Richard R. Eckert

Department of Computer Science
Thomas J. Watson School of Engineering & Applied Science
Binghamton University
Binghamton, NY 13902

(607) 777-4365
reckert@binghamton.edu
http://www.cs.binghamton.edu/~reckert/

EDUCATION

- Ph.D. in experimental high energy physics, University of Kansas, Lawrence, Kansas (thesis topic: "K-d Interactions at 3.4 GeV/c").
- M.S. in experimental solid state physics (electron spin resonance), University of Kansas, Lawrence, Kansas.
- B.S. in physics (with honors), Case Institute of Technology, Cleveland, Ohio.

EMPLOYMENT HISTORY

1983-PRESENT

- Associate Professor, Department of Computer Science, Thomas J. Watson School of Engineering and Applied Science, SUNY-Binghamton (Tenure Granted, 1986).
- Director, Division of Computer Science-Information Science, School of General Studies and Professional Education, SUNY-Binghamton (1983-1985).
- Research Associate, Air Force Office of Scientific Research Summer Faculty Research Program, Rome Laboratory, Griffiss AFB, NY (Summer, 1997).

1971-1983

- Full Professor of Physics and Computer Science, Catholic University of Puerto Rico, Ponce, Puerto Rico. Taught all courses in Spanish.

1968-1971, 1964-1966

- Graduate Teaching and Research Assistant, Department of Physics, University of Kansas, Lawrence, Kansas.

1966-1968

- Visiting Instructor, Department of Physics, Universidad de Oriente, Cumana, Venezuela (Ford Foundation sponsored exchange program). Taught all courses in Spanish.

INTERNATIONAL

- **International activities at Binghamton University (1985-present):**
    - Was heavily involved in the conception, development, implementation, and revision of a Dual-Diploma Bachelor's Degree Program in Information Systems Engineering between Binghamton University and Bogazici University and Binghamton University and Istanbul Technical University (ITU) in Turkey.

- Chair of the Binghamton University Faculty Senate Executive Committee during the period in which the Dual-Diploma Information Systems Engineering program was being approved. Shepherded it through a lengthy approval process involving meetings with many Binghamton University stakeholders. The key meeting in which the final approval was granted took place after the Senate had recessed for the academic year so it was the Executive Committee, in a meeting with many other important BU players, that made the final decision.
- Visited Turkey on two occasions to interchange ideas with our Turkish counterparts in order to resolve problems and improve the Dual-Diploma Information Systems Engineering program. Met with the coordinators at both universities and also with other administrators and faculty involved in teaching the Dual-Diploma students in Turkey.
- During the first visit was a member of the Binghamton University team that visited two other universities in Izmir, Turkey (Izmir Technical University and Dokuz Eylul University) to investigate the feasibility of starting other exchange or dual-diploma programs with Binghamton University.
- During the second visit, had several day-long meetings with the new ITU program coordinator (shortly after the untimely death of her predecessor, the visionary person from ITU who was instrumental in creating and making the program work on the Turkish side). In these meetings I was able to bring the new ITU coordinator up to speed and ease the transition. The meetings set the stage for future highly productive working meetings involving faculty members who teach in the Dual-Diploma program at all three institutions.
- Was privileged to be able to attend the graduation ceremonies of the first Turkish graduates from the Dual-Diploma Information Systems Engineering program at both Bogazici University and ITU in Istanbul. I still recall with great emotion the pride of the many families of the graduates I met while being a part of something truly special in their lives and the lives of their sons and daughters. My overriding impression was of how successful the program has been. The graduates were greatly respected by their Turkish peers (who initially had been very skeptical), and every one of them received either an outstanding job offer or, in two cases, acceptance and support to continue their academic preparation at very good graduate schools. It was also very moving to me to be involved in the Binghamton University Dual-Diploma graduation activities (also attended by most of the families of the Turkish graduates) and to see how this program has brought the two cultures together in so many ways.
- During that second visit to ITU in Turkey was also able to meet with many computer science researchers. These meetings set the stage for future research collaborations between Binghamton and ITU.
- Was heavily involved in meetings with Turkish visitors to Binghamton on several occasions.
- As Chair of the Faculty Senate and Chair of the Faculty Senate Executive Committee for three years was involved in discussions and decisions impacting many other aspects of international education on the Binghamton University campus.
- As Chair of the Binghamton University Undergraduate Curriculum Committee (UUCC) for many years was involved in issues impacting international educational in the context of the university's general education requirements.
- As an active member of the Binghamton University International Education Advisory Committee was involved in the development and approval of many new study abroad programs.
- Chair of a Foreign Language subcommittee of the UUCC that came up with several innovative alternative methods of fulfilling the General Education foreign language requirement.
- Chaired a second UUCC subcommittee that developed the new General Education Foreign Language requirement for transfer students which was eventually passed by the Faculty Senate.
- Active member of the committee that developed the Binghamton University Certificate in International Studies.

- **Faculty member in the Department of Physics at la Universidad Católica de Puerto Rico (UCPR), in Ponce Puerto Rico (1971-1983):**

  - Helped design, implement and improve the undergraduate physics BS degree program at UCPR.
  - Conceived, designed, and helped implement an accredited two-year Associate Degree program in Digital Electronics and Computer Programming.
  - Developed and taught many courses (in Spanish) in both programs (see below).

- Active in the UCPR faculty governance.
- Coordinator, "First Educational Workshop on Energy," Catholic University of Puerto Rico, Ponce, Puerto Rico; participants from many parts of the world (1976).
- Principal Investigator and Project Director for MBRS-NIH Grant # DRR-08067 (Project 5S), "Atmospheric Particulate as a Public Health Hazard," an undergraduate biomedical research program, funded by the National Heart, Lung and Blood Institute at approximately $80,000 per year; mentor to between 5 and 10 students per year (1979-1983).
- Past President of the Puerto Rican Chapter of the American Association of Physics Teachers.

- **Faculty member in the Department of Physics at la Universidad de Oriente (UDO) in Cumaná, Venezuela**

  - Selected for and participated in a Ford-Foundation sponsored faculty exchange program between the University of Kansas and the UDO (Plan KUUDO). Taught several physics courses (in Spanish) and helped organize the physics undergraduate degree program and laboratories, 1966-1968.

- **Fluent in written and spoken Spanish**

TEACHING

1999-2000 Winner of the "Chancellor's Award for Excellence in Teaching": a SUNY System-wide award

University Courses Taught at Binghamton University:

- Microcontrollers and Robotics (CS-424/580A, advanced undergraduate/graduate)
- GUI and Windows Programming (CS-360, advanced undergraduate)
- Advanced Computer Graphics (CS-660, advanced graduate)
- Computer Graphics (CS-460/560, advanced undergraduate/graduate)
- Computer Organization & Assembly Language Programming, renamed Computer Systems II: Architecture and Programming (CS-220, intermediate undergraduate)
- Microcomputer Systems I (CS-323/523, advanced undergraduate/graduate)
- Advanced Human Computer Interface (CS-380B, advanced undergraduate)
- Introduction to C Programming (CS-244, all undergraduate levels)
- Introduction to Computer Programming (CS-140, introductory undergraduate)
- Introduction to Computer Programming (CS-200, introductory graduate)
- Computer Organization and Architecture I (CS-320, graduate)
- Presidential Scholars Seminar on Web Page development (HARP-330)
- Graduate and Undergraduate Independent Study (many)
- Masters Thesis (many)
- Pre-dissertation Research

High Student Evaluations for all courses taught.

University Courses Taught at Catholic University of Puerto Rico:

- Applied Computer Programming

- Systems Programming
- Assembly/Machine Language Programming
- Scientific Programming in BASIC
- Scientific Applications of Computer Programming
- Practicum in Computer Science Instruction
- Digital Electronics
- Analog Electronics
- Pre-calculus
- Biophysics
- Thermodynamics
- Modern Physics
- Electricity and Magnetism
- Mechanics
- Astronomy
- Optics
- Geology
- General Science
- Science-Man-Society
- Physical Science
- General College Physics
- General College Physics Lab

COURSE DEVELOPMENT/REVISION AT BINGHAMTON UNIVERSITY

- Created the Computer Science Department's Microcontrollers and Robotics course (CS-424/580A).
- Created the Computer Science Department's GUI and Windows Programming course (CS-360).
- Developed the Computer Science Department's graduate computer graphics courses: CS-560 and CS-660 (Advanced Computer Graphics); responsible for a major revision of the undergraduate computer graphics course (CS-460).
- Developed and delivered a Watson School EngiNet (Web-based, remote learning) graduate course in Computer Graphics (CS-560), Spring, 1999; repeated most subsequent Spring semesters.
- Created the Computer Science Department's Introduction to C course (CS-244.
- Developed the Computer Science Department's Microcomputer Systems I course (CS-323/523), a hardware-oriented laboratory course emphasizing the organization of microprocessors and microcomputers based on the 80x86 family of microprocessors. Developed a complete set of laboratory experiments and wrote the Lab Manual.
- Responsible for a major revision of the Computer Science Department's Computer Organization and Assembly Language course (CS-220).
- Responsible for a major revision of the Computer Science Department's Advanced Human Computer Interface course (CS-380B).
- Created the Binghamton Scholars Seminar on Web Page Development (HARP-330).

Courses Created and taught at Catholic University of Puerto Rico: Applied Computer Programming, Systems Programming, Assembly/Machine Language Programming, Digital Electronics, Analog Electronics, Practicum in Computer Science Instruction, Scientific Programming in BASIC, Scientific Applications of Computer Programming.

Courses Revised and taught at Catholic University of Puerto Rico: Biophysics, Thermodynamics, Modern Physics, Electricity and Magnetism, Mechanics, Astronomy, Optics, Geology, General Science, Science-Man-Society, Physical Science, General College Physics, General College Physics Lab.

OTHER PROFESSIONAL ACTIVITIES RELATED TO TEACHING

- Delivered week-long "Visual C++ Programming Workshops" to the Pennsylvania Association of College Information Science Educators (PACISE), Kutztown University, Kutztown, PA, August, 1998 and August, 1999.
- Developed and delivered a Watson School EngiNet (Web-based, remote learning) graduate course in Computer Graphics (CS-560), Spring, 1999.
- Attended several ACM SIGSCE (Special Interest Group on Computer Science Education) National Technical Meetings; paper co-author and session chair (1984-present).
- Attended an Addison-Wesley Java Workshop at Brown University, 1996.
- Attended an ACM/NSF workshop on advanced undergraduate computer graphics in Atlanta, 1994.
- Undergraduate Faculty Enhancement Grant for Computer Graphics winner (1994).
- ACM SIGGRAPH '90 Conference Education Grant winner (one of 25 world-wide).
- Attended ACM SIGGRAPH ‘90 (Dallas); short courses: Fractals-Analysis and Modeling, Generation of 3-D Data for Computer Image Synthesis, Unifying Parametric and Implicit Surface Representations for Computer Graphics.
- Attended ACM SIGGRAPH ‘89 (Boston); short courses: Fundamentals and Overview of Computer Graphics, Radiosity.
- Attended the Wang Institute of Boston University’s Summer Institute in Computer Science (week-long course in computer graphics, 1989).
- Attended Intel Corporation-sponsored iAPX-186, iAPX-286, iAPX-386 Workshops (Washington, Boston, Toronto, 1986).
- Book reviewer for many publishing companies.

RESEARCH

GENERAL RESEARCH INTERESTS

- Computer graphics, human-computer interaction, computer science education, computer architecture, microprocessor-based systems, robotics and microcontrollers. Initiated the computer graphics research program at SUNY Binghamton.

SPECIFIC RECENT RESEARCH INTERESTS

- Graphics Metafile Compositing
- Algorithms for Vector Graphic Optimization and Compression
- Structural Indexing in Automated Embroidery
- Embroidery Stitch Generation Engine
- General Student Models for Intelligent Tutoring Systems
- Robotics in Education

PUBLICATIONS (RESEARCH AND TEACHING)

- More than 35 computer-related (education and research) publications since 1980. Topics include: vector graphic image compression and compositing, using robots in education, classroom of the

future, remote-controlled computer projection system, virtual reality, 3D algorithm animation, multimedia computing (interactive video), virtual environments, interactive drawing, communication between computers and peripherals, development of a hardwired/microprogram-controled computer simulator and tools, microcomputerized professor evaluations, systems programming, biomedical computing, computer assisted instruction/test preparation. They have appeared in: ASEE Conference, CITSA Conference, Eurographics Conference (United Kingdom), GECCO Conference, CGI Conference (China), GVIP Conference (Egypt), ACM SIGCHI Bulletin, ACM SIGCSE Bulletin, Interface, IEEE Transactions on Education, the Journal of Computers in Mathematics and Science Teaching, BYTE Magazine, The Journal of Computers in Mathematics and Science Teaching, 80 Microcomputing, Kilobaud/ Microcomputing, the Physics Teacher, and the International Journal of Biomedical Computing. Also several high energy physics publications in Il Nuovo Cimento.

See attached list of publications.

RESEARCH LABORATORY

- Director of the Computer Science Department's HCI Lab (Human-Computer Interface Lab)--A group of graduate and undergraduate students doing research in HCI and computer graphics.

GRANTS, PROPOSALS, CONSULTING (RESEARCH AND TEACHING)

- Principal Investigator for U.S. Air Force Office of Scientific Research (AFOSR) Summer Research Extension Program (SREP) grant # 240-6636, a grant funded at $25,000: "The Interactive Learning Wall: A PC-Based, Deployable Data Wall for Use in a College Classroom." Salaries provided for one MS Research Assistant and four undergraduate Research Assistants for one year, 1998.
- Research Associate for the Air Force Office of Scientific Research Summer Research Extension Program (SREP), Rome, Laboratory, Rome, New York, June/July, 1997. Did development work on their virtual environment system and set the groundwork for an Education Information Partnership between Rome Laboratory and the Binghamton University Computer Science Department and for a $25,000 SREP grant proposal. The grant was awarded in January, 1998.
- Many Strategic Partnership for Industrial Renovation (SPIR) Projects related to computer graphics (1996-2007). All of these were funded.
- Consultant to Clothing Science Inc., Binghamton, NY, 1993-94; worked on an automated tailoring system; developed a program that builds wireframe models of people being fitted for suits based on camcorder data taken at the fitting; permits interactive viewing of the models.
- MBRS-NIH Consultant (1983-1986).
- Principal Investigator and Project Director for MBRS-NIH Grant # DRR-08067 (Project 5S), "Atmospheric Particulate as a Public Health Hazard," an undergraduate biomedical research program; funded by the National Heart, Lung and Blood Institute at approximately $80,000 per year; mentor to between 5 and 10 students per year (1979-1983).
- Attended several MBRS-NIH National Meetings; co-author of many presented papers (1979-1982).
- In charge of a solar insolation monitoring research project at Catholic University of Puerto Rico, in collaboration with the University of Puerto Rico Engineering College (RUM) and the Puerto Rico Energy Center (1977-80).

PROFESSIONAL ACTIVITIES RELATED TO RESEARCH

- Was an invited participant in the "Microsoft Research Faculty Summit 2005 - Computing: the Next Decade" at the Microsoft Conference Center in Redmond, Washington.
- Was an invited participant in the Microsoft Tech-Ed 2004 Conference in San Diego, California.
- Chaired the Session on Operating Systems at the 1986 National Meeting of the ACM's Special Interest Group on Computer Science Education (SIGCSE).

- Reviewer/referee for ACM SIGCSE National Technical Meetings, IEEE Transactions on Education, and the Symposium on the Frontiers of Massively Parallel Computation.
- Coordinator, "First Educational Workshop on Energy," Ponce, Puerto Rico; participants from many parts of the world (1976).

TECHNICAL/PROGRAMMING SKILLS

- Microsoft Windows (Win32 API, MFC, .NET), UNIX, X-Windows, Motif, Tcl/Tk, DOS, Microsoft Windows (API & MFC, .NET), C, C++, Visual C++, Visual BASIC, Assembler (several), Pascal, FORTRAN, BASIC, COBOL, PL/I, OpenGL, DirectX, PHIGS, Ada, LISP, MODULA-2, HTML, VRML, Java, Java Script, TCP/IP. I have worked with all the above-mentioned languages/ systems and have written programs in all of them.

SABBATICAL ACTIVITIES (SPRING, 1990)

- Attended Cornell University's Computer Science 660 (Machine Vision); attended Ithaca College's Computer Science 315 (Computer Graphics); Attended SUNY's SS 502X (Simple Models of Complex Systems); attended a special course on IBM's OS/2 Operating System; prepared the proposal that led to being one of 25 people world-wide awarded an ACM SIGGRAPH '90 Educators Conference Grant; initiated the development of CS-460 and CS-560 (undergraduate and graduate computer graphics) and CS-244 (Introduction to C Programming); wrote two papers that were subsequently published.

SERVICE

UNIVERSITY SERVICE

- **Chair, Binghamton University Faculty Senate, 2000-2001**
- **Chair, Binghamton University Faculty Senate Executive Committee, 2002-2004**

Other Current and Past Service to Binghamton University:

- **University Level:** President's Task Force on Undergraduate Learning for the new Millennium, Binghamton University Faculty Senate (chair and member for many years), Binghamton University Faculty Senate Executive Committee (chair and member for many years), Binghamton University Faculty Senate University Undergraduate Curriculum Committee (UUCC, chair and member for many years), Binghamton University Faculty Senate Educational Policy and Priorities Committee (EPPC), Binghamton University International Education Advisory Committee (many years), Binghamton University Scholars Advisory Committee (many years), Faculty Senate Committee on Committees, Provost's Committee on University Planning for the Future in Academic Affairs, Chancellor's Award Selection Committee, Committee for the development of a Certificate in International Studies, Faculty Senate Computer Advisory Committee, Faculty Senate Evaluation Coordinating Committee (several years), All University Personnel Committee (several years), Committee that revised the Student Opinion of Teaching form, University Curriculum Development Grant Review Committee, Distinguished Dissertation Awards Selection Committee.
- **Watson School Level:** Watson School Library Committee, Watson School Graduation Committee (many years); Marshal of the Watson School Recognition Ceremony (many years), Watson School Decennial Committee (Computer Science Department Coordinator and Open House exhibit organizer); Watson School Laboratory Planning Committee, Watson School Microprocessor/Digital Electronics Area Lab Planning Committee (Coordinator),
- **Computer Science Department Level:** Computer Science Department Junior Initiating Personnel Committee (JIPC, many years), Computer Science Department Undergraduate Committee (many

years), Computer Science Department Faculty Search Committee (many years), Computer Science Department Library Committee, Computer Science Department Faculty Workload Committee, Member Ph.D. evaluation committees of many students, Member 1988 IEEE Southern Tier Technical Conference Planning Committee (Registration Chairman, chaired a paper session), Computer Science Department Chairman Screening Committee, Computer Science Department Laboratory Planning Committee (Chair), Computer Science Department Faculty Coordinating Group for the Core Cluster (Coordinator) and Coordinating Group for Computer Architecture, active participant in the departmental undergraduate computer science accreditation (CSAB) efforts, active participant in SED reviews of the Computer Science Department Ph.D. program, Computer Science Department Task Force on Software and Computer System Engineering (SACSE), participant in several student advising, registration and phonathon programs, SUNY Parents' Day Lectures, Involved in Computer Science Department and Watson School Open Houses (many times),

- **SGSPE Division Level:** Director SGSPE Division of Computer Science - Information Science (CS-IS), SGSPE Initiating Personnel Committee, SGSPE Faculty Council, CS-IS Academic Standards, Curriculum, Admissions, Industrial Advising Committees, Joint CS-IS (SGSPE)-CS (Watson School) Computer Advisory Committee, CS-IS Faculty Search Committee (Chair), SGSPE CS-IS Intra-University Transfer Student Screening Committee; many other service activities/committees at Catholic University of Puerto Rico.

PROFESSIONAL SOCIETIES, HONORS, AWARDS

- ACM, IEEE Computer Society, Who's Who in the East, American Men & Women of Science, Marquis Who's Who, International Who's Who of Professionals, International Directory of Distinguished Leadership.

COMMUNITY SERVICE (PAST AND PRESENT)

- Elected member of the Susquehanna Valley Central School District's Board of Education; Susquehanna Valley's Trustee on the Broome-Tioga-Delaware Health Insurance Consortium; volunteer manager/coach of several youth baseball, basketball, and soccer teams; volunteer referee for Conklin Youth Sports basketball; volunteer for Susquehanna Valley's SBA youth basketball program; volunteer summer camp tennis camp coach; volunteer driver for Frito Lay/USTA Challenger Tennis Tournament; Cub Scout Den Leader; member/volunteer worker for the Susquehanna Valley Sports Booster Club, member/volunteer worker for the Conklin Youth Sports Booster Club; judge for an intercollegiate debate held at SUNY Binghamton.

HOBBIES

- Reading, writing, music, tennis, running/cycling, fly fishing, gardening.