area of hybrid verification. Through her service, she has made significant contributions to the University and the broader professional community. It is with the support of the College of Engineering Executive Committee that I recommend Valeria Bertacco for promotion to associate professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.



David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering

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