
CURRICULUM VITAE

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Academic Degrees

- 1973-1979 Ph.D. in Architecture, Department of Architecture, Carnegie Mellon University.
Dissertation title: *Models of Architectural Knowledge: An Information Processing View of Design*
- 1970-1973 Master of Architecture in Environmental Systems; School of Architecture, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Masters Thesis: *Contextual Fittingness of Everyday Activity Encounters*
- 1968-1970 Master of Architecture, Faculty of Architecture, Middle East Technical University, Ankara, Turkey. Masters thesis: *A Theoretical Basis for Campus Design: A Case Study in Adana*
- 1964-1968 Bachelor of Architecture, Faculty of Architecture, Middle East Technical University, Ankara, Turkey.

Positions

Ranks

- 1987 Professor, Department of Architecture, Carnegie Mellon University.
1985 Indefinite tenure, Department of Architecture, Carnegie Mellon University.
1981 Associate Professor, Department of Architecture, Carnegie Mellon University.
1978 Assistant Professor, Department of Architecture, Carnegie Mellon University.
1977 Instructor, Department of Architecture, Carnegie Mellon University.

Administrative Positions

- 2004-on Coordinator of the CAD Master of Science and PhD programs
2001-on Co-director (with Professor Susan Finger, Civil and Environmental Engineering) of the Master of Science Degree in *Architecture, Engineering Construction Management* jointly offered between the School of Architecture and the Department of Civil and Environmental Engineering.
1986-2000 Chair, Graduate Studies, School of Architecture, Carnegie Mellon University
1986-1988 Board of Directors, Carnegie Mellon University Art Galleries.
1983-1988 Steering Committee, Center for Art & Technology, Carnegie Mellon University.
1981-1987 Head, Department of Architecture, Carnegie Mellon University.
1979-1981 Director, Laboratory for Design and Information Processing, Institute of Building Sciences, Carnegie Mellon University.
1972-1973 Acting Director, Physical Plant Planning, Virginia Polytechnic Institute and State University, Blacksburg, VA.

Conference Chairmanships

- 2004 Chair of the *Generative-CAD Symposium* held at Carnegie Mellon University (July).
Chair of Session on e-Work and e-Business: Construction Collaboration and Management (October 7) at the ECPPM-04, European Conference on Product and Process modeling in the Building and Construction Industry, Istanbul, Turkey.

- 2002 Chair of the *Symposium on Culture Art and Architecture in Ottoman Turkey*, held at University of Pittsburgh and Carnegie Mellon University (September).
- 1996 Co-chair of *Descriptive Models of Design*, 4th International Symposium on Design Thinking, jointly sponsored by Istanbul Technical University and Carnegie Mellon University, Istanbul Turkey (July).
- 1979 Co-chair of ACSA.79: North East Regional Meeting of the Association of the Collegiate Schools of Architecture; Carnegie Mellon University, Pittsburgh, PA, (March).
- 1972 Assistant Chairman of the IV *Environmental Design and Research Association (EDRA) Conference*, School of Architecture, Virginia Polytechnic Institute and State University, Blacksburg, VA (April).

Fellowships

- 2005-on Center for Sensed Critical Infrastructure Research (CenSCIR), ICES, Carnegie Mellon University
- 1998-on Institute of Complex Engineered Systems (ICES), Carnegie Mellon University
- 1996-1999 Center for Innovation in Learning (CIL), Carnegie Mellon University.
- 1992-1997 Engineering Design Research Center (EDRC), Carnegie Mellon University
- 1989-2002 Studio for Creative Inquiry, Carnegie Mellon University.
- 1980-1988 Design Research Center (DRC), Carnegie Mellon University.

Academic Committees

- 2006 Chair of the Admissions Committee, School of Architecture
Member of the Graduate Fellowship Fundraising Committee, School of Architecture
- 2005 Chair of the SRC (School Review Committee)
SID (Summer internship for Diversity) in the School of Architecture Planning: fundraising and instruction (June-July).
- 2004 Chaired the Design Computing committee responsible for policy and curricular, strategic plan, admissions, and other academic issues pertaining to the MSc and PhD programs of the School of Architecture (2004-5)
Member, Head selection committee, School of Architecture.
SID (Summer internship for Diversity) in the School of Architecture Planning: fundraising and instruction (June-July).
- 2003 Member of the Diversity Council of Carnegie Mellon University.
SID (Summer internship for Diversity) in the School of Architecture Planning: fundraising and instruction (June-July).
- 2002 Chair of the Berkman Faculty Development Fund (member since 2000)
Advisory board of the Intercultural Communication Center, Carnegie Mellon University.
Software Engineering Professional Programs Committee, School of Computer Science, Carnegie Mellon University.
SID (Summer internship for Diversity) in the School of Architecture Planning: fundraising and instruction (June-July).
- 2001 Co-Chair, University Education Council, Carnegie Mellon University.
Executive Committee of the Faculty Senate, Carnegie Mellon University.
SID (Summer internship for Diversity) in the School of Architecture Planning: fundraising and instruction (June-July).
- 2000 Faculty Diversity Sub-committee, Strategic Planning Committee, Carnegie Mellon University
Chair, Curriculum Committee, School of Architecture, Carnegie Mellon University.
SID (Summer internship for Diversity) in the School of Architecture Planning: fundraising and instruction (June-July).
- 1999 Chair, Educational resources sub-committee of Internal Affairs committee of the School of Architecture, Carnegie Mellon University.
SID (Summer internship for Diversity) in the School of Architecture Planning: fundraising and instruction (June-July).
Co-chair, School Head review committee, Carnegie Mellon University.
- 1998 Chair, Study Abroad Committee, School of Architecture, Carnegie Mellon University.

- SID (Summer internship for Diversity) in the School of Architecture Planning: fundraising and instruction (June-July).
- 1994 Coordinator, 4th year, Fall design studio: "Architectural Design and Occupancy"
Head Search Committee, Department of Architecture, Carnegie Mellon University.
Chair, Dean's *Ad Hoc* Committee on Appointment, Re-appointment, Promotion and Tenure procedures, College of Fine Arts, Carnegie Mellon University.
Facilities Design and Construction Quality Team, Carnegie Mellon University.
- 1993 Undergraduate curriculum committee, Department of Architecture, Carnegie Mellon University.
University tenure review committee, Carnegie Mellon University.
- 1992 Graduate Student Award Jury, Carnegie Mellon University (also in 1997 - 1999).
Chair, Departmental Electives Committee, Department of Architecture, Carnegie Mellon University.
Science and Technology Committee, Department of Architecture, Carnegie Mellon University.
University Education Council, Carnegie Mellon University (through 1993).
- 1991 University Research Council, Carnegie Mellon University.
- 1990 Co-chair, Appointment, Re-appointment, Promotion and Tenure Sub-Committee on Professional Practice, College of Fine Arts, Carnegie Mellon University.
Grades meeting and academic action policy task group, Department of Architecture.
Design Review Committee, Carnegie Mellon University (through 1995).
- 1989 Faculty Affairs Council, Faculty Senate, Carnegie Mellon University.
Family and the Work Place Task Force, Carnegie Mellon University.
Appointment, Re-appointment, Promotion and Tenure Committee of the Faculty Senate, Carnegie Mellon University.
University Center Committee, Board of Trustees, Carnegie Mellon University.
Master of Architecture degree, task force, Department of Architecture, Carnegie Mellon University.
Departmental Council, Department of Architecture, Carnegie Mellon University.
NAAB, task force, Department of Architecture, Carnegie Mellon University.
- 1988 Chair, MS/PhD Committee, Department of Architecture, Carnegie Mellon University
Educational Computing Committee, Department of Architecture, Carnegie Mellon University.
Committee on Alcohol and Drug Education, Carnegie Mellon University.
Faculty Senate, Carnegie Mellon University.
- 1987 Software Engineering Program Curriculum Development, School of Computer Science, Carnegie Mellon University.
- 1985 Departmental Review Committee, Department of Architecture (through present).
- 1984 Campus Planning Committee, Carnegie Mellon University.
- 1983 Educational Computing Committee, Department of Architecture, Carnegie Mellon University.
Space Allocation Sub-committee of the Space Allocation Board, Carnegie Mellon University.
- 1982 R.K. Mellon Doctoral Fellowship Selection Committee, Carnegie Mellon University.
- 1981 Chair, Design Sequence, Department of Architecture, Carnegie Mellon University.
University Research Council, Carnegie Mellon University (through 1986).
Building and Grounds Sub-committee of the Board of Trustees, Carnegie Mellon University (through 1986).
- 1981 Minority Graduate Student Recruitment Committee, Carnegie Mellon University.
- 1980 Search Committee for Computing Center Director, Carnegie Mellon University.
Chair, Master of Architecture Program, Department of Architecture, Carnegie Mellon University.
Ph.D. Committee, Department of Architecture, Carnegie Mellon University. (through 1982).
- 1979 Level-three coordinator, Design Sequence, Department of Architecture, Carnegie Mellon University.

- Graduate Programs Committee, Department of Architecture, Carnegie Mellon University.
 1978 Appointment Re-appointment and Tenure Document Committee, Department of Architecture, Carnegie Mellon University.

Curriculum Planning

- 2004-5 Design Computing curriculum of the School of Architecture
 2001 Master of Science in *Architecture, Engineering and Construction Management*, jointly offered with the Department of Civil and Environmental Engineering, Carnegie Mellon University
 2000 Plan for *peer-to-peer* computing in the School of Architecture funded by the Office of Technology and Education, Carnegie Mellon University
 1999 Revision of the graduate curriculum, through the MSc-PhD committee of the School of Architecture, Carnegie Mellon University.
 1997 Revision of the graduate curriculum, through the MSc-PhD committee of the School of Architecture, Carnegie Mellon University.
 1996 Revision of the graduate curriculum, through the MSc-PhD committee of the Department of Architecture, Carnegie Mellon University.
 1993 Revision of the undergraduate curriculum, through the Electives and the Curriculum committees of the Department of Architecture, Carnegie Mellon University.
 Revision of the existing Master of Science program and the development of a new Master of Science program.
 1990 Revision of the existing Master of Science program and the development of a new Master of Science program, Department of Architecture, Carnegie Mellon University.
 1987 Revision of the Master of Architecture curriculum as Head, Department of Architecture, Carnegie Mellon University.
 1986 Revision of the Bachelor of Architecture curriculum as Head, Department of Architecture, Carnegie Mellon University.
 1981 Development of the new Bachelor of Architecture curriculum as Head, Department of Architecture, Carnegie Mellon University.
 Chairman and principal designer of the Design-Build component of the Master of Architecture Program, Department of Architecture, Carnegie Mellon University.
 1980 Development of the new Master of Architecture curriculum as Chairman of the M. Arch. Program, Department of Architecture, Carnegie Mellon University.

Professional Appointments and Affiliations

- 2003 Founding member of METU, Faculty of Architecture, Alumni Research and Industry collaboration organization
 2001-2002 Founding member of PROGE, an innovative consulting firm in the building sector using advanced technologies in facilities management, construction management and development
 Member of the MSA/MSIA program faculty, School of Computer Science
 2000-2002 Chairman of the Turkish Nationality Room Committee, established to create and install the Turkish room among the Nationality Rooms of the University of Pittsburgh.
 Member of Central Eurasian Studies Society, Boston, USA
 1988-1992 President, Architectural Design Associates, Inc., a Pennsylvania based architectural design firm.
 1988-1990 Arbitrator, American Arbitration Association.
 1987 Juror, University Center Project National Competition Jury with Thomas Beebe, Graham Gund and Robert Cambell, Carnegie Mellon University, Pittsburgh, PA.
 1983 Long Range Planning Committee, AIA Pittsburgh Chapter.
 1982-1987 Delegate from Pittsburgh, AIA National Convention.
 1982-1987 Board of Directors, AIA Pittsburgh Chapter.
 1982-1985 Grader, National Council of Architectural Registration Boards, Washington, DC; Design Examination.
 1982 -1987 Chair, Liaison Committee, AIA Pittsburgh Chapter.
 1981-1987 Member, AIA Pittsburgh Chapter.

- 1979-1980 Founder, principal designer and architectural consultant, AL-MISHKAH, Riyadh, Saudi Arabia and Pittsburgh, Pennsylvania, an architectural firm.
- 1977 Registered Architect (EX-7881), Commonwealth of Pennsylvania.
- 1971-1973 Office of Physical Plant Planning, Virginia Polytechnic Institute and State University, Blacksburg, VA; (acting director during 1973).
- 1969-1970 Office of the Campus Planner, University of Ankara, Turkey.
- 1968 Turkish Chamber of Architects, Ankara (in perpetuity)
- 1967 Intern, Office of Professor Gehrdt Bornebusch, Copenhagen, Denmark.
- 1965 Intern, Office of Professor Ahmet Gulgonen, Ankara, Turkey.

Other Assignments and Responsibilities

- 2003 Invitation to develop and teach in two Master of Science, at the Middle East Technical University, Ankara, Turkey: one dealing with advanced computer applications in the building sector, and the other with design-construction-facilities management. Instrumental in inviting several academicians from USA, Australia and Europe to participate in these programs.
- 2001- 2004 Developed and taught in the Masters Design and Media program, at the Istanbul Technical University, Istanbul, Turkey. Instrumental in inviting several academicians from USA, Australia and Europe to participate in these programs.
- 1996 Invitation to be a part of the Engineering and Construction for Sustainable Development in the 21st Century, An International Research Symposium and Technology Showcase, Washington, D.C., 4-8 February
- 1995 - 1997 Appointment to an Advisory Board in EDUTECH, Georgia Tech
- 1995 Invitation to participate in the NSF sponsored Strategic Planning Workshop for Design Engineering, Gold Canyon, Phoenix, Arizona; May 22-24.
- 1994- 1995 Long Range Planning Committee, Oakland Catholic High School.
- 1990- 2002 Organizer of colloquia for Ph.D. Students, School of Architecture, Carnegie Mellon University.
- Ongoing *Reviewer and technical board member of several conference series among others:*
 EIA9: E-Activities and Intelligent Support in Design and the Built Environment
 Design Computing and Cognition
 CAD Futures
 Communication and Control Technologies: CCCT
 International Joint Conference on Artificial Intelligence. IJCAI
 Artificial Intelligence in Design
 Design Thinking Research Conference series
 International Conference on Design Creativity
 Association of Computer Aided Design Instruction in Architecture: ACADIA

Research

Proposals

- 2006 "Workshop for the Investigation, Documentation, and Dissemination of National Science Foundation Research Validation Testbeds at the National Institute of Standards and Technology" Submitted to: Chema De La Garza, National Science Foundation. Proposed by Ömer Akın, and James H. Garrett, Jr. (amount funded: \$55,000).
- 2005 "An Integrated Approach for Interpreting and Fusing Building and Mobile Sensor Streams in a Facility into High-Level Information" Submitted to: Kent Reed, National Institute for Standards and Technology. Proposed by Ömer Akın, Burcu Akıncı, and James H. Garrett, Jr. (amount funded: \$350,000).
- 2004 "Embedded Commissioning for Improved Building Operations and Maintenance: Case Studies, Data Models and Exchange for Interoperability," Proposed by Ömer Akın, Burcu Akıncı, and James H. Garrett, Jr. on May 31, 2004 (amount requested for 2003-4: \$200,000).

- 2003 “The Development and Use of an Automated Test Rig for Assessing the Effectiveness of the IFC Related 2X Data Exchange Standard for Exchange of Building Commissioning” awarded by the National Institute for Standards and Technology to Ömer Akın, Burcu Akıncı, and James H. Garrett, Jr. on May 28, 2003 (amount funded for 2003-4: \$199,803).
- “SENSORS: *In Situ* Real-Time Moisture Monitoring of Roofing Systems using Distributed Nanosensors” Proposal submitted to National Science Foundation, the new initiative on “sensor research” of the CISE Directorate, joint with Professor Metin Sitti and James Garrett (request, not funded: \$ 495,603).
- “*In Situ* Real-Time Moisture Monitoring of Roofing Systems using Distributed Nanosensors” Seed funding request from PITA (Pittsburgh Industry Technology Association) for \$14,300, for one year.
- 2002 “CAVECAD, an immersive-interactive design environment” Proposal submitted to CMU internal sources. (Funded for one year \$8,900)
- “Determining the Requirements on Product and Process Models that Support Building Commissioning” Submitted to the National Institute for Standards and Technology by Ömer Akın, Burcu Akıncı, and James H. Garrett, Jr. on April 25, 2002 (amount funded for 2002: \$219,892)
- 2001 “Case Based Decision Making for Complex Engineered Systems” Proposal submitted jointly with John Wesner, to the Directorate of Engineering at the National Science Foundation (three years, \$400,000).
- “Industry Usable Shape Grammar Interpreter” Proposal submitted jointly with Jonathan Cagan, to the Directorate of Engineering at the National Science Foundation (three years, \$600,000).
- “A Case-Based Decision Assistance Tool (C-DAT) for the Construction Industry” Proposal submitted jointly with Robert Ries, to the Construction Industry Institute (two years, \$208,000).
- “arc.cite.net” A proposal submitted by the Curriculum Committee to the Office of Technology and Education, Carnegie Mellon University, in order to encourage peep-to-peer computing in the School of Architecture. Requested \$100,000. 2001-02 funding: \$10,000.
- “Virtual Culture” proposal made to the Studio for Creative Inquiry.
- 1999 “Cognitive System Engineering in Architectural and Industrial Product Design” A proposal submitted to CISE Directorate of National Science Foundation by Akın, and Garrett. (Multi-year, >\$600,000).
- 1998 “Design Requirements support environment: SEED-Pro+” a proposal to National Science Foundation. Requested amount \$712,003. Duration: three years.
- “Computational Methods for Modeling Processes and Artifacts in Product Design” a proposal to National Science Foundation. Work to be undertaken jointly by Vesna Popovic of Queensland University of Technology, Australia; and Steven Harrison of Xerox Park, Palo Alto, California. Request: \$578,540. Duration: three years.
- “STC: Pittsburgh Center for Science and Technology” a proposal to National Science Foundation. Participant in proposal submitted by Dwight M Baumann of Mechanical Engineering Department, Carnegie Mellon University. Requested amount \$20,000,000.
- “Simulation-based reasoning in collaborative engineering design education” a proposal to National Science Foundation. Participant in proposal submitted by Ardeshir Mahdavi of the School of Architecture, Carnegie Mellon University. Requested amount \$484,122. Duration: three years.
- 1997 “Enhancing technological education: decision making and ethics across the curriculum in a technological society” a proposal to National Science Foundation. Participant in proposal submitted by Indira Nair of Engineering and Public Policy Department, Carnegie Mellon University. Requested amount \$200,000. Duration: three years.

(Co-)Principal Investigator

- 2006 "Workshop for the Investigation, Documentation, and Dissemination of National Science Foundation Research Validation Testbeds at the National Institute of Standards and Technology" Submitted to: Chema De La Garza, National Science Foundation. Co-investigated by Ömer Akin, and James H. Garrett, Jr. Amount funded: \$55,000.
- 2005 "An Integrated Approach for Interpreting and Fusing Building and Mobile Sensor Streams in a Facility into High-Level Information" Submitted to: Kent Reed, National Institute for Standards and Technology (Co-investigated by Ömer Akin, Burcu Akinci, and James H. Garrett, Jr.) Amount funded: \$350,000.
- 2004 "Embedded Commissioning for Improved Building Operations and Maintenance: Case Studies, Data Models and Exchange for Interoperability" NIST Grant # 70NANB4D1099 Project Director: Steven Bushby, National Institute for Standards and Technology (Co-investigating with Burcu Akinci, and James H. Garrett, Jr.) Amount funded: \$200,000 To be completed in May 2006.
- "In Situ Real-Time Moisture Monitoring of Roofing Systems using Distributed Nanosensors" PITA Grant administered by the Institute for Complex Engineered Systems, Carnegie Mellon University (Co-investigating with James H. Garrett, Jr., and Metin Sitti) Amount funded: \$41,551.
- "The Development and Use of an Automated Test Rig for Assessing the Effectiveness of the IFC2X Data Exchange Standard for Exchange of Building Commissioning Data" NIST Grant # 60NANB3D1114 Project Director: Kent Reed, National Institute for Standards and Technology (Co-investigating with Burcu Akinci, and James H. Garrett, Jr.) Amount funded: \$199,803.
- 2003 "Determining the Requirements on Product and Process Models that Support Building Commissioning" Continuing support by the National Institute for Standards and Technology. Amount funded for 2003: \$219,892. Completed in 2005.
- 2002 "Determining the Requirements on Product and Process Models that Support Building Commissioning" Supported by the National Institute for Standards and Technology. Amount funded for 2002: \$219,892. Completed in 2004.
- 2001 "arc.cite.net" A proposal to encourage peep-to-peer computing in the School of Architecture. 2001-02. Amount funded for 2001: \$10,000. Assigned to R Krishnamurti for completion.
- 1997 *Ethical Decision Making*. Enhancing technological education: decision making and ethics across the curriculum in a technological society. Funded Mr. Steinbrener, alumnus of Carnegie Institute of Technology. Served as an investigator in the research project directing one of the course modules to implement ethics instruction. Grant amount \$200,000. Duration: three years. Completed in 1999.
- 1994 *SEED-Pro*: architectural programming module of the SEED (Software Engineering in the Early Stages of Building Engineering) project (1993-1999) Director of the SEED-Pro project housed initially at the EDRC (Engineering Design Research Center) and subsequently in ICES (Institute for Complex Engineered Systems). Co-researchers are Ulrich Flemming, Robert Woodbury, Steve Fenves and James Garrett (faculty), Ran Sen, Magd Donia, Michael Cumming, Hoda Moustapha and Ye Zhang (Ph.D. students). Funding is provided by CERL. Total grant allocated to project \$240,000 which is equivalent to about \$50,000 per year. Principal sponsor: CERL. Completed in 2000
- 1995 *EDAT - The electronic design assistance tool*. Courseware grant for advancing design learning through innovations in computer assisted instruction. A multi-year, multi-disciplinary research program for strategic development of "electronic teaching assistants" to assist in design instruction. Intellectual support and seed funding is being provided by the Provost and Associate Provost for Education. The goal is to pursue the development of a prototype system for use in 48-405 (see courses taught). Total grant amount: \$9,000. Completed in 1996.
- 1992 *Rationality and Problem Structuring in Design*; Co-Principal Investigator: Professor John Hooker) multi-year funding by the National Science Foundation. First year: \$69,770;

- second year: \$71,973; third year: \$74,194; total of \$215,937. Purpose: Develop a model for spatial layout generation that utilizes both optimization and heuristic strategies. Interim results: A computer program: HeGeL-II; and several papers for refereed journals and conferences. Completed in 1995.
- 1992 *Fellow of the Studio for Creative Inquiry*: Completed one project that was published. A second project has been launched and has resulted in a published paper and a major NSF grant request. Support: conference attendance fees by the University of Delft. Until 2002.
- 1991 *Carnegie Mellon University-ASG Facilities Management System Development* (Project Manager and Co-Principal Investigator) Purpose: Development of computational facilities management prototypes demonstrating the principles of seamless processes and shared data in the design delivery process. Results: Ongoing work on prototype development; several working papers distributed to sponsors, Carnegie Mellon University officials and members of CBCC. Completed 1992.
- 1989 *Design Management and the Collective Design Process* (Co-Principal Investigator, Professor Nur Esin) funding through the Scholar Exchange program of the National Science Foundation for Carnegie Mellon University and the Istanbul Technical University (\$19,900). Purpose: Modeling the collective design process and the “negotiation” of design in the architects’ office. Results: International workshop on design management in Istanbul, June 1990. Several publications and reports. Completed 1992.
- 1986 *Rapid Prototyping*: Seed funding from Robotics Institute, Carnegie Mellon University, Pittsburgh, PA (\$5,000). Purpose: To conduct literature search, background research and to develop Strategies for automated building design and construction research. Results: Several papers, research proposals to NSF, NEA, HUD and CSC-PRC and conference presentations. Completed 1988.
- 1984 *Structuring Architectural Design Problems*. Funded by National Science Foundation, grant no. CEE-84-11632. (\$130,737). Purpose: Model designers' *problem solving* and *problem structuring* behaviors as measured during visual problem solving tasks in the laboratory setting. Develop an information processing model of these processes and simulate design behavior on the computer. Evaluate the function of these two models in solving simple architectural layout problems. Results: A computer simulation program for design decision-making called HeGeL, several refereed publications, conference presentations and a manuscript for a monograph, in the process of development. Completed 1988.
- 1982 *Knowledge Acquisition and Knowledge Engineering*; Co-Principal Investigator Raj Reddy) Funded by the National Science Foundation, grant no. MCSS 82-05539. (\$153,809). Purpose: Develop techniques for knowledge acquisition using protocol analysis to understand and improve user-machine interaction. Results: Several papers published in refereed journals and presented at national conferences and workshops. Completed 1986.
- 1978 *Knowledge Acquisition*: Funded by National Science Foundation, grant no. MCS-78-25824. (\$31,596). Purpose: Conduct background research and develop proposal for grant under the above item. Results: Background research for publications, proposal and subsequent funding. Completed 1982.

Research Consulting and Reviewership

- 2003 Two Master of Science program development at the Middle East Technical University, Ankara, Turkey: one dealing with advanced computer applications in the building sector, and the other with design-construction-facilities management.
- 2001-3 Istanbul Technical University, CAD development project supported by the office of the Rector.
- 2001-2 Founding member of *InnoCent*, a technological think-tank to innovate in the building sector using advanced technologies, and arm of *PROGE*

- 1996 Istanbul Technical University, CAD development project supported by Turkish Scientific Research Center (Türk Bilimsel ve Teknolojik Araştırma Kurumu; 1984 Summer) and TOKTEN program of the United Nations.
- 1993 Research consultant to the Educational Testing Service, Princeton, NJ; on the evaluation of an automated testing system for the NCARB licensing examination. Until 1997.
- 1991 National Science Foundation, Building Systems Design panel member.
- 1986 National Endowment for the Arts, Washington, DC, Design Research; review panelist. Until 1989.
- 1985 National Science Foundation research proposal reviewer: including Information Sciences Design Manufacturing and Computer-Aided Engineering Divisions, NSF, Washington, D.C. Until 1995.
- 1984 Turkish Scientific Research Center funded by United Nations; served as consultant for computer-aided design and self-help housing research, upon invitation of the TOKTEN Program of the United Nations.
- 1983 Ben Franklin Foundation for industrial, entrepreneurial research and development; reviewer. Until 1985.
- 1978 ASMER Information Access Systems Reactor Panel Consultant (1978-1979): funded by the Department of Mental Health, Washington, D.C.
- 1976 Specifications for a computer aided design management system (1976): funded by the Army Corps of Engineers; research done in the Institute of Physical Planning, Carnegie Mellon University, Pittsburgh PA.
Automated image understanding systems (1976-1978): funded by the Computer Science Department, in contract with Advanced Research Projects Agency (ARPA), Carnegie Mellon University, Pittsburgh, PA.
- 1974 Computer aided design systems (1974-1976): partially funded by the National Science Foundation; work done in the Department of Architecture, Carnegie Mellon University, Pittsburgh, PA.
- 1973 Crime prevention through environmental design (1973-1974): funded by Westinghouse Corporation in contract with the Law Enforcement Assistance Agency; work done at Carnegie Mellon University, Pittsburgh, PA.
- 1971 Fallout shelter allocation, Roanoke, Virginia (1971-1972): funded by the Department of Defense; work done at the College of Architecture and Planning, Virginia Polytechnic Institute and State University, Blacksburg, VA.

Publications

Books

- 2005 Manuscript: *Ethical Decision Making: Theory and Case Studies for the Building Industry. A Cartesian Approach to Design Rationality* The METU Press, Ankara, Turkey; accepted for publication; in print.
- 2004 *Generative CAD Systems* School of Architecture, Carnegie Mellon University, Pittsburgh, PA; co-authored with Ramesh Krishnamurti and Khee Poh Lam.
- 1986 *Psychology of Architectural Design*, London: Pion, Ltd., 1986 (paperback edition: 1989).
- 1982 *Representation and Architecture* (with E. Weinel) Maryland: Information Dynamics, Inc.

Encyclopedia Entries

- 1995 "Uygur vernacular architecture", "Bai vernacular architecture", "Yi vernacular architecture", "Naxi vernacular architecture" all four in the *Encyclopedia of Vernacular Architecture of the World* edited by Paul Oliver, first edition.

Book Chapters

- 2004 "Why Is Formal Notation Helpful In Design-Cognition Research?" (with Hoda Moustapha) in *Design Cognition and Computation*, editor Andrew Dong (in review)

- 2002 "Future Of The Campus: Campus Of The Future" In *Future Of The University*, University Of The Future Edited By Daniel Resnick, Carnegie Mellon University Press.
"Variants in Design Cognition" in *Knowing and Learning to Design* edited by C. Eastman, M McCracken, and W. Newstetter, Elsevier, 2001, pp. 105-124.
- 1996 "Design protocol data and novel design decisions" (with C. T. Lin) in *Analysing Design Activity*, edited by N. Cross and K. Dorst, John Wiley and Sons, Chichester, West Sussex, 1996, pp. 35-64.
- 1994 "Formal representation of meaning in architecture" in *Formal Design Methods for CAD* ed. by J. S. Gero and E. Tyugu, Elsevier Science B. V., North Holland, 1994.
- 1988 "Expertise of the architect" in *Expert Systems for Engineering Design*, ed. by M. Rychener, New York: Academic Press, 1988, pp. 173-196.
- 1986 "Introducing advanced technologies: human implications," (with R. Nath and R. Reddy) in *Human Development*, ed. by K. Haq and U. Kirdar, North-South Roundtable, Islamabad, Pakistan, 1986, pp. 281-298.
- 1985 "A comprehensive computing system for architectural education," (with U. Flemming and R. Woodbury) in *Computers in Education* ed. by K. Duncan and D. Harris, North-Holland, Elsevier Science Publishing, 1985.
- 1984 "An exploration of the design process," in *Developments in Design Methodology*, ed. by N. Cross, New York: Wiley, 1984, pp. 189-208.
"Methods for research and practice in architecture," in *Doctoral Education for Architectural Research*, ed. by G. T. Moore and J. A. Temple, New York: ARCC Press, 1984, pp. 59-70.
- 1983 "Role models in architectural education," in *The Role of the Architect in Society*, ed. by P. Burgess, Pittsburgh: Carnegie Mellon University, Department of Architecture, 1983, pp. 9-13.
- 1982 "Subitizing," (with William Chase) in *Handbook of Learning and Cognition Processes*, vol. 6 ed. by W. K. Estes, New York: Halsted Press Inc., 1982.
"Representation and architecture," in *Representation and Architecture*, ed. by Ö. Akin and E. Weinel, Maryland: Information Dynamics, 1982, pp. 1-26.

Refereed and Invited Publications

- 2006 "Role of Requirements in Design Education n the Studio" in *International Journal of Technology and Design Education* with Halime Demirkan (in review)
"The Whittled Design Space" in *Artificial Intelligence for Engineering Design, Analysis and Manufacturing* (in print)
- 2005 "Why is formal notation helpful in design-cognition and computation research?" in *Design Studies*, with Hoda Moustapha (in print)
"Requirement-driven design: assistance for information traceability in design computing" in *Design Studies*, with İpek Özkaya (in print)
"Computational Support for Building Evaluation: Embedded Commissioning Model" in *Journal of Automation in Construction* with Tanyel Türkaslan-Bulbul (in print)
"Use of requirement traceability in collaborative design" in *CoDesign*, with İpek Özkaya (in print)
- 2004 "Three Fundamental Tenets for Architectural Ethics" invited paper for the *ACSA Teacher's Conference*, Cranbrook Academy of Art, MI, July 8-11
"The impact of requirement traceability in collaborative design environments," (with İpek Özkaya) in the *Journal of Co-Design*
"extreme Design," *ARCHI*, November 2004, pp. 12-20.
- 2003 "Strategic Use of Representation in Architectural Massing," (with Hoda Moustapha) *DS* 25, 1, 31-5
- 2002 "CAD@CMU.EDU" Invited paper in the Proceedings of the *CAD Futures Conference*
"Case based instruction strategies in architecture" *Design Studies*, 23, 4, 407-432.
"Strategic use of representation in architectural massing" *Design Studies*, in press
- 2001 "Simon says: design!" *Arredamento*, July.
"Crossbreeding the Real, the Artificial and the Virtual" in *XXI*, March.
"Herbert Simon: A tribute to the youthful days of CMU" in *Focus*, March

- 1999 "Fascist Architecture of Carnegie Mellon University" *Focus*, the faculty newspaper of Carnegie Mellon University, Vol. 29, No.1, October, invited article
 "The Henry Hornbostel MO: a story of serendipity on a yellow brick road" unsolicited contribution to *Focus*, the faculty newspaper of Carnegie Mellon University, 30, No.1, November
- 1998 "On the process of creativity in puzzles, inventions and designs" (with Cem Akin) in *Automation in Construction*, 7 (1998) 123-138
 "Editorial" (Special issue: models of design) *Automation in Construction*, 7 (1998).
- 1997 "An electronic design assistance tool for case-based representation of designs" (with M Cumming, M Shealey, B Tuncer) in *Automation in Construction*, 6 (1997) 265-274
 "Editorial" (Special issue: descriptive models of design) *Design Studies* 18 (1997) 323-328.
 The computer as a catalyst for new educational paradigms in architecture" in *Mimarlik, the Journal of the Faculty of Architecture*, Middle East Technical University, Ankara Turkey, Spring 1997
- 1996 "Navigation within a structured search space in layout problems" (with Rana Sen) *Environment and Planning B: Planning and Design*, 23 (1996) 421-442
 "Frames of reference in architectural design: analysing the hyper-acclamation (A-h-a!) (with Cem Akin) *Design Studies*, 17 (1996) 341-361.
 "Quality of architectural service in the project management process" in *Journal of Architectural and Planning Research* 13, 1 (1996) 63-90
- 1995 "Design protocol data and novel design decisions" (with C. T. Lin) *Design Studies*, 16 (1995) 211-236.
 "SEED-Pro: Computer assisted architectural programming in SEED" (with Rana Sen, Magd Donia, Ye Zhang) *Journal of Architectural Engineering*, 1, 4 (1995) 153-161.
- 1994 "Creativity in design" *Performance Improvement Quarterly* 7, 3 (1994) 9-21
 "Determining the impact of CADrafting on the building process" (with Z. Anadol) in *International Journal of Construction Information Technology*, Spring (1994) 1-8
- 1993 "Architects' reasoning with structures and functions" *Environment and Planning B: Planning and Design* 20 (1993) 273-294
- 1992 "Heuristic generation of layouts (HeGeL) based on a paradigm for problem structuring," (with B. Dave and S. Pithavadian) *Environment and Planning B: Planning and Design* 19 (1992) 33-59.
- 1990 "Necessary conditions for design expertise and creativity," *Design Studies*, 11, 2 (1990) 107- 113
- 1987 "Structure of a directory space: a case study with a UNIX operating system," (with C. Baykan and D. R. Rao) *International Journal of Man-Machine Studies*, (1985) 22, 587-611.
- 1986 "A formalism for problem structuring and resolution," *Environment and Planning B: Planning and Design*, 13 (1986) 223-232
- 1985 "Tasarım ve bina üretiminde bilgisayarın rolü" (The role of computers in design and building delivery) *Mimarlik*, September 1985, pp. 22-28
 "Efficient computer-user interface in electronic mail systems," (with D. R. Rao) *International Journal of Man-Machine Studies*, 22 (1985) 589-611
- 1979 "A style named Post-Modern" *Architectural Design*, 49, 8-9 (1979) 224-226
 "Exploration of the design process," *Design Methods and Theories*, 13, 3/4 (1979) 115-119
- 1978 "Book review: *Architecture of Form*, ed. by Lionel March," in *Environment and Planning B*, (1978) 237-239.
 "Quantification of 3-dimensional structures," (with W. G. Chase) *Journal of Experimental Psychology*, 4, 3 (1978) 397-410
- 1977 "Knowledge acquisition for image understanding research," (with R. Reddy) *Computer Graphics and Image Processing*, 6 (1977) 307-334

Conference Publications

- 2005 "Mixing One's Domains: Architecture Plus Software Engineering" in *Proceedings of*

- eCAADe 2005, Lisbon, Portugal, September 21-24, with İpek Özkaya
- “Computational Support for Building Evaluation: Embedded Commissioning Model” in *Proceedings of the Future of the AEC Industry Conference* sponsored by the Building Futures Conference, Las Vegas, March, with Tanyel Türkaslan-Bulbul
- “Teaching to think in software terms: an interdisciplinary graduate software requirement engineering course for AEC students” in *Proceedings of International Conference on Computing in Civil Engineering*, Cancun, Mexico, July 11-15, with İpek Özkaya and James Tomayko
- “A review of building product models in AEC industry towards a model for building commissioning” in *Proceedings of the 3rd International Conference on Innovation in AEC*, Rotterdam, The Netherlands, with Tanyel Türkaslan-Bulbul
- “The virtual-augmented-reality environment for building commission: case study,” *Proceedings of ICEBO 2005 Conference*, Pittsburgh, PA, USA, October 15-17 with Sanghoon Lee
- ”Linking Building Commissioning and Operations and Maintenance towards an Embedded Commissioning Practice,” in *Proceedings of ICEBO 2005 Conference*, Pittsburgh, PA, USA, October 15-17, with İpek Gürsel
- 2004 “Fundamental Tenets for Architectural Ethics” *ACSA Teacher’s Conference*, Cranbrook, MI
- “CAD@CMU” in *Proceedings of the GCADS-04 International Symposium*, Carnegie Mellon University, School of Architecture, Pittsburgh, PA, USA, July 12-14, 2004.
- “Emerging CAD Processes: The Case of Computer Aided Requirement Management” in *Proceedings of the GCADS-04 International Symposium*, Pittsburgh, PA, USA, July 12-14, with Pike Özkaya and Van Woods
- “eXtreme Design” in *Proceedings of the ITC@EDU Workshop*, Istanbul Technical University Taşkışla, Istanbul, 8-10 October
- “Support for requirement traceability in design computing: an integrated approach with building data modeling“ in *Proceedings of the ECPPM-04, European Conference on Product and Process modeling in the Building and Construction Industry*, 8-10 September, 2004, Istanbul, Turkey
- “Towards Domain-Oriented Semi-Automated Model Matching For Supporting Data Exchange” (With H. Wang, B. Akinci, J. H. Garrett, Jr. Department Of Civil And Environmental Engineering Carnegie Mellon University, T. Turkaslan-Bulbul, I. Gursel) in the *Proceedings of the ICCCBX Conference*
- “Embedded Commissioning for Building Design” (with T. Turkaslan-Bulbul, I. Gursel, J. H. Garret Jr, B. Akıncı, H. Wang) in the *Proceedings of the ECPPM Conference*, Istanbul Technical University, Taskisla, Istanbul, 8-10 October
- “Formalizing Generation And Transformation In Design: A Studio Case-Study” (with Hoda Moustapha) in the *Proceedings of the DCC04 Conference*, MIT, Boston, 18-22 September
- “Evaluating IFCs for Exchanging Building Commissioning Data: R1.0” (with J. H. Garrett, Jr, B. Akıncı, H. Wang, T. Turkaslan-Bulbul, I. Gorse) *Proceedings of the ICCCBX Conference*
- “Embedded Commissioning For Building Design” (with T. Turkaslan-Bulbul, I. Gursel, J.H. Garrett Jr, B. Akıncı, H. Wang) *Proceedings of the ICEBO Conference*, Paris, France, October 18-20
- 2003 “Comparison of AHSRAE Guidelines with Building Commissioning Practice” (with Tanyel Turkaslan-Bulbul, ShaVon Brown, Edward Kim, Burcu Akıncı, James H. Garrett, Jr.) in the *Proceedings of the National Conference on Building Commissioning*, Saint Luis Obispo, CA. May 8-10
- “Overview of Design Evaluation towards a Comprehensive Computational Approach,” (with M. T. Türkaslan-Bülbül, J. H. Garrett, Jr. , B. Akıncı) *EIA9: E-Activities and Intelligent Support in Design and the Built Environment* Istanbul Technical University, Faculty of Architecture, Taskisla 80191 Taksim-Istanbul, Turkey
- “Electronic requirement management: A framework for architectural requirement engineering,” (with I. Özkaya) *EIA9: E-Activities and Intelligent Support in Design*

- and the Built Environment* Istanbul Technical University, Faculty of Architecture, Taskisla 80191 Taksim-Istanbul, Turkey
- 2002 "Models of design requirement" Proceedings of the *6th International Conference on Design and Decision Support Systems in Architecture and Urban Planning*, held in Landgoed Avegoor Ellecom, The Netherlands, July 7 - 10.
- 2001 "Ethics in architectural design" Proceedings of the *Design in Context* Conference, 5th in the Design Thinking series held at Delft University of Technology, Delft, The Netherlands, December.
- 1999 "Variants of design cognition" Proceedings of the *Knowing and Learning to Design Conference* held at Georgia Institute of Technology, April 27-28. Edited into a book by Chuck Eastman, Mike McCracken, Wendy Newstetter.
- "Spatial reasoning of architecture students with simple three-dimensional arrangements" *Fourth Design Thinking Research Conference* held at MIT, April 23-25, 1999.
- 1998 "Computational building requirements specification in the early stages of design" (with Z Aygen, M Cumming, M Donia, R Sen, Z. Ye and J Garrett) 4th International Conference on Design and Decision Support Systems in Architecture and Urban Planning, Maastricht, The Netherlands, July 26-29.
- "Computational Building Requirements Specification" *Inter-Symp - 98 International Conference on Systems Research, Informatics and Cybernetics*, August 17-21, Baden-Baden, Germany Preconference Proceedings on Advances in Collaborative Decision Support Systems for Design, Planning and Execution.
- "Multi-Representation and Multi-Procedure Based Computational Environments for Creative Design" *4th International Conference on Design Creativity*, Heron Island, Queensland, Australia, organized by The Key Center for Design Computing and Cognition, Sydney Australia. December 7-10
- "Cognition Based Computational Design" *30th Anniversary Meeting of The Key Center for Design Computing and Cognition*, Sydney Australia. December 4
- "Formalization of concurrent performance requirements in building problem composition" (with A Mahdavi and Z. Ye) *4th International Conference on Design and Decision Support Systems in Architecture and Urban Planning*, Maastricht, The Netherlands, July 26-29
- "Challenges for Chinese architects in the Twenty-First Century" *Fifth International Conference on Traditional Dwellings and Settlements*, Cairo, Egypt, December
- 1997 "Paradigms and practice of computer assisted early design" in *CAAD futures 1997: Proceedings of the 7th International Conference on Computer Aided Architectural Design Futures*, 4-6 August, edited by Richard Junge, Kluwer Academic Publishers, Dordrecht, 1997.
- "Case based instruction strategies in the design studio" *Architectural Research Centers Consortium*, Spring Research Conference, 1997, Herberger Center for Design Excellence, College of Architecture and Environmental Design, Arizona State University.
- 1996 "An electronic design assistance tool for case-based representation of designs" (with M. Cumming, M. Shealey, B. Tuncer) proceedings of the *1996 ACADIA Conference* held in Tucson, Arizona, October 31 - November 3
- "Expertise and creativity in architectural design" *International Symposium on Descriptive Models of Design*, July 1-3, Taskisla, Istanbul
- "Sub-focus area 1.1: Project Initiation and Organizational Planning" (with Gary Bates) *CERF Symposium on Environmental Sustainability*, Washington, D.C., February 4-8
- 1995 "A formalism for design versions" to be presented at the *Formal Design Methods for CAD* conference in June 12-16
- "Analyzing the hyper-acclamation: A-h-a-!" (with C. Akin) the *International Roundtable Conference on Computational Models of Creative Design*, Heron Island, Australia, December
- 1994 "Architectural identity in the Chinese vernacular in Yunnan" in proceedings of the *IASTE'94 Conference* (International Association for the Study of Traditional Environments), Tunis, Tunisia, December 17- 21

- "Design protocol data and novel design decisions" (with C. Lin) proceedings of the *Design Studies-Xerox Park Conference on Protocol Analysis*, Delft, The Netherlands, September
- "SEED-PR: A Framework for Automated Architectural Programming" (with R. Sen) *International Conference on Interdisciplinary Research and the 2nd Orwelian Symposium*, Architectural Computing: Technology in Transition, Karlovy Vary, Czech Republic, August
- "Psychology of the early design process" in proceedings of the *Design Decision Support Systems Conference*, Vaals, The Netherlands, August 15-19
- "HeGeL-II: heuristic and optimization based search in early design" (with R. Sen) in proceedings of the *Knowledge Based Environmental Design Systems Symposium of the 7th International Conference on Systems Research, Informatics and Cybernetics*, Baden-Baden, Germany, August 16-17
- 1993 "Determining the impact of computer aided design tools on the building delivery process: A bench marking study," (with Z. Anadol) in the First International Conference on *The Management of Information Technology Conference*, Singapore, 17-20 August
- "An empirical view of the project management process," (with N. Esin and B. Uluoglu) in the First International Conference on *The Management of Information Technology Conference*, Singapore, 17-20 August
- "What's wrong with CAD?" (with Z. Anadol) *4th International Symposium on Systems Research, Informatics and Cybernetics*, Baden-Baden, Germany, August 2-8
- "Dimensions of Architects' expertise," in the *4th International Symposium on Systems Research, Informatics and Cybernetics*, Baden-Baden, Germany, August 2-8, 1993.
- "Architect's reasoning with structures and functions," in the *AAAI-93 Workshop on Reasoning About Function*, Washington, D.C., July 11-12
- "Notes on a formal grammar for representing meaning in architecture," in IFIP WG5.2 Workshop on *Formal Design Methods for CAD* in Tallinn, Estonia, 16-19 June
- 1991 "A structure and function based theory of design reasoning," in *Research in Design Thinking* ed. by N. Cross, K. Dorst, and N. Roozenburg, proceedings of the workshop meeting held at the Faculty of Industrial Design Engineering, Delft University of Technology, the Netherlands, May 29-31
- 1990 "Data interpretation in comprehensive design environments," *Proceedings of the 6th International Conference on Systems Research Information and Cybernetics*, Baden-Baden, West Germany, August 12-16
- "Temporary permanence of traditional settlements," *Proceedings of the Culture-Space-History International Conference*, Middle East Technical University, Ankara, Turkey, July 8-12
- 1989 "Computational design instruction: towards a pedagogy," *Proceedings of the CAAD Futures '89 Conference*, Harvard University, Boston, MA, July 11-14
- "A paradigm for problem structuring in design," *Proceedings of the NSF, Engineering Design Research Conference*, University of Massachusetts at Amherst, June 11-14
- "Idyikut-Schari (Gaochang) and Yar-Khoto (Jiahoe): cross-cultural traditions of Eastern Central Asia," in *Volume Eight, IASTE WP08-89: Historical and Cross-Cultural Studies of Traditional Settlements*, ed. by N. AlSayyah and J.-B. Boudier, Center for Environmental Design Research, 390 Wurster Hall, University of California, Berkeley, CA 94720
- 1988 "Architectural design as task for complex problem solving systems," *Proceedings of the 4th International Conference on Systems Research Information and Cybernetics*, Baden-Baden, West Germany, August 15-21
- "Analytical models for predicting performance in human computer interface," *Proceedings of the CHI-88 Workshop on Analytical models: Predicting the Complexity of Human Computer Interaction*, Washington, D.C., May 14
- "Heuristic generation of layouts (HeGeL) based on a paradigm for problem solving," (with B Dave and S. Pithavadian) *Proceedings of the 3rd International Conference on Applications of AI in Engineering*, Stanford, Palo Alto, California, August 8-11

- "Building manufacturability and robotics," *Proceedings of the Fifth International Symposium on Robotics in Construction*, Tokyo, Japan, June 6-8
- 1986 "A schematic representation of the designer's logic," (with C. Cheng, B. Dave and S. Pithavadian) *Proceedings of the CAD and Robotics in Architecture and Construction Conference*, Paris: Hermes
- "Formal representation of design knowledge and process," (with B. Dave) *Proceedings of the CIB.86 Advancing Building Technology Conference*, Washington, D. C. September
- 1985 "Issues in design support systems for architects," *Proceedings of the 5th International Conference on Decision Support Systems*, San Francisco, California, April 1985.
- 1984 "The role of the computer in architectural education," *Proceedings of the ACSA National Conference*, North Carolina, March
- 1983 "Educating the architect in the eighties," *Proceedings of the North-Central Regional Conference of the ACSA*, Minneapolis, Minnesota, October
- 1982 "Instructional criticism in architectural education," *Proceedings of the Design Policy Conference*, London
- 1981 "Teaching architecture," *Proceedings of the 69th Annual ACSA Conference*, Asilomar, California
- 1978 "How do architects design?" *Artificial Intelligence and Pattern Recognition in Computer Aided Design*, ed. by J. C. Latombe, New York: North-Holland Publishing Co., 1978, pp. 65-104.
- "AIM: Architectural inference maker," *Proceedings of the CAD-78: Computer Aided Design Conference*, Sussex, England, March 1978.
- 1974 "Built form and everyday activity encounters," *Proceedings of the 6th CIB Congress*, Budapest, October 3-10
- 1973 "Contextual fittingness of everyday activity encounters," *Environmental Design Research* Vol. 1 ed. by W. F. E. Preiser, Stroudsburg, Pennsylvania: Dowden Hutchinson and Ross, Inc., 1973. (Also in *Man-Environment Systems*, Vol. 3, no. 3, 1973.)

Manuscripts and Other Publications

- 1997 *Descriptive Models of Design Workshop, Report to NSF* (Grant number INT-9601999) with Ulrich Flemming, Yehuda Kalay, Ardeshir Mahdavi and Fahriye Sancar, Taskisla, Istanbul, Turkey, July 4-5
- 1994 "Computer Aided Facilities Management (CAFM)" in *State of the Art in Computer Applications for Architecture, Engineering and Construction in the USA* Carnegie Mellon University, Department of Architecture, Pittsburgh, PA, September 8
- 1993 "Working Papers I: Case studies for computer aided facilities design and management," (co-authors Zeynep Anadol and James Roche) CBCC publication, Department of Architecture, February 5
- 1990 "Project management and architectural service," Department of Architecture, Carnegie Mellon University, Pittsburgh PA, June 7
- "NSF sponsored research project: design decision making in architectural practice; working paper one: literature survey and preliminary issues," Department of Architecture, Carnegie Mellon University, Pittsburgh PA, May 31
- 1988 *Structuring Architectural Design Problems*, final report to NSF, December
- 1987 "High technology for manufacturability of buildings," (with R Reddy and L Takahashi) Research report, Carnegie Mellon University, Pittsburgh, PA, December
- "A paradigm for problem structuring in design" (with B. Dave and S. Pithavadian; presented at the IFIP Workshop, Boston, Massachusetts) unpublished report, Department of Architecture, Carnegie Mellon University, Pittsburgh, PA, October
- "Problem structuring in architectural design," (with B. Dave and S. Pithavadian) Research Publications, Department of Architecture, Carnegie Mellon University, Pittsburgh, PA
- 1986 "Basic forms of description for design in the developmental stages," presented at Workshop on Machine-Understandable Design Languages, University of Illinois, Champaign, Ill; unpublished report, Department of Architecture, Carnegie Mellon University, Pittsburgh, PA, March

- 1983 "From Ecole des Beaux Arts to College of Fine Arts," unpublished report, Department of Architecture, Carnegie Mellon University, Pittsburgh, PA, January
- 1982 "Summary of user errors at the terminal," (with D. R. Rao), unpublished report, Department of Architecture, Carnegie Mellon University, Pittsburgh, PA
"Social appropriateness and functionality in architecture," unpublished report, Department of Architecture, Carnegie Mellon University, Pittsburgh, PA, June
- 1981 "Handbook: user-responsive environmental design decision making," unpublished course module, Department of Architecture, Carnegie Mellon University, Pittsburgh, PA, January
"Working papers in user computer interface," (with D. R. Rao) Report #-CS-81-140, Department of Computer Science, Carnegie Mellon University, Pittsburgh, PA, April
- 1980 "Understanding as a function of image compression," Report # CS-80-108, Department of Computer Science, Carnegie Mellon University, Pittsburgh, PA
"Teaching design," unpublished report, Department of Architecture, Carnegie Mellon University, Pittsburgh, PA, November
Self-Help Housing in Egypt: A Student Design Competition, USAID, Foundation for Cooperative Housing, Washington, D. C. and Department of Architecture, Carnegie Mellon University, June
"Structural properties of three-dimensional block arrangements," IBS Report #8, Laboratory for Design and Information Processing, Institute of Building Sciences, Carnegie Mellon University, Pittsburgh, PA
- 1979 *Models of architectural knowledge: An information processing model of design*, Ph.D. dissertation, Ann Arbor, Michigan: University Microfilms International
- 1978 "Strategies for developmental tools for instructional criticism in architectural education," unpublished report, Department of Architecture, Carnegie Mellon University, Pittsburgh, PA, June
- 1976 Working papers on knowledge acquisition in image understanding research: "An experimental system for knowledge acquisition in image understanding" (with R. Reddy and R. Ohlander); "An interactive protocol analysis system for knowledge acquisition," (with M. Schultz); "Eye fixations in image understanding;" and "Knowledge Acquisition for Image Understanding Systems" (with R. Reddy); Computer Science Department Reports, Carnegie Mellon University

Editorship

Editorial Reviews

- 2000 *International Journal of Co-Design*, editorial board member.
- 1997 *Design Studies*, editorial board member.
- 1994 *Journal of Architecture and Planning Research*, editorial board member until 1998.
- 1991 *Environment and Planning B: Planning and Design*, Pion Ltd., London; reviewer.
- 1984 *Journal of Architectural Education*, ACSA, 1735 New York Avenue, NW, Washington, D.C.; reviewer and Editorial Board (until 1985).
International Journal of Man-Machine Studies, Academic Press Inc., London; reviewer (until 1985)

Guest Editorships

- 2005 "Education and CAD" guest editorship of the special issue of *Journal of Automation in Construction*
- 1998 "Models of design" a double special issue of the journal of *Automation in Construction* on with contributions from Ömer Akin, Cem Akin, Yehuda Kalay, Lachmi Khemlani, Jin Won Choi, Peter Lloyd, Peter Deasley, Eckhart Frankenberger, Petra Badke-Schaub, and Rianne Valkenburg, Maryliza Mazijoglou, Stephen Scrivener, Malcolm McCullough, Ardeshir Mahdavi, George Sutter, Halime Demirkan, Linden Ball, Louise Maskill, and Thomas Ormerod, 7 (1998) 1.

- 1997 "Descriptive models of design" special issue of *Design Studies* journal with contributions from Rivka Oxman, Ulrich Flemming, Bonnie E. John, Renate Eisentraut, Joachim Günther, Masaki Suwa, Barbara Tversky, Mehmet Göker, Herbert Birkhofer, Nigel Cross, Gabriela Goldschmidt, and Janet McDonnell, 18 (1997) 4.
- 1996 "Design management" a special issue of the *Journal of Architectural and Planning Research* with contributions from David Hawk, Harvey Rabinowitz, Zeynep Sözen, David Haviland, Nur Esin, Belkis Uluoglu, and John Eberhard, 13 (1996) 1.

Public Presentation

Invited Lectures

- 2005 "I'm Not Rem Koolhaas," on the occasion of the 30th Anniversary Convention of the Korean Society of Architects, Daegu, Korea, November 4
- 2004 "CAD@CMU.EDU" opening remarks of the *Generative CAD Systems Symposium*, at Carnegie Mellon University, Pittsburgh, PA, 12-16 July
 "Fundamental Tenets for Architectural Ethics" ACSA Teacher's Conference, Cranbrook, MI
 "eXtreme Design" keynote at ITC@EDU Workshop, Istanbul Technical University 11 September and public lecture at Bilkent University, November 13
 "Building Intelligence" One of Three Lecture at METU, Kubbe Altı, November 3, 2004 and at Bilkent University, November 20
 "Devil is in the Detail: 114 Dead in Kansas City" Two of Three Lecture at METU, Kubbe Altı, November 24
 "I'm Not Rem Koolhaas" Three of Three Lecture at METU, Kubbe Altı, December 1
- 2003 "Future of Computing in Architecture" Panel presentation, *EIA9: E-Activities and Intelligent Support in Design and the Built Environment* Istanbul Technical University, Faculty of Architecture, Taskisla 80191 Taksim-Istanbul, Turkey
- 2002 "The Turkish Nationality Room Project: Memory and Imagination in Architecture" Presented at the Symposium on *Culture Art and Architecture in Ottoman Turkey*, held at University of Pittsburgh and Carnegie Mellon University, September 30
- 2001 SEEK, Software Engineering Evangelists for Korea, summer workshop instructor. Topic: "requirements modeling". Coordinated by John Grasso, Director of Institute for Software Research International, Carnegie Mellon University, July 4-14
 ASCA International Meeting at Istanbul Turkey, June 15
- 2000 "Case Based Instruction in the Classroom", one day seminar for secondary education teachers, organized by the office of the Humanities and Social Sciences Dean, Carnegie Mellon University, April
- 1999 *ART-SCI'99* Conference Held at Cooper union, NYC during November 13-14.
 Key note address, 75th National Independence Day Celebration of Turkey, William Pitt Union Building, October 29
 "Architectural research" *Research Forum*, Hampton University, Hampton, VA, April 9-10
 "Vernacular architecture of Yunnan," Soup and Substance Lecture, *Wats On Art Festival*, Carnegie Mellon University, Pittsburgh, PA, October
 "76th anniversary of the declaration of independence of the Turkish Republic" a commemorative address on behalf of the Turkish-American Student Association, University of Pittsburgh, William Penn Building, October 30
- 1998 "Cognition Based Computational Design" *30th Anniversary Meeting of The Key Center for Design Computing and Cognition*, Sydney Australia. December 4
 "Creativity in design", Invited speaker at the Queensland University of Technology, Design Department seminars, December 6
- 1997 "Case based instruction in the architectural design studio" research seminars series of the Center for Innovation in Learning, Carnegie Mellon University
 "Technologism: A form of *Feng Shui* in Western Architecture" Yunnan Polytechnic University, Kunming, Yunnan. PRC

- 1996 "Anatomy of the design process", The First International Symposium on the Descriptive Models of Design, invited speaker, Taskisla, Istanbul, Turkey, July 1-5
"Vernacular architecture of Yunnan, PRC" Life-long learning program of Carnegie Mellon University, October
- 1995 "Chinese minority architecture" ASIA Festival, Carnegie Mellon University, October
"Design protocol data and novel design decisions" Design Studies-Xerox Park project on Protocol Analysis, Delft, The Netherlands, September
- 1994 "Expertise and early design decisions" Design Decision Support Systems Conference, Vaals, The Netherlands, August
- 1993 "Visual exploration and creativity in design," invited presentation at the Delft Protocols Workshop, September 20-22, 1993, Delft, The Netherlands
"Dimensions of architects' expertise," Educational Testing Service, Princeton, NJ, March 11
- 1990 "Data interpretation in comprehensive design environments," Proceedings of the 6th International Conference on Systems Research Information and Cybernetics, Baden-Baden, West Germany, August 12-16
- 1988 "Architectural design as task for complex problem solving systems," 4th International Conference on Systems Research Information and Cybernetics, Baden-Baden, West Germany, August 15-21
"Expertise about being novice: Explaining the expertise of the architect," Educational Testing Service, Princeton, NJ, March 30
- 1986 "Current developments in design and practice in the USA," Yunnan Institute of Technology Lecture Series, Kunming, Yunnan, Peoples Republic of China, July
"Basic forms of description for design in the developmental stages," Workshop on Machine-Understandable Design Languages, University of Illinois, March
"A formalism for problem structuring and resolution in design," National Science Foundation Symposium on the Computational Foundations of Architecture, January
- 1985 "Introducing advanced technologies: human resource implications," United Nations, UNDP, North-South Roundtable on Development: The Human Dimension, Istanbul, Turkey, September
Series of four lectures on the state of the art in Computer-Aided Design: 1. "Architecture and the computer Age," 2. "State of the art in computer-aided design," 3. "Computer-aided design at Carnegie Mellon University," 4. "Prospects for professional and educational directions" School of Environmental Design, University of Petroleum and Minerals, Dhahran, Saudi Arabia, March
- 1984 "Role of the computer in the building design and delivery process," TUBITAK (Turkish Scientific Research Agency, Ankara, Turkey, December
"Architecture and computing" Fall Lecture Series, School of Architecture, Drury College, Springfield, Missouri, 1984.
"Methods for research and practice in architecture," National Science Foundation Symposium on Doctoral Education for Architectural Research, 1984.
"Place in the Turkish mosque," Spring lecture series, Department of Architecture, Pennsylvania State University, College Park, April 1984.
- 1980 "The Architectural Design Process: State of the Art in Research," Design Research Center Lecture Series, Carnegie Mellon University, January
- 1978 "How do architects design?" IFIP W.G. 5 Working Conference, Grenoble, France, March
- 1977 "Image understanding research at Carnegie Mellon University," 10th Symposium of the Center for Visual Science, University of Rochester, June 16-18
"Architectural design research," School of Architecture, University of Oklahoma, Norman, Oklahoma

Conferences, Workshops and Panels

- 2005 "Embedded Commissioning for Improved Building Operations and Maintenance: Case Studies, Data Models and Exchange for Interoperability" IEA- ANNEX-40 meeting at Prague, CR, October 12

- 2004 "Emerging CAD Processes: The Case of Computer Aided Requirement Management" in Proceedings of the GCADS-04 International Symposium, Pittsburgh, PA, USA, July 12-14, 2004, with Ipek Ozkaya
- "Support for requirement traceability in design computing: an integrated approach with building data modeling" in Proceedings of the ECPM-04, European Conference on Product and Process modeling in the Building and Construction Industry, 8-10 September, 2004, Istanbul, Turkey
- "Embedded Commissioning for Building Design" in Proceedings of ICEBO-2004, Paris, October 14-18, 2004, with Tanyel Turkaslan-Bulbul, Ipek Gursel, James H. Garrett Jr, Burcu Akinci, and Hongjun Wang
- 2002 Chair of the Generative CAD Systems conference
- 2003 Session chairman on "design collaboration and online environments" on Friday October 10, 2:30pm, *EIA9: E-Activities and Intelligent Support in Design and the Built Environment*, Istanbul Technical University, Faculty of Architecture, Taskisla 80191 Taksim-Istanbul, Turkey
- Conference panel speaker on Friday October 10, 4:30pm, *EIA9: E-Activities and Intelligent Support in Design and the Built Environment*, Istanbul Technical University, Faculty of Architecture, Taskisla 80191 Taksim-Istanbul, Turkey
- 2002 "Models of Design Requirement" with Ipek Özkaya, 6th international conference on *Design and Decision Support Systems in Architecture and urban Planning*, Landgoed avegoor, ellecom, the Netherlands. July 7-10
- "CAD@CMU.EDU" Paper solicited by the conference chair Mao-Lin Chiu, to be included in the proceedings of the 2003 CAAD Futures conference held at National Cheng Kung University, Taiwan, 28-30 April
- 2001 "Ethics in Architectural Design" Proceedings of the *Design Thinking: Designing in Context* conference, Delft University of Technology, Stevinweg 1, 2628 CN Delft, The Netherlands, December
- 1999 "Variants of design cognition" *Knowing and Learning to Design Conference* held at Georgia Institute of Technology, April 27-28, 1999.
- "Spatial reasoning of architecture students with simple three-dimensional arrangements" *Fourth Design Thinking Research Conference* held at MIT, April 23-25, 1999.
- 1998 "Computational building requirements specification in the early stages of design" (with Z Aygen, M Cumming, M Donia, R Sen, Z. Ye and J Garrett) *4th International Conference on Design and Decision Support Systems in Architecture and Urban Planning*, Maastricht, The Netherlands, July 26-29.
- "Formalization of concurrent performance requirements in building problem composition" (with A Mahdavi and Z. Ye) *4th International Conference on Design and Decision Support Systems in Architecture and Urban Planning*, Maastricht, The Netherlands, July 26-29, 1998.
- "Multi-Representation and Multi-Procedure Based Computational Environments for Creative Design" *4th International Conference on Design Creativity*, Heron Island, Queensland, Australia, organized by The Key Center for Design Computing and Cognition, Sydney Australia. December 7-10, 1998
- 1997 "Case based instruction strategies in the design studio" *Architectural Research Centers Consortium, Spring Research Conference*, Georgia Tech, Atlanta.
- 1996 "Expertise and creativity in architectural design" *International Symposium on Descriptive Models of Design*, July 1-3, 1996, Taskisla, Istanbul.
- "Sub-focus area 1.1: Project Initiation and Organizational Planning" (with Gary Bates) *CERF Symposium on Environmental Sustainability*, Washington, D.C., February 4-8, 1996.
- 1994 "Cognition of learning" *Teaching Seminars*, Department of Architecture, Carnegie Mellon University, September 1994.
- "SEED-PR: A framework for automated architectural programming" *Knowledge Based Environmental Design Systems Symposium of the 7th International Conference on Systems Research, Informatics and Cybernetics*, Baden-Baden, Germany, August 16-17, 1994.

- "Early stages of design" *International Conference on Interdisciplinary Research on the 2nd Orwellian Symposium, Architectural Computing: Technology in Transition*, Carlsbad-Karlovy Vary, Czech Republic, August 10, 1994.
- "Architectural identity in the Chinese vernacular in Yunnan" *IASTE'94 International Association for the Study of Traditional Environments*, Tunis Conference, Tunisia, December 17- 21, 1994.
- 1993 "What's wrong with CAD?" (with Z. Anadol) in the *4th International Symposium on Systems Research, Informatics and Cybernetics*, Baden-Baden, Germany, August 2-8, 1993.
- "Dimensions of Architects' expertise," in the *4th International Symposium on Systems Research, Informatics and Cybernetics*, Baden-Baden, Germany, August 2-8, 1993.
- "Architect's reasoning with structures and functions," in the *AAAI-93 Workshop on Reasoning About Function*, Washington, D.C., July 11-12, 1993.
- "Notes on a formal grammar for representing meaning in architecture," in *IFIP WG5.2 Workshop on Formal Design Methods for CAD* in Tallinn, Estonia, 16-19 June 1993.
- "Integration of Facilities Management with CAD" presented work as part of Carnegie Mellon University-ASG research team: 1) at Sasolito, CA. (December 1992); and 2) at the *CBCC consortium meeting*, January 1993.
- 1992 "Generation Project" presented at the *Sunbridge Meeting* held at Sparta, Greece as part of the protocol between Carnegie Mellon and the City of Sparta, July 22-25, 1992.
- Convenor of Symposium on Facilities Management at the *IAPS-12 Conference* held at Thessaloniki, Greece; participants: David Saile of the University of Cincinnati, Andrew Seidel of Texas A&M, Necdet Teymur and Martin Symes of University of Manchester; July 11, 1992.
- "An empirical view of the project management process," paper presented during the Symposium on Facilities Management at the *IAPS-12 Conference* held at Thessaloniki, Greece, July 11, 1992.
- "The project management process in Türkiye and the USA." *Workshop on International Architectural Practice* organized by Center for International Architectural Studies, School of Architecture, University of Manchester, Manchester, England, July 7-8, 1992.
- 1990 "Project management and architectural service," *The Istanbul Workshop on Design Management* sponsored by NSF, Carnegie Mellon University and Istanbul Technical University, Istanbul, June 7, 1990.
- "Temporary permanence of traditional settlements," *Culture-Space-History International Conference*, Middle East Technical University, Ankara, Turkey, July 8-12, 1990.
- 1989 "Computational design instruction: towards a pedagogy," *CAAD Futures '89 Conference*, Harvard University, Boston, Mass, July 11-14, 1989.
- "A paradigm for problem structuring in design," *NSF, Engineering Design Research Conference*, Univ. of Massachusetts at Amherst, June 11-14, 1989.
- 1988 "Heuristic generation of layouts (HeGeL) based on a paradigm for problem solving," (with B Dave and S. Pithavadian) *3rd International Conference on Applications of AI in Engineering*, Stanford, Palo Alto, CA, August 8-11, 1988.
- "Analytical models for predicting performance in human computer interface," *CHI-88 Workshop on Analytical models: Predicting the Complexity of Human Computer Interaction*, Washington, D.C., May 1988.
- "Idykut-Schari (Gaochang) and Yar-Khoto (Jiahoe): cross-cultural traditions of Eastern Central Asia," *Traditional Dwellings and Settlements Conference*, University of California, Berkeley, CA, April 7, 1988
- 1987 "Manufacturability of buildings," presentation to Simon Perez, Minister of Foreign affairs, Government of Israel, at Carnegie Mellon University, Pittsburgh, PA, December 1987.
- "A paradigm for problem structuring in design," *IFIP W6.5.2 Workshop on Intelligent CAD*, MIT, Boston Mass. October 6-8, 1987
- "Architectural design process," *EDRC Seminars on Understanding Design Practice*, January 1987

- 1986 "Computing in schools of architecture: problem or opportunity," *ACSA Administrators Conference*, Washington, D.C., November 1986.
 Panelist. *US-PRC Academic and Professional Exchange in Architecture and Planning Workshop*, VPI&SU, Washington/Alexandria Center, October 1986.
 "Expertise of the architect" *The Architects' Computer Conference*, Singapore, May 1986.
 Education and Practice Panel of the *Pennsylvania Society of Architects Convention*, Pittsburgh, PA., 1986
- 1984 "Integrating computers into architectural education," *Computing in Education*, ACSA Administrators Conference, Washington, D.C. December 1984.
 "The role of computers in architectural education," *Technology and the world around us, International Congress on Technology and Technology Exchange*, Pittsburgh PA, October 1984
 "Basic forms of description for design in the development stages," *Workshop on Machine Understandable Design Languages*, University of Illinois, Champaign, Ill. April 1984
 "Methods for research and practice in architecture," *Doctoral Education for Architectural Research*, Workshop funded by NSF (grant # CEE-84-07564), Georgia Institute of Technology, September 1984.
Workshop on Issues in Doctoral Programs in Architecture, ACSA Annual Convention, Charleston, NC, March 19, 1984.
 "A formalism for problem understanding and resolution in design," paper presenter and session chair, *Computational Foundations of Architecture Workshop* sponsored by NSF, UCLA, California, January 1984.
- 1983 "Role models in architectural education," *Symposium on the Role of the Architect in Society*, held at the Pittsburgh Center for the Arts, January 1983.
 "Educating the architect in the eighties," and "The role of the computer in architectural education," two presentations of refereed papers at the *North-Central ACSA conference*, Minneapolis, Minnesota, October 1983.
- 1982 "System friendliness research," *Workshop on rapid prototyping*, Robotics Institute, Carnegie Mellon University, Pittsburgh, PA, March 1982.
- 1980 "Mind, memory and architectural education," *Teacher's Seminar*, Cranbrook Academy, Association of Collegiate Schools of Architecture, American Institute of Architects, June 1980.
- 1978 "AIM: architectural inference making," *CAD-1978, computer-aided design conference* held at Brighton, England, March 1978.
- 1976 "Quantification of three-dimensional structures," with W. G. Chase. Presented at the *Forty-eighth Annual Meeting of the Midwestern Psychology Association*, Chicago, May 6-8, 1976.
- 1973 "Context and activities in the evaluation of buildings," presented at the *IVth Annual Environmental Design Research Association Conference*, Virginia Polytechnic Institute and State University, Blacksburg, VA, April 16-18, 1973.

Teaching

Recently taught courses (see the "repertory" section below)

- 48-765 *AEC Systems Synthesis* (12)
 48-759 *Value Based Design* (12 units)
 48-761 *Software Requirement Engineering* (9 units)
 48-742 *Design Process* (6 units)
 48-711 *Methods and Paradigms of Research in Architecture* (9 units)
 48-551 *Ethical Decision Making in Architecture* (9 units)
 48-510 *Decision Making in Architecture* (9 units)
 48-405 *Architectural Design: Systems Integration* (18 units, coordinator)
 48-400 *Architectural Design: Occupancy* (18 units, coordinator)
 48-105 *Architectural Design: Introduction* (18 units)

Repertory of Courses at Carnegie Mellon University (numerically ordered)

- 99-222 *A Tale of Two Cities -- Analysis (9 units), Synthesis (9 units), and Distance Learning.* (9 units). Primary instructor with participation from several colleges including Professors Joel Tarr, James Garrett, and Indira Nair. This is a series of three courses offered to students of all colleges of Carnegie Mellon University and students from another university (currently from Turkey and Mexico). The course is a multi disciplinary analysis and synthesis course considering situated problems such as bridges, urban areas, demographic patterns, industrial pollution, and so on. The purpose of the course is to indicate the richness of problem solving in situated contexts and demonstrate the significance of cross cultural interpretation of local problems.
- 99-102 *Pattern and Design* (9 units). A university *core course* dealing with the interdisciplinary foundations of design. Co-taught with Professors Achenbaum, Bernstein, Midani, Newell, and Steinberg.
- 48-765 *AEC Systems Synthesis* (12units) The project course deals with synthesis in solving AEC problems using the tools, theories, and methods studied in the prerequisite courses. In this respect, it is a synthesis of the degree program, itself. Sponsors from government agencies, NGOs or the private sector will be invited to underwrite real or realistic facility or design management problems. Students and faculty will work in teams to formulate and resolve problem defined by these entities, which will serve as "clients". At the end of the semester student groups will present their work to the clients and develop a self-evaluation of their work.
- 48-761 *Software Requirement Engineering* (12 units) A new course offered to Software Engineering and Architecture graduate students, dealing with the requirements elicitation and modeling for software development. The course is jointly offered with James Tomayko and follows the contents of the text "Managing Software Requirements" by Leffingwell and Widrig, Addison, Wesley: 2001
- 48-759 *Value Based Design* (12 units). Design adds value to products. AEC products are no exception to this. Usability created through unique plan layouts (as in Bauhaus residences), striking building imagery manifested through novel forms and building materials (as in the Sydney Opera House or the Guggenheim Museum in Bilbao), unique and innovative building technologies perfected through trial and error (as in caissons used in the construction of the Brooklyn Bridge or the design build strategies used in the Crystal Palace), and impressive interior spaces made to impress the occupants (as in cathedrals of the past or the hotel atrium spaces of the 80s) are examples of such design added value. This course will use quantitative modeling strategies (including stochastic and linear programming techniques) to analyze, explain, predict and control design value creation in the AEC industry. Specifically it will cover: requirement modeling, planning, risk and utility analysis, intuitive methods of design and (de)value- engineering.
- 48-742 *Design Process* (6 units) This is a graduate course introducing students to descriptive models of the design process in a variety of disciplines, including engineering, design, architecture, social science, and planning. After a review of seminal literature in the area, the course focuses on methods for developing design models, and computer aided design and design instruction systems. Assignments require students to critique present literature and conduct limited empirical studies investigating the design process.
- 48-734 *Human Factors in Physical Design* (9 units) a required course in the Advanced Building Studies program dealing with sociological factors in design. Course included a review of the seminal works of the environmental psychology movement, such as Proshansky, Sanoff, Sommer, Esser, Hull.
- 48-711 *Research Models and Methods in Architecture* (6 units, subsequently raised to 9 units) This course continues a long tradition, begun more than twenty years ago, of the introduction of incoming graduate students to research in architecture and to faculty in the department. It provides the first formal instruction of graduate students

- in structuring research questions following in the traditions of Western science; and in communicating their ideas in academic and professional terms.
- 48-551 *Ethical Decision Making in Architecture* (9 units) A new version of 48-510 was designed for the 4th and 5th year students using the case study approach. Decision making and ethical issues in architectural design are illustrated and discussed in terms of significant building cases. Seven formal case studies are used to deliver material in the class room. Theoretical material on decision making, ethics, expertise and creativity is provided to support the case studies. Assignments require students to interpret these case studies and prepare new ones in teams.
- 48-510 *Decision Making in Architecture* (9 units) A new version of 48-320 was designed for the 5th year students using the case study approach. Decision making and ethical issues in architectural design are illustrated and discussed in terms of significant building cases. Harvard Business School's case based instruction methods are adapted to the architectural domain. Nine formal case studies are used to deliver material in the class room. Theoretical material on architectural programming, building design, and building engineering is provided to support the case studies. Assignments require students to interpret these case studies as well as prepare new ones in groups.
- 48-501,502 *Design Studio and Theory of Architecture* (18 units + 9 units): required courses for first year of the first professional Masters Program; introducing the students to architectural design and theory. Co-taught with William Mitchell.
- 48-405 *Architectural Design: System Integration*. (18 units) This studio focuses on systems integration. The purpose is to give students a positive experience in developing exciting design solutions with the full exploration of the role and impact of building systems in producing the architecture intended by the students. Collaboration by other fellow faculty and outside consultants is a key part of this course. In addition, computer assisted media are also an important part of this studio. A new initiative is the electronic design assistance tool (EDAT) was developed for Spring 1996 and used in subsequent years. This is a case-based design environment for integrating systems in design through examples of and improvements over past designs.
- 48-400 *Architectural Design: Occupancy* (18 units) This studio focuses on user needs and their satisfaction through building design. The purpose is to give students a positive experience in developing design solutions that address building usability, building codes, and ADA. Collaboration by other fellow faculty and outside consultants is a key part of this course. In addition, computer assisted media are also an important part of this studio. A new initiative to be implemented in 2000 is a software system being developed at Carnegie Mellon University for the early stages of design, called SEED. The architectural programming module, SEED-Pro, will be used to employ seamless transition from programming to design and back, particularly during the early stages of architectural design.
- 48-345 *Psychology of Design* (9 units) An elective course looking at the architectural design process as information processing. Successor to the Architectural Design Activities course (48-345*).
- 48-345* *Architectural Design Activities* (9 units) An elective course dealing with the architectural design process as information processing. Introduces the principles of cognitive science and investigates routine and creative design in terms of the cognitive mechanisms of designers.
- 48-320 *Decision Making in Architecture* (9 units) Originally offered in 1989 under the title of "Rational Decision Making." Over the years there have been two major revisions of this course. Now, in addition to the change in its title, it is more of a "hands on," case-based course on cognitive tools of design decision making rather than a theoretical one about design process. Since its inception, the course has been supported by a text specifically developed for it.
- 48-300,301 *Architectural Design* (18 units): required courses dealing with a set of problems, including campus buildings, an arts and crafts center in Pittsburgh, housing in Egypt, and a conservatory.

- 48-300* *China, Summer Abroad Program* (18 units + 9 units) Directed and taught two courses in the summer abroad program of the Department, at the Yunnan Technical Institute, Kunming, Yunnan with the participation of 17 students from US, one US and several PRC faculty. Offered two courses as part of the regular Carnegie Mellon University curriculum on Chinese architecture and history. Program repeated in 1997 with 11 students. Co-taught both times with Henry Hanson.
- 48-140 *Design Science Theory* (9 units): a course dealing with design decision making and design delivery processes; an introductory course in the Design Science Sequence established in 1982.
- 48-105 *Introduction to Architecture* (18 units) freshmen design studio co-taught with Bruce Lindsey. This studio is structured in three segments: analysis, synthesis and design-build. The analysis problem deals with a small building program of 4-5,000 sq.ft. Students use multi-media to explore issues of spatial sequence, including physical and Form-Z, drawings and models. The synthesis problem is of a similar scale requiring work at a proxemic urban site dealing with spatial experiences of users. Representation requirements are similar to the analysis problem. Design and build problem directed by Scott Smith involves the construction of a stool in the wood shop.
- 48-100,101 *Introduction to Architecture* (18 units, each): freshmen design studio for the Bachelors of Architecture program. Co-taught with William Durkee, Steve Smith, Steve Lee, Karen Markison, Henry Hanson, Mary Beth Barrett and Harry Levine.

Schedule of Course Assignments at Carnegie Mellon University

| Year | Spring | Fall | Summer |
|------|------------------------|------------------------|----------------|
| 2006 | 48-551, 48-759 | TBA | |
| 2005 | 48-551, 48-759, 48-765 | 48-400, 48-711, 48-765 | |
| 2004 | 48-551, 48-762, 48-759 | sabbatical | |
| 2003 | 48-551 | 48-761, 48-711 | 48-300, 48-400 |
| 2002 | 48-405, 48-551 | 48-761, 48-711 | |
| 2001 | 48-105, 48-551 | 48-761, 48-711 | |
| 2000 | 48-510 | 48-400, 48-711 | |
| 1999 | 48-510 | 48-400, 48-711 | |
| 1998 | 48-742, 48-510 | 48-400, 48-742 | 99-222 |
| 1997 | 48-405; 48-742 | 48-400 | 48-300* |
| 1996 | 48-405; 48-742 | 48-400 | |
| 1995 | 48-405; 48-742 | 48-711 | |
| 1994 | 48-405 | 48-711; 48-320 | |
| 1992 | 48-405 | 48-711; 48-320 | |
| 1991 | 48-405 | 48-711; 48-320 | |
| 1990 | 48-305 | 48-711; 48-320 | |
| 1989 | 48-305 | 48-711; 48-320 | |
| 1988 | sabbatical | 48-300; 48-711 | |
| 1987 | 48-101 | 48-100 | |
| 1986 | 48-101; 99-102 | 48-100 | 48-300* |
| 1985 | 48-101; 48-502 | 48-100 | |
| 1984 | 48-101; 48-502 | 48-100; 48-140 | |
| 1983 | 48-101; 48-502 | 48-100; 48-140 | |

| | | | |
|------|----------------|----------------|------------------------|
| 1982 | 48-101; 48-502 | 48-100; 48-140 | |
| 1981 | 48-501; 48-502 | 48-100; 48-140 | |
| 1980 | 48-301; 48-734 | 48-501; 48-502 | |
| 1979 | 48-301; 48-734 | 48-300; 48-345 | remedial design studio |
| 1978 | 48-301; 48-734 | 48-300; 48-345 | 48-300; 48-345* |

Other Teaching

- 1976 *Planning and Management* (Fall 1976; teaching assistant): a required course dealing with rational methods and principles of planning for B. Arch. students.
- 1971 *SIMSOC: gaming and simulation for architects* (Fall 1971; adjunct instructor) an elective course for B. Arch. students, School of Architecture, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.
- 1969 *Junior year design studio* (Spring 1969; teaching assistant) Faculty of Architecture, Middle East Technical University, Ankara.

Educational Advising

Ph.D. Advising (Carnegie Mellon University)

| | | |
|------------------|-----------------|--|
| Fernanda Leite | Role: principal | Status: pre-candidacy |
| Sang Hoon Lee | Role: principal | Status: candidacy |
| Tanyel Türkaslan | Role: principal | Status: Proposal: "a prototype for building commissioning" |
| Ipek Ozkaya | Role: principal | Status: completed "requirement and design management in architecture" |
| Hoda Moustapha | Role: principal | Status: Proposal: computer aided architectural massing |
| Halil Erhan | Role: reader | Status: Proposal: computer aided architectural programming |
| Michael Cumming | Role: principal | Status: completed, "process modeling in building design" |
| Ashwini Bhide | Role: reader | Status: candidacy |
| Rana Sen | Role: principal | Status: defaulted to MSc degree. |
| Safwan Aly | Role: reader | Status: completed, autonomous agent based design, 2000 |
| Suresh Bhavnani | Role: reader | Status: completed: "How architects draw with computers," 1999 |
| Ye Zhang | Role: principal | Status: completed, "Functional decomposition in architecture," 1999 |
| Zeyno Aygen | Role: reader | Status: completed: "A hybrid model for case indexing and retrieval in building design," 1999 |
| Magd Donia | Role: principal | Status: completed, "Computational modeling of design requirements for buildings," 1998 |
| Cheng-Fen Chien | Role: reader | Status: completed, "Supporting information navigation in generative design systems," 1998 |
| Chang-Shia Chiou | Role: reader | Status: completed, "Computational considerations of historical architectural analysis," 1996 |
| Sergio Sedas | Role: reader; | Status: completed, "Algorithms for automatic sensor placement," 1993 |
| Can Baykan | Role: reader | Status: completed, "Formulating Spatial Layout as a Disjunctive Constraint Satisfaction Problem," 1991 |
| Chiu-Shui Chan | Role: principal | Status: completed, "The Psychology of Architectural Style," 1990 |

Ph.D. Advising (External Readership)

Don Coffelt Civil and Environmental Engineering Status: candidacy

| | |
|-----------------|--|
| C. Tantisevi | Civil and Environmental Engineering Status: proposal |
| Semiha Kızıldağ | Civil and Environmental Engineering Status: candidacy |
| Esin Evgin | Civil and Environmental Engineering, completed. |
| Taysheng Jeng | Georgia Institute of Technology, College of Architecture; status: completed, 1998, Thesis title: "Design coordination modeling." |
| Mustafa Mezughi | Mackintosh School of Architecture, UK, Status: in progress |
| Vesna Popovic | University of Sydney, The Key Center for Design Computing. Status: completed, 1997. Thesis title: "Expert and novice user's models." |
| Donna Cuomo | SUNY, Buffalo, Department of Design; status: completed 1988. Thesis title: "A Study of Human Performance in CAAD", |

Master of Science Advising (Carnegie Mellon University)

| | |
|------------|--|
| 2005-2006 | Gauvar Deshmukh, MSc CAD students |
| 2004-2005 | Sanath Kalidas, Divya Oberoi, Ipek Gürsel, Patrick Anderson (BFA) |
| 2003-2004 | Shavon Brown, Edward Kim, Abhijit Nigudkar |
| 2002-2003 | Li-Heng Chen, Tzu-Chung Hsieh, SangWon Lee, Kirk Mitchell |
| 2000-2001 | Pattra Smithacorn, Jason Brooks. |
| 1999-2000 | The entire Master's class |
| 1998-1999 | The entire Master's class |
| 1997-1998: | James Kuo, Alma Nora Livas, Ipek Ozkaya, Brian Proffitt, Çigdem Sagdic, Frank-Li Wang, Hoda Moustapha, Beran Gürtekin, Scott Gomez, Kamal Mubarak |
| 1996-1997: | Hoda Moustapha, Chao-hua Chang, Antonio Garate, Beran Gürtekin, Scott Gomez, Kamal Mubarak, James Kuo |
| 1995-1996: | Hoda Moustapha, Chao-hua Chang, Antonio Garate |
| 1994-1995: | Kallirro Deligianni, Chengtah Lin, Hariyuki Fuji |
| 1993-1994: | Kallirro Deligianni, Chengtah Lin, Hariyuki Fuji, Roland DeFilippi |
| 1993-1994: | Chengtah Lin, Haryuki Fuji (Philosophy Department), Roland DeFilippi, Patric McKiernan (undergraduate) |
| 1992-1993: | Zeyno Aygen, Shang-Chia Chiou, Seung-Jo Han, Chengtah Lin, Vivanti Santosa, Teng-Wen Chang, Robert Courson, Yong-Gi Shin |
| 1991-1992: | Zeynep Anadol, Seongju Chang, Shang-Chia Chiou, Chui-Ju Chung, Seung-Jo Han, Chanwan Jo, Jay Shakanvaram, Pei-Yu Wang, Hui-Krung Yang |
| 1990-1991: | Raghu Bhat, Luke Fikioris, Churn-Der Hwang, Hui-Krung Yang |
| 1989-1990: | Raghu Bhat, Mikako Harada, Yi-Hsien Yen, Hinh Yin, Gamil Serag-Eldin, Luke Fikioris, Churn-Der Hwang, Janice D. Gobert (Department of Educational Psychology, McGill University) |
| 1988-1989: | Bharat Dave, Raghu Bhat, Mikako Harada, Yi-Hsien Yen, Hinh Yin, Gamil Serag-Eldin |

Professional Work

| | |
|------|--|
| 2006 | Site and estate planning for Dar- Essalam, Pittsburgh, PA |
| 2003 | Lisa Andersen House addition, Silver Spring, MD |
| 2002 | Architect of Record for the Turkish Nationality Room to be installed at the Cathedral of Learning in the next few years: duties include coordinating of a diverse set of constituents including the Facilities and Construction Office at PITT, Nationality Rooms Office at PITT, client groups in Pittsburgh, Technical Committee of design and historical experts, fund raising groups in Pittsburgh and Turkey, and technical design consultants. |
| 2001 | Chairman of the technical design committee, Turkish Nationality Room project, Cathedral of Learning, University of Pittsburgh PA 15213. |
| 1999 | Salem's Meat Market: a three story commercial and residential building in Oakland, Pittsburgh. In collaboration with Hanson Associates |
| 1996 | Williamsburg city center competition entry, with John Decker. |
| 1992 | Computerized NCARB licensing examination, external consultant to ETS, Princeton. Until 1996. |

- 1992 Muslim Student Association, Oakland, Pittsburgh: purchase and renovation of the existing Jehowa's Witness Church into the Dar-Essalam Mosque. Status: completed in 1993.
- 1990 Commonwealth of Pennsylvania, National War Memorial Design Competition.
- 1987 Islamic Center of Pittsburgh, Monroeville, Pittsburgh: an architectural commission for a spiritual and cultural center for the Islamic community of Western Pennsylvania. Scope: total of 10,000 sq.ft. building, including prayer hall, school and multipurpose rooms; 9.1 acre land developed into recreation, parking and cemetery facilities. Status: incomplete.
- 1983 Student Services Building Design Competition, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.
- 1981 Pittsburgh Center for the Arts Design Competition, Pittsburgh, Pennsylvania, with Al Filoni, Ken Lee, Ben Gianni and Don McLaughlin.
- 1979 Villa for Dr. Bushnak, for a young CEO, and his family, Riyadh, Saudi Arabia. Scope: 5,000 sq.ft., building; one acre, grounds. Status: completed in 1981.
- 1979 Office building to house the headquarters of The Saudi Center Inc., an engineering and construction firm, Riyadh, Saudi Arabia. Scope: 20,000 sq.ft., building; negligible grounds. Status: complete.
- 1979 Al-Basnawy Trust Building , Madina, Saudi Arabia. Scope: 100,000 sq.ft; an eight story, one city block apartment complex with parking at ground, commercial at first and second and residential at upper levels. Status: complete.
- 1972 Private residence for Dr. McGee, Head and Professor at the Chemical Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Scope: 2,500 sq.ft, building. Status: completed in 1973.
- 1971 Office of Physical Plant Planning, Virginia Polytechnic Institute and State University, Blacksburg, VA; designer and acting director. Scope: Developed programming and evaluation studies of existing campus facilities; designed and coordinated new construction and renovation projects, including a research observatory, office, classroom and laboratory spaces; participated in the preparation of the campus master plan in consultation with The Architects Collaborative of Boston, MA. Until 1973.
- 1969 Master Plan for the new campus of the University of Adana, Adana, Turkey. Scope: Conducted preliminary research and prepared guidelines for the design and implementation of the new campus for 10,000 students. Until 1970.
- 1968 Two residences and a dormitory for the personnel of the University of Ankara, Turkey. Scope: 200 sq.m. and 1,000 sq.m., respectively. Status: completed in 1969.
- 1968 Municipal government center building in Amasya, Turkey, design competition submission with Haluk Pamir.
- 1968 Municipal government center building in Konya, Turkey, design competition submission with Haluk Pamir.
- 1967 Residence for a Danish industrialist, under the supervision of Prof. Gehrtd Bornebusch, Copenhagen, Denmark. Scope: 600 sq.m., building; several hectars, grounds. Status: complete.

Honors, Awards, Exhibits

- 2002 1st place in the YMCA National meet held at Fort Lauderdale, Florida, for the 1650, 55+ men's event; total of eight All-American placements in one meet
- 2001 2nd place overall in the AMAYMC, Regional meet, March, 31.
- 2000 "Design Peek" an exhibit at the Regina Gouger Miller gallery of Carnegie Mellon University, dealing with the analysis and simulation of architects' design behavior.
"Three in One" an exhibit at the AIA Galleries, 204 9th Avenue, Pittsburgh dealing with the artifacts and designs for the historical Carrie Steel Mill, in Homestead, PA.
Collaborators: Timothy Kaulin, sculptor, and Charlee Brodsky, photographer.
- 1999 Phi Kappa Phi, honor society inductee; nominated by students, May 15, 1999

- 1998 YMCA All-American, National Swim Meet, Fort Lauderdale, FL: seventh place in the 200 yard, free, men's relay
- 1995 *Excellence in Satisfying Customers Certificate of Merit*, Andy Awards, given out by the president of Carnegie Mellon University on October 12, 1995.
- 1994 Islamic Center of Western Pennsylvania, Monroeville, project entry in the "Pittsburgh Architects - Circa 90s" show, Heinz Architectural Center, The Carnegie (March - May 1994).
- 1995 Provost for Education's award for courseware development.
- 1995 YMCA All-American, National Swim Meet, Buffalo, NY: second place in the 200 yard, medley, relay
- 1979 Recipient of the first Ph.D. degree in the Department of Architecture, Carnegie Mellon University.
- 1973 Fellowship to pursue graduate education, Carnegie Mellon University, Pittsburgh.
- 1972 Representative of Turkey and Virginia Polytechnic Institute and State University at the Williamsburg International Assembly, VA.
- 1970 Fulbright Fellowship for graduate studies in the USA.
- 1967 Selected to represent Turkey with a project entitled 'Mass Housing at Ankara, Turkey,' at the Biannual Convention and student competition of the Union of International Architects (UIA), held at Prague, Czechoslovakia.
- 1966 Master Plan for the City of Adana Design Competition, Turkey, under the direction of Professor Gulgonen. Status: honorable mention awarded.
- 1964 Graduated from high school, Tarsus American College, 2nd in academic ranking.
- 1963 Turkish National Swimming Team: represented Turkey in a national swimming meet in Haifa, Israel and in the Student Olympics in Budapest, Hungary.

Sabbatical Activities (Fall 2004)

During my sabbatical, I principally worked on the completion of my book *Ethical Decision Making in Architecture* by collecting data on existing case studies, identifying and documenting new case studies, and writing some of the key chapters of the book. I was able to collect primary source data for the following case studies at the following locations, institutions:

| Case Study | Source | Location | Dates |
|--|--|--|--|
| Kansas City Hyatt Regency Kansas City, MO | Shugat Thompson and Killroy, P.C.; and Judge Tim O'Leary | Kansas City, MO | Third week in August 2004 |
| Kocatepe Camii, Ankara -- new case study | Ilhan Tekeli; Abdi and Sebnem Guzer | Middle East Technical and Bilkent Universities, Ankara | September 2004 |
| Gök Kafes, Istanbul, Gök Gina, Mersin -- new case study | Doruk Pamir | Istanbul and Mersin | Early October and November 2004 |
| Crystal Palace, London | National Art Library, Victoria and Albert Museum; and Alistair Cameron | Victoria and Albert Museum, S. Kensington, London; and Joseph Paxton Society, London | Second week in October 2004 |
| Sydney Opera House | Jan Utzon; and Claus M. Smidt | Pausian Furniture Exhibition Store, Kalkbraederilobskaj, Denmark; and Danmarks Kunsbibliotek | Third and fourth weeks in October 2004 |
| Hancock Tower, Boston | William Porter; Dan Schodek; Boston Public Library | MIT; Harvard; and The Boston Public Library, Boston, MA | December 2004 |
| Pruitt-Igoe | Joseph Heathcott | Exhibit at MIT organized by | December 2004 |

Primary data collection on my manuscript continues in most of these cases. The only notable exception to this is the Kansas City Hyatt Building for which I have stopped collecting more data. It is effectively complete. Writing of the chapters is in a similar state as well. The Kansas City Hyatt Regency chapter is ready. Sydney Opera House, Hancock Tower, and Crystal Palace chapters are substantially complete -- they need some minor work. I also gave public lectures, taught a short course at Bilkent University; and visited Middle East Technical University, Istanbul Technical University and TUBITAK (NSF of Turkey).

Personal Milestones

- 1980 Twins born: a girl, Ayça, and a boy, Mete.
- 1972 First child born: a boy, Cem.
- 1970 Married to Meral Altay.
- 1946 Born in Eskisehir, Turkey, to parents Ali Kemal Akın and Fazilet Akın.