



Dr. Larry A. Crum, PE
Professor of Computing & Software Systems
Professor of Computer Engineering Systems

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Education:

- PhD: Marquette University (June, 1971)
Dissertation: Multidimensional Laplace Transform Analysis of Nonlinear Systems
- BSEE: The Ohio State University (March, 1964)
Concentration: Design of Control Systems and Computer Systems

Professional Summary:

Dr. Crum has extensive experience in the design of embedded computer systems. He began his professional career designing automatic production equipment, and followed that with the design of inertial navigation and avionics equipment. Embedded computing has remained central to his professional engineering practice, research, and teaching throughout his career. He initiated the Computer Science option in Electrical Engineering at Marquette University in 1968 and began the Computer Science option of Electrical Engineering at the University of Akron in 1971. Dr. Crum was one of six professors who launched the Computer Science program at Wright State University beginning in 1973, and in 1976 led the development of the Computer Engineering option. As Chair of the Department, he gained approval for the Bachelor of Science in Computer Engineering program from the Ohio Board of Regents in 1981. The Computer Engineering program gained full ABET accreditation in 1984, becoming only the second computer engineering program to gain ABET accreditation. Wright State's Computer Science program was one of the early programs accredited by CSAB in 1987. Dr. Crum also led the effort to gain approval for a Master of Science Degree in Computer Engineering program, obtaining approval for it in 1984. In 1987 he gained approval from the Board of Regents for the Ph.D. in Computer Science & Engineering program, the first solicited Ph.D. program at Wright State University. As founder of the Association of Chairs of State of Ohio Computer Science Departments, Dr. Crum led a successful effort to gain multimillion dollar annual funding for Ohio's public/private Centers of Excellence in Computing, and for enhanced funding and endowed professorships for the State Computer Science Departments. In 1999 Dr. Crum became the founding Director of the University of Washington, Tacoma Computing & Software Systems program, and in 2001 became the founding Director of the University of Washington, Tacoma Institute of Technology. The Institute of Technology was created by the Washington State Legislature with \$500,000 initial capital and \$2,000,000 annual budget, with an industry match of \$5,000,000, and federal grants totaling \$350,000. A Master of Science in Computing & Software Systems was approved in 2002, a Bachelor of Arts in Computing & Software Systems approved in 2005, and a Bachelor of Science in Computer Engineering Systems expected to be launched in 2006. Dr. Crum has contributed to the national development of computer curricula, serving

on the ABET Committee for Accreditation Standards for Computer Engineering and serving as Vice Chair of the IEEE Computer Society's Committee of Computer Engineering Department Chairs. He served as Vice Chair of ACM's Annual Conference Committee, which hosted the Annual Computer Science Department Chair's conference. Dr. Crum also served with the Computer Science Accreditation Board (CSAB) from its inception in 1986 until 1994. He has served as a consultant for approximately ten universities, providing advice and evaluation of Computer Science and/or Computer Engineering programs. While Chair of the Wright State University Computer Science & Engineering Department between 1980 and 1989, Dr. Crum brought in more than \$2,000,000 in grants and contracts from industry, and more than \$1,500,000 in grants and contracts from state, military, and other federal government sources.

Professional Positions:

- University of Washington, Tacoma
 - 2006- : Professor, Computer Engineering Systems
 - 1999- : Professor, Computing & Software Systems
 - 2001-05: Director, Institute of Technology
 - 1999-05: Director, Computing & Software Systems Program
- Pacific Lutheran University
 - 1997-99: Visiting Professor, Computer Science & Engineering Department
- Private Practice
 - 1994-97: Consultant - Computer Science & Engineering
- University of Washington (on sabbatical leave from Wright State University)
 - 1992-93: Visiting Scholar, Electrical Engineering / Computer Science & Engineering
- Air Force Institute of Technology (on professional leave from Wright State University)
 - 1976-77: Visiting Professor, Department of Electrical Engineering
Air Force Office of Scientific Research Resident Scientist, Wright Aeronautical Labs
- Wright State University
 - 1994- : Professor Emeritus of Computer Science & Engineering
 - 1993-94: Chair, Department of Computer Science & Engineering
 - 1989 : AFOSR Summer Faculty Research Fellow,
Wright Aeronautical Laboratories - Avionics Laboratory
 - 1989-93: Director, Computer Engineering program
 - 1981-89: Chair, Department of Computer Science & Engineering
 - 1981-94: Professor of Computer Science & Engineering
 - 1978-81: Director, Computer Engineering
 - 1976 : ASEE/USAF Summer Faculty Research Fellow,
Wright Aeronautical Laboratories – Aeromedical Research Laboratory
 - 1975-81: Associate Professor of Computer Science
 - 1975 : NSF Summer Industry Resident, Systems Research Laboratory
 - 1974 : NSF Summer Industry Resident, Cox Heart Institute
 - 1973-75: Assistant Professor of Computer Science
- University of Akron
 - 1971-73: Assistant Professor of Electrical Engineering
- Marquette University
 - 1973 : NSF Summer Visiting Professor
 - 1967-71: Instructor of Electrical Engineering
- AC Electronics Division of General Motors Corporation
 - 1964-67: Senior Project Engineer / Project Engineer / Engineer in Training,
Inertial Guidance & Computer Systems Product Design Engineering

- Pittsburgh Plate Glass Company
1960-64: Plant Engineering, Design of Automated Glass Processing Equipment

Areas of Particular Interest & Expertise:

- Real-Time Embedded Computer Systems: Central to research, application, teaching, and laboratory activities for most of professional career, and a focus of industrial and consulting activities.
- Digital Hardware / Computer Interfacing Design: Developed and maintained a broad capability digital design facility which supported computer assisted design; building, and testing of logic, MSI, and programmed logic devices. Supported by NSF, DEC, Intel, TI, Hewlett Packard, Tektronix, and NCR among others.
- Computer Communication Systems & Protocols: One area of particular emphasis. Developed a laboratory to support design of both hardware and software communications systems which was supported by NSF and industry.
- Microprocessor Systems: Have worked with microprocessors from Intel (and Zilog) 4004 to Pentium chips, from Motorola 6800 to 68000, and a spectrum of support devices. Supported by NSF, and Motorola among others.
- Computer Architecture/Organization: Periodically taught courses in this area throughout academic career. Consulted and have industrial experience in this area.
- Automated Control Systems: Have industrial design experience in this area, and have taught courses in linear and digital control systems. Laboratory was developed with NSF funding.

Grants, Contracts, & Awards:

- US Department of Education funding for UWT Institute of Technology \$100,000 (2001)
- US Department of Housing support for UWT Institute of Technology \$250,000 (2001)
- UWT Institute of Technology local funding \$5,000,000 (2001)
- Sabbatical support for 9 months at the university of Washington (1992-93)
- Teaching Award for Supervision of Outstanding Student Project - NCR Sponsored (1990)
- Microcomputer Project Laboratory Enhancement, NSF Instructional and Laboratory Improvement Program, (with T. Purnhagen) \$73,449 (1989-92)
- AFOSR Summer Faculty Research Fellowship at Wright Patterson Air Force Base (1989)
- College of Engineering & Computer Science Excellence in Professional Service Award (1988-89)
- Faculty Research Support, Reynolds & Reynolds Corp., \$35,000 (1987-88)
- Center for AI Applications, Bid by Miami Valley Consortium of Universities, USAF, (team of numerous representatives from each of five member universities), \$10,000,000 (1987-92)
- Artificial Intelligence Applications, Research Challenge Program, Ohio Board of Regents, (with A. F. Sanders, J. L. Sloan, etc.), \$101,500 (1987)
- Integration of Knowledge Science into Computer Science & Engineering Program, Academic Challenge Program, Ohio Board of Regents, \$615,650 (1986-91)
- Ohio Legislature Special Appropriation for Computer Workstations, \$300,000 (1986-87)
- Distributed Computing, Multiprocess Graphic Workstation Environment Grant, Avionics Laboratory, Wright Aeronautical laboratories, \$500,000 (1985-86)
- Multiprocessor Computer Systems Grant, Reynolds & Reynolds Corp., \$850,000 (1984)
- Real-time Computing Laboratory Grant, Digital Equipment Corp., \$62,500 (1983)
- Computing Literacy Laboratory Grant, NCR Corp, \$35,000 (1983)
- Robotics Laboratory Grant, DEC, ARMCO, MEAD, (with J.E. Brandeberry, WSU Foundation) \$120,000, (1982)
- Computer Graphics Laboratory Grant, DEC, \$25,000 (1982)
- Distinguished Professorship Fund Grant, NCR, \$350,000 (1981-91)
- Real Time Computing Laboratory Grant, DEC, \$20,000 (1981)

- Real Time Computing Laboratory Grant, Vernay Labs, \$14,000 (1980)
- NSF ISEP Grant, "Computer Graphics Laboratory," (with R.D. Dixon, K. Gorowara) \$40,000 (1980)
- Communications Systems Design for an Industrial Data Collection System Contract, Systems Research Laboratory, (with R.D. Dixon) \$30,000 (1979)
- National Science Foundation Grant in Computer Graphics (with R.D. Dixon, A.F. Sanders) \$37,000 (1979)
- National Science Foundation ISEP Grant in Computer Communications (with R.D. Dixon) \$40,000 (1978-1980)
- Studies for Design of Visually Coupled Aircraft Simulator, Aerospace Medical Research Laboratory Contract, System Research Laboratory, (with R.D. Dixon) \$7,000 (1978)
- ASEE/AFOSR Resident Scientist, AFIT/AMRL (1976-1977)
- Computer Engineering Investigations for the AF Aerospace Medical Research Laboratory, Air Force Office of Scientific Research, \$39,000 (1976-1977)
- USAF/ASEE Summer Faculty Research Fellowship at Wright Aeronautical Labs (1976)
- Microprocessor Applications, Systems Research Laboratory, NSF Faculty Industrial Project Grant, \$6,000 (1975)
- Mass Storage System to Support Computer Assisted Diagnosis for Medics and Paramedics, NSF Institutional Grant Subgrant, \$2,000 (1974)
- Computer Assisted Diagnosis with Data Collection, Cox Heart Institute, NSF Faculty Industrial Project Grant, \$5,000 (1974)
- NSF Teaching Professorship, at Marquette University, Summer (1973)
- Outstanding Engineering Teacher Award, Marquette University (1971)
- A Study of Computer Analysis and Decision Making Requirements for Marquette University, Marquette University (Resulted in Esso Foundation Grant), (with J. Heinen and E. Foudriat) (1970)
- Mathematics Association of America Award (1958)

Professional Activities:

- Member of Congressman Adam Smith's Technical Advisory Council (2000 – Present)
- Computer Science Accreditation Board Member and Accreditation Team Member (1986-94)
- Consultant - University Undergraduate and Graduate Program Reviews, Approximately 10 (1986-94)
- Co-chair - ACM Northeast Regional Computer Programming Contest, Wright State University (1989)
- Chair - Ohio Collegiate Computer Science Conference, Wright State University, (1989)
- Panel Chair - 1989 Computer Science Conference, Louisville, KY (1989)
- ACSCEG Committee for Review and Recommendation of ABET Computer Engineering Accreditation Guidelines (1988-89)
- Administrative Committee - IEEE/ACM Supported Association of Computer Science and Computer Engineering Chairs (ACSCEC) (1987-89)
- Session Chair - 1987 Computer Science Conference, St Louis, MO (1987)
- Chair - Committee to Recommend Process for Ohio Board of Regents Review of Computer Science Program Excellence Proposals (1987)
- Program-chair - ACM Committee for Annual Computer Science Conference (1986-89)
- Committee - IEEE Educational Activities Committee to Establish Association of Computer Science and Computer Engineering Chairs (1986-87)
- Chair - ACM Ad Hoc Committee for Review of the Annual Computer Science Conference (1986-87)
- Program Chairman - 1986 ACM 14th Annual Computer Science Conference, Cincinnati, OH (1986)
- Trustee, Applied Information Technologies Research Center (1986 - 1988)
- Trustee, Engineering and Science Foundation of Dayton, (1985 - 1992)
- Competition to locate the Software Productivity Consortium in the Miami Valley Research Park (1984-85)
- Software Engineering Institute Competition Proposal (1984)
- National Educational Computing Conference Arrangements Committee, Dayton, Ohio (1984)
- Acting Trustee, Engineering and Science Foundation of Dayton, (1984)
- Miami Valley Research Park Local Area Network Task Force (1984)

- Organizer and Chair, State of Ohio Computer Science Chairperson Semiannual Meetings (1982-88)
- Consultant for Evaluation of High Tech Industries, State of Ohio Development Financing Commission (1983)
- Session Chairman for Sixteenth Annual Hawaii International Conference on System Sciences (1983)
- Chairman, IEEE Computer Society Dayton Chapter (1981-82)
- Technical Sessions Executive Committee, National Electronics Conference (1980, 1981)
- Session Chairman, National Electronics Conference (1980, 1981, 1982)
- Session Chairman, ASEE North Central Section Conference (1979)
- Chairman, IEEE Automatic Control Society Dayton Chapter (1974-75)
- Chairman, IEEE Automatic Control Society Milwaukee Chapter (1969-70):Program Chairman (1968-69), Vice-Chairman (1967-68), Secretary (1966-67)

Theses Supervised:

- Parallel Processing Using Objective C, Roy Livingston (1994)
- VHDL Specification of a Computer Processing Unit, John Evans (1994)
- A Parallel Computer Based Architecture for Real-Time Closed Loop Simulation, John Schiavone (1992)
- High Speed Data Highway Implementation, Craig Mallory (1992)
- Data Compromise Protection and Data Integrity Assurance Simulation Environment, Ravin Asar (1991)
- Design and Implementation of a MAC Layer LAN Bridge using ISDN, Dan Zuccarelli (1991)
- Design of a Constant Temperature and Flow-Rate Control, Michael J. Rarick (1990)
- Open Systems Interconnection Model Simulation Environment, Aymen Barri (1990)
- Data Compromise Protection and Data Integrity Assurance in an Open Network Environment, Gordon Wishon (1990)
- Software Optimization for an AP-120B Array Processor, Edward C. Dudzinski (1982)
- Real Time Microprocessor Development System, Dale E. Nelson (1981)
- A Microprocessor Based Communication Analyzer, Leonard A. Brown (1980)
- A Microprocessor Controlled Interface to the PDP-11, Dayton R. Clark (1979)
- A PDP-11 Unibus Analyzer/Controller, Robert A. Gemin (1979)
- Microprocessor Development Laboratory Support System, Barry A. Rich (1979)
- Development of a Symbology Exerciser for Display Generation and Analysis of the Visually-Coupled Airborne System Simulator, Hollace H. Warner (1978)
- A Microprocessor Based Data Communication Monitor and Interactive Tester, Robert E. Brocklehurst (1978)
- Design of the Processor for Software Compatible Avionics Computer Family, Frederick G. Thourot (1977)
- A Microprocessor Development Laboratory Communications Interface, Melvin G. Arnold (1976)
- A Criteria for Digital Design Languages, James S. Cross (1975)

Patents:

- Apparatus for fabricating glass, Patent No. 3, 181,757, May 4, 1965

Publications:

- ACM Computer Science Conference Focus & Goals - 1988, An ACM Computer Science Conference Steering Committee/ Program Subcommittee Report, Sept. 1988 (with Larry Jehn)
- ACM Computer Science Conference - Recommendations on its Future, An ACM Computer Science Conference Steering Committee Report, Feb. 1987 (with Ray Miller and Della Bonnette)
- Conversations in Local Networks, Proceedings of the Sixteenth Annual Hawaii International Conference on Systems Sciences, Honolulu, Hawaii, Jan, 1983 (with R.D. Dixon, D.R. Clark)
- Conversations in Local Networks, Wright State University Technical Report, 1981 (with R.D. Dixon, D.R. Clark)
- A Polled Multiple Access Channel with Distributed Control, Wright State University Technical Report, 1980 (with R.D. Dixon, C. Burton, J. Weinberg)
- An X.25FLLI Implementation, Wright State University Technical Report, 1980 (with R.D. Dixon, D. Blazer, D.R. Clark)

- Adaptive Communication System Analysis and Simulation, Wright State University Technical Report, WSUCS-13, April 1979 (with R.D. Dixon)
- A System Design to Support a Visually Coupled Aircraft Simulator, (for the AF Aerospace Medical Research Laboratory) Wright State University Technical Report, WSUCS-12, June 1978 (with R.D. Dixon)
- Computer-Simulated-Target Tracking Facility, Proceedings of the 1976 USAF-ASEE Summer Faculty Research Program, Wright Patterson Air Force Base, August 1976
- Computer-Simulated-Target Tracking Facility, Wright State University Technical Report, WSUCS-5, September 1976
- Catheterization Laboratory Data Collection and Analysis System Programmers Guide, Wright State University Technical Report, WSUCS-4, April 1976 (with R.D. Dixon)
- Catheterization Laboratory Data Collection and Analysis System Operators Guide, Wright State University Technical Report, WSUCS-3, April 1976 (with R.D. Dixon)
- Reduction of Multidimensional Laplace Transform Kernels, Proceedings of the Conference on Testing and Identification of Nonlinear Systems (invited paper), California Institute of Technology, March 1975
- Simultaneous Reduction and Expansion of Multidimensional Laplace Transform Kernels, SIAM Journal on Applied Mathematics, June 1974, (with J. Heinen)
- Integral Square Optimization of Class of Nonlinear Systems, Proceedings of the Fifth Asilomar Conference on Circuits and Systems, Pacific Grove, California, November 8-10, 1971
- Multidimensional Laplace Transform Analysis of Nonlinear Systems, Ph.D. Dissertation, Marquette University, April 1971
- Second Order N-Dimensional Systems and the Liapunov Matrix Equation, IEEE Transactions on Automatic Control, February 1971, (with J. Heinen)
- A Study of Computer Analysis and Decision Making Requirements for Marquette University, Marquette University Internal Publication, October 1970 (with J. Heinen and E. Foudriat)
- Stability Analysis of Multidimensional Laplace Transform Kernels, Proceedings of the Thirteenth Midwest Symposium on Circuit Theory, University of Minnesota, May 7-8, 1970
- Convergence of the Quantizing Method for System Identification, IEEE Transactions on Automatic Control, 1968, (with S. Wu)

Professional and Honorary Society Affiliations:

- ACM (Served on National Committees)
- IEEE Computer Society (Served on National Committees)
- IEEE
- National Society of Professional Engineers
- Ohio Society of Professional Engineers
- Sigma Xi (Honorary Science Society)
- Eta Kappa Nu (Honorary Electrical Engineering Society)
- Tau Beta Pi (Honorary Engineering Society)