

<http://code.arc.cmu.edu/~mdg>

EDUCATION

Massachusetts Institute of Technology Ph.D. Design Theory & Methods 1986
Dissertation title: *Design as Exploring Constraints*; committee: NJ Habraken, A Fleisher, S Papert
Massachusetts Institute of Technology B.S., Architectural Design 1978

PROFESSIONAL EXPERIENCE

2004 – present **Carnegie Mellon University**
Professor, Computational Design (School of Architecture)
2008 – present **Modular Robotics, LLC**
co-founder and director of research of a robotics construction toy company
1999 - 2004 **University of Washington, Seattle**
Professor (from Sept 2002), Department of Architecture
1990 - 1999 **University of Colorado, Boulder and Denver**
Associate (1997-1999) and Assistant (1990-1997) Professor, College of Architecture
and Planning, Department of Planning and Design
1998 **Nara Advanced Institute of Science and Technology, Nara, Japan**
Visiting Research Scholar, Cognitive Science Lab, Information Systems Division
1988 - 1990 **Design Technology Research, Cambridge, MA and Tokyo**
Principal Investigator
1981 - 1988 **Massachusetts Institute of Technology**
Lecturer & Postdoctoral Research Associate, School of Architecture and Planning
1982-1984 **Atari Cambridge Research Laboratory, Cambridge, Massachusetts**
Research Staff, Computers and Education
1981 **Logo Computer Systems Inc, Boston, MA**
Programming Language Design, Computer Animation
1980 - 1981 **Technical University of Eindhoven (SAR)**
Visiting Researcher
1978 - 1980 **MIT Artificial Intelligence Laboratory**
System Programmer, Logo Project
1976 - 1978 **The Architecture Machine Group, MIT**
Undergraduate Research Assistant

REFEREED JOURNAL ARTICLES

to appear **Experiments in Design Synthesis when Behavior is Determined by Shape**, Schweikardt, E and Gross, MD *J Personal and Ubiquitous Computing, special issue on Material Computing*
to appear **Hyperform Specification: designing and interacting with self-reconfiguring materials**, Weller, M, Gross, MD, and Goldstein SC *J Personal and Ubiquitous Computing, special issue on Material Computing*
2009 **Computational Support for Sketching in Design: A Review**, Johnson, G., Gross, M.D., Hong, J. and Do, E. Y-L. *Foundations and Trends in Human-Computer Interaction*, 2(1): 1-93
Educating the New Makers: Cross-disciplinary creativity, M.D. Gross, and Do, E Y-L. *Leonardo* 42(3) (June 2009).
ArchidNA: An Interactive System for Creating 2D and 3D Conceptual Drawings in Architectural Design, Kwon, Doo Young, M.D. Gross, and Do, E Y-L. *J. Computer Aided Design* 41(3):159-172 (March 2009)

- 2006 **FlexM: Designing a Physical Construction Kit for 3D Modeling**, Markus Eng, Ken Camarata, Ellen Yi-Luen Do, Mark D Gross, *International Journal Architectural Computing*, **4**(2):27- 47
- Energy Cube and Energy Magnets**, Ken Camarata, Ellen Yi-Luen Do, Mark D Gross, *International Journal Architectural Computing*, Volume 4, Number 2, pp 49- 66
- 2004 **Let there be light**, E. Y-L Do and M. Gross, *International Journal Architectural Computing*, Volume 2, Number 2, 1 June 2004 pp 211: 227
- 2003 **A Physical Computing Studio: Exploring Computational Artifacts and Environments**, K Camarata, M Gross, E Y-L Do *International Journal Architectural Computing* **1**(2):169-190.
- Design of Software and Software for Design**, M. Gross and Y. Yamamoto, *Journal of the Human Interface Society* (in Japanese)
- 2001 **Thinking with Diagrams in Architectural Design**, Do, E. Y-L and M.D. Gross, in *Artificial Intelligence Review* **15**:135-149.
- 2000 **Drawing on the Back of an Envelope: a framework for interacting with application programs by freehand drawing**, M.D. Gross and E. Do. in *Computers and Graphics Journal* **24**(2000):835-849.
- Intentions in and Relations among Design Drawings**, Do, E. Y-L, Gross, M.D., Neiman, B., Zimring, C., *Design Studies*, 21 (5):483-503.
- Digital Clay: Deriving Digital Models from Freehand Sketches**. Schweikardt, E., and Gross, M.D., *J. Automation in Construction* 9:107-115. (first appeared in Proceedings of ACADIA '98 National Conference, Quebec)
- 1999 **From Critiquing to Representational Talkback: Computer Support for Revealing Features in Design**, Nakakoji K, Yamamoto, Y., Suzuki, S., Takada, S., Gross, M., *Knowledge Based Systems*, 457-468.
- 1998 **Collaboration and Coordination in Architectural Design: approaches to computer mediated work**, Gross, M.D., E. Do, R. McCall, W. Citrin, P. Hamill, A. Warmack, and K. Kuczun. *J. Automation in Construction* 7:465-473. (first appeared in Proceedings 1997 TeamCAD conference, Atlanta GA).
- 1997 **Resolving archaeological site data with 3D computer modeling: The case of Ceren**, Lewin, J. and M.D. Gross, *J. Automation in Construction*, 6(4) 323-334. (first appeared in Proceedings 1996 ACADIA National Conference, Tucson AZ).
- 1996 **Why can't CAD be more like Lego?** Gross, M.D., *Automation in Construction Journal*, 5:285-300.
- The Electronic Cocktail Napkin - computer support for working with diagrams**, Gross, M.D., *Design Studies* **17**(1), 53-70.
- PDA based Graphical Interchange for Field Service and Repair Workers**, Citrin, W.V., and M.D. Gross, *Computers and Graphics*, **20**(5):641-649.
- 1994 **Avoiding conflicts in architectural subsystem layout**, Gross, M.D., *Journal of the Concurrent Engineering Research Association* **2**:163-171.
- Roles for Computing in Schools of Architecture and Planning**, Gross, M.D., *Journal of Architectural Education*, **48**(1):56-64.
- EML: A Modeling Environment for Exploring Landscape Dynamics**, Theobald, D. and M.D. Gross. *Computers, Environment, and Urban Systems*, **18**(3):193-204
- 1988 **Concept Design Games**, Habraken, N.J. and M.D. Gross, *Design Studies* **9**(3):150-158.
- Constraints: Knowledge Representation in Design**, Gross, M.D., S. Ervin, J. Anderson, A.Fleisher, *Design Studies* **9**(3):133-143.

- 1987 **RoadLab - A Constraint-based Laboratory for Road Design**, Gross, M.D. and S. Ervin, *Artificial Intelligence in Engineering Journal*, **2**(4): 224-234.
- 1984 **A Computer Model for Design**, Gross, M.D., *Design Studies* **3**(5):142-145.
Design as the Exploration of Constraints, Gross, M. and A. Fleisher, *Design Studies* **3**(5),137-138.
Writing Form, Gross, M.D. and N.J. Habraken, *Design Studies* **3**(5).
- 1982 **The Turtle Tissue Project**, Gross, M.D. and N.J. Habraken. *Open House International*, **7**(2):3-12.

CONFERENCE PAPERS IN PEER-REVIEWED PROCEEDINGS

- 2009 **State Machines are Child's Play: Observing children ages 9 to 11 playing Escape Machine**, Weller, M., Do, E. Y-L., Gross M., ACM Interaction Design for Children (IDC), Como Italy, 282-289
Tangible Sketching in 3D with Posey, Weller, M., Do, E. Y-L., Gross M., ACM Human Factors in Computing (CHI) Interactive Demonstrations: April 4-6. 3193-3198
Easigami: A reconfigurable folded-sheet TUI, Huang, Y., Gross, M.D. Do, Y-L., Eisenberg, M. ACM Tangible and Embedded Interaction (TEI), Cambridge UK, Feb 16-19. 107-112.
A Tangible Construction Kit for Exploring Graph Theory, Schweikardt, E., Elumeze, N., Eisenberg, M., Gross, M., ACM Tangible and Embedded Interaction (TEI), Cambridge UK, Feb 16-19. 373-376.
An Optocoupled Poseable Ball and Socket Joint for Computationally Enhanced Construction Kits, Weller, M.P., E YL Do, and M. Gross. ROBOCOMM, IEEE 2nd International Conference on Robotic Communication and Coordination, Odense Denmark, March 2009.
Delivery types and communication modalities in the furniture factory design critiquing system, Oh Y, Do, EY-L, Gross, MD, Ishizaki, S, Proc. Computer Aided Architectural Design Futures (CAAD Futures), Montreal, June 17-19.
- 2008 **Computing Spatial Qualities in Architecture**, Key, S., Do, E. Y-L., Gross, M., Proc. Association for Computer Aided Design in Architecture (ACADIA), Minneapolis, MN Oct 15-17.
Learning About Complexity with Modular Robots, Schweikardt E. and Gross, M. Proc. IEEE Digital Game and Intelligent Toy Enhanced Learning (DIGITEL), Banff, Canada November 16-19. pp.116-123
Posey: Instrumenting a Poseable Hub and Strut Construction Toy, Weller, M.P., Do, E. Y-L., and Gross, M.D. Proceedings, Tangible and Embedded Interaction 2008 (TEI), Bonn, Germany, pp 39-46.
The Robot is the Program: Interacting with roBlocks, Schweikardt, E., and Gross, M.D., Proceedings, Tangible and Embedded Interaction (TEI) 2008, Bonn, Germany, pp 167-168.
Computer-aided Critiquing Systems: Lessons Learned and New Research Directions, Oh, Y., Gross, M.D., and Do, E. Y-L., Proc. Computer Aided Architectural Design Research in Asia (CAADRIA), Chiang-Mai, Thailand
Escape Machine: Building a tangible state machine game controller with Posey, Weller, M.P., Do, E. Y-L., and Gross, M.D. ACM Conference on Interaction Design for Children (IDC) Chicago, IL, June 2008.
A Perspective on Computer Aided Design after Four Decades, Earl Mark, Gross, M.D., Goldschmidt, G. in 26th international conference on Education in Computer-Aided Architectural Design in Europe (eCAADe), Antwerp, Sept 17-20, 2008. pp. 169-178.

- 2007 **Environments for Creativity – A Lab for Making Things** Gross, M.D. and Do, E. Y-L. Proceedings, ACM SIGCHI Creativity and Cognition 2007, pp. 27-36
- Why Toys Shouldn't Work Like Magic: Children's Technology and the Values of Construction and Control** Gross, M.D. and M. Eisenberg, Proceedings First IEEE workshop on Digital Game and Intelligent Toy Enhanced Learning (DIGITEL) 2007, Jhongli Taiwan, March 26-28 2007, pp. 25-32.
- A Brief Survey of Distributed Computational Toys**, Schweikardt, Eric and M.D. Gross, Proceedings First IEEE workshop on Digital Game and Intelligent Toy Enhanced Learning (DIGITEL) 2007, Jhongli Taiwan, March 26-28 2007, pp. 57-64.
- Strategies for Research about Design: a multidisciplinary graduate curriculum**, Gross, Mark D., S.Finger, J.Herbsleb, M.Shaw, Proc. 2nd Intl Conf on Design Science Research in Information Systems & Technology (DESRIST), Claremont CA, May 13-15 2007
- roBlocks: Understanding Emergent Complexity from the Bottom Up**, Schweikardt, Eric and M.D. Gross, RSS 2007: Robotics Science and Systems Workshop on Research in Robots for Education, June 27-30, 2007, Atlanta, GA.
- 2006 **roBlocks: A Robotic Construction Kit for Mathematics and Science Education**, Schweikardt, Eric and M.D. Gross, Proceedings ACM International Conference on Multimedia Interaction (ICMI), Banff, Canada, Nov 2-4 2006, pp. 72-75.
- The Designosaur and the Furniture Factory**, Yeonjoo Oh, Gabe Johnson, Mark D Gross and Ellen Yi-Luen Do, in *Design Computing and Cognition*, (ed) John S Gero, Springer, pp. 123-140
- Flow Select: A Time-Based Selection and Operation Technique for Sketching Tools**, Gabe Johnson, Mark D Gross, Ellen Yi-Luen Do, International Conference of Advanced Visual Interfaces (AVI 2006) Venice, Italy, May 23-26, 2006
- 2004 **3 R's of Drawing and Design Computation**, M. Gross and E. Y-L Do, Design Computing and Cognition, J. Gero (ed), Kluwer, Cambridge Massachusetts, pp 613-632
- A Computationally Enhanced Play Board for Group Interaction**, O. Shaer, B. Ziraknejad, K. Camarata, E. Y-L. Do, M. Gross. (poster) Pervasive 2004, Vienna
- As if You Were Here – Intelligent Annotation in Space: 3D Sketching as an Interface to Knowledge Based Systems**, E. Y-L. Do, M. Gross, American Association for Artificial Intelligence (AAAI), Fall Symposium Oct 22-24
- Critiquing Design Sketches**, Y. Oh, E. Y-L. Do, M. Gross, American Association for Artificial Intelligence (AAAI), Fall Symposium Oct 22-24
- 2003 **MouseHaus Table, a Physical Interface for Urban Design** (poster) , Chen-Je Huang, Ellen-Yi Luen Do, Mark D Gross, Proc. User Interface Software Tools (UIST) 2003, Vancouver, CA
- Light Pen: Sketching light in 3D**, Thomas Jung, Mark D. Gross, Ellen Yi-Luen Do, Computer Aided Architectural Design Futures 2003, Tainan, Taiwan
- MouseHaus Table** (poster) Chen-Je Huang, Ellen Yi-Luen Do, Mark D Gross, Computer Aided Architectural Design Futures 2003, Tainan, Taiwan
- Window Seat** (poster), YeonJoo Oh, Ellen Yi-Luen Do, et al., Computer Aided Architectural Design Futures 2003, Tainan, Taiwan
- Junk Mail to Spam Converter** (poster), Michael Weller, Ellen-Yi-Luen Do, Jim Nicholls, Mark D. Gross, Fifth International Conference on Ubiquitous Computing, Seattle WA, ACM: 229-230.

- 2002 **Physical Computing: A Design Studio Bridging Art and Engineering**, Ken Camarata, Mark D. Gross, Ellen Yi-Luen Do, Proc. Int'l Conf. of the Learning Sciences (ICLS) 2002 (Seattle, WA) pp. 520-521.
- Computationally-Enhanced Construction Kits for Children: Prototype and Principles**, Michael Eisenberg, Ann Eisenberg, Mark Gross, Khomkrit Kaowthumrong, Nathaniel Lee, and Will Lovett, Proc. Int'l Conf. of the Learning Sciences (ICLS) 2002 (Seattle, WA). pp. 79-85.
- Sketching Annotations in 3D on the Web** T. Jung, E. Do, and M. Gross, ACM Conference on Human Factors (SIGCHI), ACM Press, pp. 618-619.
- Navigational Blocks: Tangible Navigation of Digital Information**, K. Camarata, E. Do, M. Gross, B. Johnson, ACM Conference on Human Factors (SIGCHI), ACM Press, pp. 751-752.
- Annotating and Sketching on 3D Web Models**, T. Jung, E. Do, and M. Gross, ACM Intelligent User Interfaces 2002, San Francisco, Jan 13-16, ACM Press, pp 95-102.
- Navigational Blocks: Navigating Information Space with Tangible Media**, K. Camarata, E. Do, M. Gross, B. Johnson, ACM Intelligent User Interfaces 2002, San Francisco, Jan 13-16, ACM Press, pp 31-38.
- 2001 **Smart Objects: Constraints and Behaviors in a 3D Design Environment**, D. Eggink, M. Gross, E. Do, in Proceedings of 19th Conference on Education in Computer Aided Architectural Design in Europe, Helsinki, August 31, 2001, pp 460-465.
- FormWriter: A Little Language for Generating Three-Dimensional Form Algorithmically**, Gross, M.D., in B. de Vries, J. van Leeuwen, and H. Achten. *Proc. Computer Aided Architectural Design Futures 2001, Eindhoven, Netherlands*. Kluwer Academic Publishers, pp. 577-588.
- The Design Amanuensis: an Instrument for Multimodal Design Capture**, Gross, M.D. Do, E. Y-L., and Johnson, B.R., in B. de Vries, J.P. van Leeuwen, and H.H. Achten. *Proc. Computer Aided Architectural Design Futures 2001, Eindhoven, Netherlands*. Kluwer Academic Publishers, pp. 1-13.
- Gesture Modelling: Using Video to Capture Freehand Modeling Commands**, Gross M.D. and A. Kemp, in B. de Vries, J.P. van Leeuwen, and H.H. Achten. *Proc. Computer Aided Architectural Design Futures 2001, Eindhoven, Netherlands*. Kluwer Academic Publishers, pp. 33-46.
- Space Pen: Annotating and Sketching on 3D Models on the Internet**, Jung, T., Gross M.D., and Do, E., in B. de Vries, J.P. van Leeuwen, and H.H. Achten. 2001. *Proc. Computer Aided Architectural Design Futures 2001, Eindhoven, Netherlands*. Kluwer Academic Publishers, pp. 257-270.
- Emergence in a Recognition Based Drawing Interface**, Gross, M.D., in *Visual and Spatial Reasoning II*, J. Gero, B. Tversky, T. Purcell, eds., Key Centre for Design Cognition and Computing, Sydney Australia, pp. 51-65.
- 2000 **Beyond the Low-hanging Fruit: Information Technology in Architectural Design, Past, Present, and Future**, Gross, M.D., Do, E.Y., and Johnson, B.R., Proc. ACSA Technology Conference 2000, Cambridge MA, pp. 100-106.
- Place Based Web Resources for Historic Buildings**, M. A. Ehrhardt and M.D. Gross, *Proc. Education in Computer Aided Architectural Design in Europe (eCAADe) 2000*, Weimar, Germany, pp. 177-179.
- 1999 **Collaborative Design with NetDraw**, Dongqiu Qian and M.D. Gross, *Proceedings of Computer Aided Architectural Design Futures '99*, G. Augenbroe and C. Eastman, eds., Kluwer, Dordrecht, the Netherlands, pp. 213-226.
- Immersive Redlining and Annotation of 3D Design Models on the Web**, T. Jung, E. Do, and M.D. Gross, *Proceedings of Computer Aided Architectural Design Futures '99*, G. Augenbroe and C. Eastman, eds., Kluwer, Dordrecht, the Netherlands, pp. 81-98.

- Drawing and Design Intentions — an Investigation of Freehand Drawing Conventions in Design**, E. Do, M.D. Gross, and C. Zimring, in *Proceedings Design Thinking Research Symposium*, G. Goldschmidt and W. Porter, eds., Cambridge MA, pp. 1-10.
- Sketches and Their Functions in Early Design: A Retrospective Analysis of Two Houses**, Neiman, B. Do, E. and M.D. Gross. In *Proceedings Design Thinking Research Symposium*, G. Goldschmidt and W. Porter, eds., Cambridge MA, pp. 255-266.
- Integrating Digital Media in Design Studio: Six Paradigms**, Gross, M.D. and E. Do., *Proc. American Collegiate Schools of Architecture (ACSA) National Conference '99*, pp. 144-148.
- 1998 **Digital Clay: Deriving Digital Models from Freehand Sketches**. Schweikardt, E., and Gross, M.D., Digital Design Studios: Do Computers Make A Difference? ACADIA 98, T. Seebohm and S. V. Wyk, eds, *Association for Computer-Aided Design in Architecture*, Quebec City, pp. 202-211
- Representational Talkback: An Approach to Support Writing as Design**, Yamamoto, Y., Gross, M.D., Takada, S., Nakakoji K, *IEEE Asia Pacific Computer Human Interaction (APCHI) Conference*. IEEE, Los Alamitos, CA, pp.125-131.
- The Ceren Web Resource: Enabling Students to Become Anthropologists In A Virtual Site**, Lewin, J. Ehrhardt, M. and M.D. Gross, *ACM Conference on Computer Graphics (SIGGRAPH 98) Educators Program*, pp. 42-43.
- 3D Modeling of Historic Makkah: Strategies for Constructing Accurate CAD Models of Historic Buildings**, N. Koshak and Gross, M.D., in *Proc. CAADRIA 98 (The Third Conference on Computer Aided Architectural Design Research in Asia)*.
- 1997 **Support for Mobile Pen-Based Applications**, Citrin, W.V., M.D. Gross, P. Hamill, and A. Warmack, *Proc. Third ACM/IEEE International Conference on Mobile Computing and Networking (MobiCom'97)* 241-247.
- Network Design Tools and Tasks**, Kuczun, Kyle and M.D. Gross, *Proc. ACM Conference on Designing Interactive Systems*, Amsterdam, pp. 215-222.
- Tools for visual and spatial analysis of CAD models**, Do, E. and M.D. Gross, *Computer Assisted Architectural Design Futures '97*, R. Junge, ed., Kluwer, Dordrecht, pp. 189-202.
- Not Just Another Pretty Face: Image and argument in an archaeological web site**, Lewin, J., M. Erhardt, and M.D. Gross, *Computer Assisted Architectural Design Futures '97*, R. Junge, ed., Kluwer, Dordrecht, pp. 635-654.
- MUD: Exploring Tradeoffs in Urban Design**, Parker, L., A. Elliott, and M.D. Gross, *Computer Assisted Architectural Design Futures '97*, R. Junge, ed., Kluwer, Dordrecht, pp. 373-388.
- Digital Sketchbooks for Collaborative Design**, W. Citrin, P. Hamill, M.D. Gross, and A. Warmack, Collaboration and Coordination in Architectural Design: approaches to computer mediated work, *TeamCAD symposium on collaborative CAD*, Graphics, Visualization, and Usability Center, Georgia Tech. May 12-13, 1997, pp. 213-217.
- Collaboration and Coordination in Architectural Design: approaches to computer mediated work**, Gross, M.D., E. Do, R. McCall, W. Citrin, P. Hamill, A. Warmack, and K. Kuczun. *TeamCAD symposium on collaborative CAD*, Graphics, Visualization, and Usability Center, Georgia Tech, May 12-13, 1997, pp. 17-24.
- Inferring Design Intentions from Sketches**, Do, E. and M.D. Gross, *Proceedings of Computer Aided Architectural Design Research in Asia '97*, pp. 217-227.
- 1996 **Elements that Follow Your Rules: Constraint Based CAD layout**, Gross, M.D., *Proceedings of Association for Computer Aided Design in Architecture (ACADIA) '96*, Tuscon, AZ, pp. 115-122.

- Resolving archaeological site data with 3D computer modeling: The case of Ceren**, Lewin, J. and M.D. Gross, *Proceedings of Association for Computer Aided Design in Architecture (ACADIA) '96*, Tucson, AZ, pp. 255-266.
- Ambiguous Intentions: A paper-like interface for creative design**, Gross, M.D. and E. Do., *Proc. ACM Conf. on User Interface Software Technology (UIST) '96* Seattle, WA, pp. 183-192.
- Reasoning about cases with diagrams**, Do, E. and M.D. Gross, American Society of Civil Engineers (*ASCE*) *3rd Congress on Computing in Civil Engineering*, Anaheim CA, J. Vanegas and P. Chinowsky, eds., pp. 314-320.
- Drawing as a means to design reasoning**, Do, E. and M.D. Gross, *Artificial Intelligence in Design (AID) '96 Workshop on Visual Representation, Reasoning and Interaction in Design*, Palo Alto, CA.
- Demonstrating the Electronic Cocktail Napkin**, Gross, M.D. and E. Do, *Conference Companion, ACM Conference on Human Factors in Computing (CHI '96)*, Vancouver, pp. 5-6.
- Distributed Architectures for Pen-Based Input and Diagram Recognition**, Citrin, W. and M.D. Gross, *ACM Conference on Advanced Visual Interfaces '96*, pp. 132-140.
- 1995 **Drawing Analogies - Supporting Creative Architectural Design with Visual References**, Gross, M.D. and E. Do, in *3d International Conference on Computational Models of Creative Design*, M-L Maher and J. Gero, eds., Sydney: University of Sydney, pp. 37-58.
- Drawing Analogies: Finding visual references by sketching**, Do, E. and M.D. Gross, *Proc. Association Computer Aided Design in Architecture (ACADIA), 1995 National Conf.*, Seattle, pp. 35-52.
- Shape Based Reminding as an aid to Creative Design**, Do, E. and M.D. Gross, *Global Design Studio Computer Aided Architectural Design Futures '95*, M. Tan and R. Teh, eds., National University of Singapore: Singapore, pp. 79-89.
- 1994 **The Fat Pencil, the Cocktail Napkin, and the Slide Library**, Gross, M.D., *Proc. Association for Computer Aided Design in Architecture (ACADIA), 1994 National Conf.*, St Louis, pp. 103-113.
- Stretch-A-Sketch, a dynamic diagrammer**, Gross, M.D., in A. Ambler, ed., *IEEE Symposium on Visual Languages 1994*, pp. 232-238.
- Recognizing and Interpreting Diagrams in Design**, Gross, M.D., in T. Catarci, M. Costabile, S. Levialdi, G. Santucci eds., *Advanced Visual Interfaces '94*, ACM Press, pp. 89-94.
- Using Diagrams to Access a Case Base of Architectural Designs**, Gross, M.D., C. Zimring, and E. Do., in J. Gero, ed., *Artificial Intelligence in Design '94*, Kluwer, pp. 129-144.
- 1992 **Graphical Constraints in CoDraw**, Gross, M.D., *IEEE Workshop on Visual Languages*, Seattle, pp. 81-87.
- 1991 **Grids in Design and CAD**, Gross, M.D., in G. Goldman and S. Zdepski, eds., *Proceedings ACADIA 91 - Reality and Virtual Reality*, Los Angeles, pp. 33-43.
- 1990 **Knowledge-Based Support for Subsystem Layout in Architectural Design**, Gross, M.D., in Gero, J., ed., *Proceedings 1990 Conference on Artificial Intelligence in Engineering — Design*, Southampton: Computational Mechanics Press.
- Buildings, Memory, and Wayfinding**, Gross, M.D. and C. Zimring, *Environmental Design Research Association (EDRA) Conference*, Champaign-Urbana, Illinois, pp. 85-93.
- Relational Modeling: A Basis for Computer-Assisted Design**, Gross, M.D., in McCullough, Mitchell and Purcell, eds., *The Electronic Design Studio*, Cambridge, MA: MIT Press, pp. 123-136.
- 1987 **Designing With Constraints**, Gross, M.D., J. Anderson, S. Ervin, A. Fleisher, in *The Computability of Design*, Y. Kalay, ed., New York: Wiley and Sons, pp. 53-83.

INVITED ARTICLES AND BOOK CHAPTERS

- 2009 **Editor's Introduction: Back to the real world—Tangible interaction for design**, Do, E-Y and M. Gross, *Artificial Intelligence for Engineering, Design, Analysis, and Manufacturing (AI-EDAM)*, 23, 221-223.
- Now More Than Ever: computational thinking and a science of design**, Gross M.D., *JSSD: Journal of the Japanese Society for the Science of Design*, Vol 16-2 No 62
- Thinking with Diagrams in Architectural Design**, Do EY-L, Gross MD, in special student edition of "The Diagram," *Architectural Review*, p 50-54, printed by the Concrete Centre
- 2008 **Teletables and Window Seat: bilocative furniture-based interfaces**, Oh, Y., Camarata, K., Weller, M., Gross, M., Do, Y-L. in TYL Theng and H. Duh, *Ubiquitous Computing: Design, Implementation and Usability*, Idea Group Publishers.
- 2004 **Between Worlds: Visions and View for the Future of CAD**, Ellen Yi-Luen Do and Mark D Gross, in *Generative CAD Systems*, Edited by Ö. Akin, R. Krishnamurti, and K.P. Lam, pp. 61-78, Carnegie Mellon University (ISBN 0-9762941-0-9)
- 2004 **Diagramming and Drawing in Computer Aided Design** – entry for the *Encyclopedia of Human-Computer Interaction*, Berkshire Publishing Group.
- 2003 **How is a piece of software like a building? Toward general design theory and methods.** Position paper for National Science Foundation workshop on Science of Design: Software Intensive Systems, Virginia, Nov 2-4.
- 2002 **An Interactive Guide to Ancient Cerén Before the Volcano Erupted** Jen Lewin, Mark A. Ehrhardt, Mark D. Gross, and Payson Sheets CD-ROM, University of Texas Press
- 1999 **Drawing, Seeing, and Reasoning: The Added Value of Computer Aided Architectural Design**, Gross, M.D., in *Proceedings Second Conference on Added Value of Computer Aided Architectural Design (AVOCAAD)*, Brussels, 8-10 April, 1999, [keynote], pp. 26-33.
- 1998 **Sketchy (Informal) Interfaces for Design of Intelligent Systems**, Gross, M.D., in *Trends and Controversies, IEEE Intelligent Systems (formerly IEEE Expert)* May, pp. 10-19.
- Smart House-** In *Encyclopedia of Housing*, W. van Vliet--, ed Sage, pp. 546-547.
- Computer Assisted Design** - In *Encyclopedia of Housing*, W. van Vliet--, ed., Sage, pp. 75-76.
- 1995 **Diagram Query and Image Retrieval in Design**, Gross, M.D. and E. Do, in *Proceedings, 2nd IEEE International Conference on Image Processing*, vol II: 308-311.
- Indexing visual databases in architecture with diagrams**, Gross, M.D., in A. Koutamanis, H. Timmermans and I. Vermeulen, eds., *Visual Databases*, Aldershot: Avebury, pp. 1-14.
- 1992 **Predicting wayfinding in buildings - a schema-based approach**, Gross, M.D. and C. Zimring, in Y. Kalay and L. Swerdlhoff, eds., *Evaluating and Predicting Design Performance*. New York: Wiley, pp. 367-378.

- 1991 **Searching for the Environment in Environmental Cognition Research**, Gross, M.D. and C. Zimring, in Evans and Gärling, eds. *Environmental Cognition and Action*, Oxford University Press. pp. 78-95.

Constraint Based Design Environments for Architecture and Engineering, Gross, M.D., *Proceedings SOBRACON 1991 Conference on Computer Graphics in Architecture and Engineering Construction*. São Paulo. [keynote address]

A New Learning Environment: the NeoMuseum. Ueda, N. and M.D. Gross, *Proceedings International Conference on Hypermedia and Interactivity in Museums*, Pittsburgh, pp. 169-178.

- 1987 **Design and Use of a Constraint-Based Laboratory for Learning Design**, Gross, M.D., in *Artificial Intelligence and Education*, R. Lawler and M. Yazdani eds., New Jersey: Ablex, pp. 167-181.

BOOK REVIEWS

- 1998 Designing Digital Space by Daniela Bertol, *Computer Aided Design Journal* **30**(1):91.
- 1995 Electronic Color by Richard Norman. *Journal of Architecture and Planning Research* **12**(4):386-387.
- 1993 Visual Methods in Design Research by H. Sanoff. *J. Architecture and Planning Research* **10**(4):269-70.

PROCEEDINGS AND OTHER NON-REFEREED VOLUMES

- 2009 **Tangible Interaction in Design**, editor (with EY-L Do) special issue of *Artificial Intelligence in Engineering Design, Analysis, and Manufacturing (AI-EDAM)*.
- 2007 Strategies for Research about Design: a multidisciplinary graduate curriculum, Gross, M.D. Finger, S., Herbsleb, J., Shaw, M., in Humboldt State University (CA) Science of Design Workshop
- 2007 Creative Design Computing, Gross, M.D. Do, E., in Humboldt State University (CA) Science of Design Workshop
- 2007 roBlocks: Understanding Emergent Complexity from the Bottom Up, Eric Schweikardt and Mark D Gross, Robotics Science and Systems, Workshop on Robots for Education, Atlanta June 30
- 2004 FlexM, Designing a Physical Construction Kit for 3D Modeling, M. Eng, K. Camarata, E. Y-L Do, M. Gross, in Proceedings on CD ROM, Generative Computer Aided Design Systems conference, Carnegie Mellon University, Pittsburgh July 11-14.

Design Evaluator, Critiquing Freehand Sketches, Y. Oh, E. Y-L. Do, M. Gross, in Proceedings on CD ROM, Generative Computer Aided Design Systems conference, Carnegie Mellon University, Pittsburgh July 11-14

- EspressoCAD, a System to support the design of dynamic structure configurations, M. Weller, E. Y-L Do, M. Gross, in Proceedings on CD ROM, Generative Computer Aided Design Systems conference, Carnegie Mellon University, Pittsburgh July 11-14
- Artifacts for Displaying Home Energy Use, K. Camarata, D. Bregel, E. Y-L. Do, M.. Gross, in Proceedings on CD ROM, Generative Computer Aided Design Systems conference, Carnegie Mellon University, Pittsburgh July 11-14
- 2001 *Tools and Conceptual Frameworks for Early Stages of Design*, Workshop Proceedings, ACM CHI '01 (Human Factors in Computing) conference, Seattle WA, Nakakoji, K. Gross, M.D., Candy, L., Edmonds, E., eds.
- 1992 *Equitable and Sustainable Habitats, Proceedings of the 23d annual meeting of the Environmental Design Research Association (EDRA-23)*, Arias, E. and Gross, M.D. eds., April 7-12 1992, Boulder
- 1989 *Spatial Coordination Demonstration Program*, Gross, M.D.; N.J. Habraken; C. Fry; and M. Ruano, Final Project Report to Shimizu Corporation (3 volumes).
- Designing and Designing Knowledge in Engineering and Architecture: Final Report to the National Science Foundation*, Bucciarelli, L., S. Ervin, A. Fleisher., G. Goldschmidt, M.D. Gross, D. Schön, G. Wiggins, Grant # 8611357-DMC.
- 1988 *Concept Design Games* (volume 1: *Defining*; volume 2 *Playing*), Habraken, N.J., Gross M.D. et al, final report to the National Science Foundation.
- 1986 *Design as Exploring Constraints*, Gross, M.D., Ph.D. dissertation, Massachusetts Institute of Technology.

IN REVIEW

- Scupelli, P., Xiao, Y., Gross, M., Kiesler, S., & Fussell, S. (2008). The physical environment of operating room coordination: Field studies and design principles for information hotspots, *Journal of Computer Supported Collaborative Work*.

TECHNICAL REPORTS

- 2007 Design Research Summer School report to the National Science Foundation (Gross, Finger, Herbsleb, Shaw); http://code.arc.cmu.edu/~johnsogg/drss_wrapped/
- 2001 Final report to National Science Foundation, Back of an Envelope Project, Grant # IIS-96-19856 and IIS-00-96138. Gross, M.D.
- 2000 The PlaceMaker, Design Machine Group Technical Report, Gross, M.D.
- 1999 Collaboratively Annotating 3D Design Worlds Design Machine Group Technical Report, Gross, M.D. E, Do, T. Jung.
- Sketch that Scene for Me: Creating Virtual Worlds by Freehand Drawing, Design Machine Group Technical Report, Gross, M.D., E. Do.

- 1997 HyperSketch II, Final report to Colorado Advanced Software Institute, Gross, M.D. and M. Dalrymple, Undergraduate Research Grant.
- PDA based graphical interchange for field service and repair workers, Gross, M.D., W. Citrin, P. Hamill, A. Warmack, and S. Laufmann, Final report to Colorado Advanced Software Institute.
- 1996 Drawing as an Interface to Knowledge Based Design, Gross, M.D., J. Lewin, E. Do, K. Kuczun, and A. Warmack, final report of a Colorado Advanced Software Institute Undergraduate Research Grant.
- 1993 User Interfaces with Intelligent Objects, Gross, M.D. and Boyd, C., Colorado Advanced Software Institute Technical Report
- 1992 Constraints Provide Domain Behavior in a Construction Kit, Gross, M.D. and Boyd, C. University of Colorado Computer Science Technical Report (CU-CS-583-92).
- 1989 Summary Report CM2: A Constraint Based Design Environment, Ervin, S., M.D. Gross, and A. Fleisher. in Bucciarelli, L.; S. Ervin; A. Fleisher.; G. Goldschmidt; M.D. Gross; D. Schön; G. Wiggins *Designing and Designing Knowledge in Engineering and Architecture: Final Report to the National Science Foundation, Grant #DMC-86-11357.*
- CM2: A Constraint Manager for Design Exploration on the Macintosh, Ervin, S., and M.D. Gross, in Bucciarelli, L.; S. Ervin; A. Fleisher.; G. Goldschmidt; M.D. Gross; D. Schön; G. Wiggins *Designing and Designing Knowledge in Engineering and Architecture: Final Report to the National Science Foundation, Grant #DMC-86-11357.*
- 1981 SAR/LOGO Tissue Model, Gross, M.D. and J. Kapteijns, S.A.R. Working Paper.

NON-REFEREED PAPERS

- 2007 Gross, M. D. (2007). Designers Need End-User Software Engineering. End-User Software Engineering, Dagstuhl, Germany, Internationales Begegnungs- und Forschungszentrum fuer Informatik (IBFI), Schloss Dagstuhl, Germany.
- 1999 Freehand Drawing as an Interface to Knowledge Based Design, Gross, M.D. and E. Do, in Proc. Human-Computer Interface Grantees Workshop '99, K. Stanney and G. Strong, eds., Orlando FL, Feb. 21-23, pp. 162-163
- 1998 The Sundance Lab: Design Systems of the Future, Do, E. and M.D. Gross, *Association for Computer Aided Design in Architecture Quarterly*, December 1998
- 1997 Thinking with Diagrams in Architectural Design, Do, E. and M.D. Gross, paper for Thinking with Diagrams workshop, Alan Blackwell, chair Portsmouth, UK.
- 1995 Avoiding Conflicts in Subsystem Layout, Gross, M.D., NSF Grantees Conference, San Diego
- 1993 CAD in Education, Gross, M.D., in *ACADIA Quarterly*.
- 1989 Automated Coordination for Construction Management, Gross, M.D., *Proceedings of the Conference International Batiment (CIB)* Paris.

BROCHURES, CATALOGS, AND OTHER PUBLICATIONS

- 2001 Design Machine Group, project work catalog at University of Washington's Design Machine Group.
- 1999 Introduction to Into 3D with form•Z: Modeling, Rendering, and Animation by Lachmi Khemlani, McGraw Hill, Gross, M.D.
- 1998 Multimedia Unplugged: A Learning Design Workshop, Workshop Catalog, NeoMuseum, Yoshino, Japan.
- 1998 KosmoPolis MultiOptikon, Workshop Catalog, Istanbul from Taksim to Sultanahmet Square. Yildiz Multimedia Workshop.

VIDEOTAPES AND ELECTRONIC PUBLICATIONS

- 2001 SpacePen, Videotape demonstration, Jung, T., E. Do, and M.D. Gross
Digital Sandbox, Videotape demonstration, Harris, R., E. Do, (production M.D. Gross)
- 1999 Digital Clay, Videotape demonstration (5:00), Gross, M.D. and E. Do
Collaborative Design with NetDraw, Videotape demonstration (6:00), Gross, M.D., D. Qian, & E. Do
the Electronic Cocktail Napkin, Videotape demonstration, Gross, M.D. and E. Do
Architects for the Twenty-first Century: Race, Class, and Culture, Videotape (30:00) of workshop held at University of Colorado, March 13,1999, Gross, M.D., J. Ramos, and A. Fabrikant.
Immersive Redlining, Videotape demonstration (8:55), Gross, M.D., T. Jung, E. Do, J. Davidson.
The Ceren Web Resource (CD-ROM) and Web Site (<http://ceren.colorado.edu>), Gross, M.D., Sheets, P., Lewin, J., and Ehrhardt, M.
The Pyramids of Knowledge (CD-ROM) and Web Site. Thomas Jung, Developer; Project Supervisors Mark D. Gross and Ellen Yi-Luen Do.
- 1998 the Hagia Sophia Web Resource, Gross, M.D. and M.Ehrhardt., interactive Web site
<http://depts.washington.edu/dmachine/istanbul>
KosmoPolis MultiOptikon: Istanbul from Taksim to Sultanahmet Square, interactive Web site
Gross, M.D. and Lewin, J. (with students from Yildiz Technical University)
<http://depts.washington.edu/dmachine/kosmopolis>
- 1997 Local Area Networks Tools and Tasks, Videotape demonstration, Gross, M.D. and K. Kuczun.
- 1996 Ambiguous Intentions: Contextual Recognition, Gross, M.D. & E. Do, Video (8:00) demo.

INVITED TALKS AND PRESENTATIONS

- 2009 Keynote: Eurographics Workshop on Sketch-Based Interaction and Modeling, New Orleans, August 1, 2009
- 2007 Invited participant: Dagstuhl (Germany) Workshop on End User Software Engineering
Invited talk: Brown University Pen-Centric Computing Center, Symposium on Pen-Centric Computing.
- 2006 Keynote: How to better design things and how to design better things? Danish HCI Symposium, Aarhus Denmark, Nov 15, 2006
- 2003 Invited Lecture: The Legacy of Horst Rittel: toward a science of design, computationally expressed. Design Theory & Methods Symposium, University of California, Berkeley, Oct 3-4, 2003.
- 2002 Keynote: Design, Computation, and the Interface - at Software Symposium 2002, Matsue, Japan (national conference of the Japan Software Engineering Association). July 17 2002
Lecture: from computing to design and back again - NTT Communication Sciences Research Lab, Kyoto, Japan. July 22, 2002
Lecture: Design, Computation, and the Interface - University of Tokyo, Research Center for Advanced Science and Technology, July 15, 2002
Lecture: Design Machine Group: current work Architecture Department, Carnegie Mellon University, March 4, 2002
- 2001 Lecture: Current Work at the Design Machine Group (with E. Do, B. Johnson, T. Jung) – Industrial Design Department, Technical University of Delft, July 12, 2001
Workshop co-organizer: (with L. Candy, E. Edmonds, K. Nakakoji) Tools and Conceptual Frameworks for Early Stages of Design ACM CHI '01 (Human Factors in Computing) conference, Seattle WA, April 1, 2001
Lecture: Sketchy Interfaces, ACM SIGCHI (Association for Computing Machinery: Special Interest Group in Computer Human Interaction), Puget Sound Chapter, Feb 22, 2001
- 2000 Lecture: Information in Place - invited speaker, Society for Technical Communication, Puget Sound Chapter, Nov 14, 2000
Invited Lecture: Collective Creativity and Interactive Systems in Design, Sakigake workshop on Collective Creativity, Nara Japan, August 7-8, 2000
Keynote address: Research and Computer Aided Design, DRN2000 - Design Research in the Netherlands 2000, Eindhoven, the Netherlands, May 24-25, 2000
- 1999 Keynote address: Design and Human-Computer Interaction, IHC'99 (Brazilian Human-Computer Interaction society), Campinas, Brazil, October 19, 1999
McKinley Invited Lecture: Architecture in the Digital Age: Creativity, Method, and Computer Aided Design, University of Washington, Seattle, October 7, 1999

- Keynote address: Drawing, Seeing, and Reasoning,, Second International AVOCAAD Conference: the added value of computer aided architectural design, Brussels, Belgium, April 8-10, 1999
- Panelist, Launch Party and Discussion Forum for the ATLAS Millennium Web Site, Front Porch Series, Department of Fine Arts, University of Colorado, 18 March, 1999
- 1998 Lecture and Invited workshop Digital Representations of Place at Yildiz Technical University, Istanbul, May 1- 5, 1998
- Lecture: Computer Aided Design Research at the Sundance Lab, College of Architecture, Georgia Institute of Technology, March 20, 1998
- Lecture: Human Computer Interaction and Computer Aided Design College of Computing, Georgia Institute of Technology, March 19, 1998
- Computer Aided Design in Architecture, Department of Architecture, University of Washington, March 9, 1998
- Lecture: Sketching as Media for Interacting with Computers in Design at Computer Science Department, Tokyo Institute of Technology, February 23, 1998
- Lecture: CAD Tools for Collaboration at Communication Department, Tama Art University, Tokyo, February 22, 1998
- Lecture: Interactive Tools for Design at Nara Advanced Institute of Science and Technology, Jan 17, 1998
- 1997 Lecture: PDA based graphical interchange for field service and repair workers, Colorado Advanced Software Institute, Phipps Mansion, Denver, Colorado.
- Invited Talk The Design Studio, Gross, M.D. and E. Do, at NSF Workshop on Design Education, Georgia Tech, September 5-8 1997
- Design Computing in Architecture, The Ohio State University, July 2, 1997
- Presentation: Emergence in Sketching - ACM CHI'97 Workshop on Emergence of Concepts and Forms, Atlanta GA, April 1997
- Panelist, on Design and Technology, for FORUM 97, National Conference of American Institute of Architectural Students (AIAS), Hyatt Regency, Denver, November 28, 1997
- 1995 Lecture: The Electronic Drawing Board - Design Studies and Computing Georgia Institute of Technology, College of Architecture, April 20-21, 1997
- Invited Lecture: Architectural Computing Research and Education, University of Edinburgh, Scotland, Feb 5-7, 1995
- 1994 Invited visiting scholar, Nucleus of Informatics and Education, University of Campinas, Brazil. July 1-12

- 1993 Lectures: Advances in sketch recognition, Constraint-based techniques and their applications in design, and Artificial intelligence in architectural design, Georgia Institute of Technology.
- 1992 Lectures: Computing in Architectural Education and Design as Exploring Constraints University of California, Berkeley.
- Project Report: User Interfaces with Intelligent Objects, Colorado Advanced Software Institute, Phipps Mansion, Denver Colorado.
- 1991 Keynote: Constraint Based Design Environments for Architecture and Engineering SOBRACON - Annual Conference, Society for Automation and Numerical Control, São Paulo, Brazil.
- Convocation Speech, Intelligent Machines and Creative Work, Drury College, Springfield Missouri.
- 1990 Lectures: On the Architectural Argument, and Constraint Based Drawing, Georgia Institute of Technology, College of Architecture and College of Computing.

RESEARCH SUPPORT AND AWARDS

- 2009 International workshop on Architectural Robotics, National Science Foundation (with Keith Evan Green, Clemson University), at UbiComp 2009 in Orlando, Florida.
- 2006 Summer Workshops for Software Design Research — National Science Foundation (with M. Shaw, J. Herbsleb, S. Finger): \$130,000 to design, develop, and deliver a model interdisciplinary summer workshop in design research for graduate students.
- 2003 Computationally Enhanced Construction Kits — National Science Foundation (with M. Eisenberg): \$1.8M for 5 years to explore the space of computationally enhanced construction kit toys and digitally produced craft.
- 2001 UrbanSim — National Science Foundation (with A. Borning (PI), co-PIs P. Waddell, D. Notkin, Z. Popovic, B. Friedman): \$3.5M for 5 years to develop and test a system to project impacts of land use and transportation system decisions in an urban context that will enable citizens and decision makers to explore possible design alternatives.
- A Center for Digital Art — University Initiative Fund (with R. Karpen (lead), P. Berger, E. Lazowska, M. Harrison, D. Thome): \$700,000 per year to establish an interdisciplinary center for digital art research and education at the University of Washington.
- 2000 Transforming Architectural Education through Technology — University of Washington, Tools for Transformation grant: \$328,248, to enable students of architecture to employ current computational media and technologies in their architectural studio work.
- 1999 Research Initiation funding for Design Computing Research Laboratory — University of Washington (with E. Do) \$255,508 (3 years) seed funding to establish a laboratory in Architecture Hall for exploration in computational design methods and means.

- 1997 Back of an Envelope an Architecture for Knowledge Based Design Environments — National Science Foundation: \$320,000 (3 years) to explore and demonstrate a recognition based system architecture for freehand drawing as an interface to design application programs.
- 1996/7 Virtual Archaeology at the Ceren Site — University of Colorado President's Changing the Learning Paradigm: (with P. Sheets), \$35,000 (1 year) to develop an interactive and informative virtual environment for learning about an archaeological site in El Salvador, using diverse Web media; continuation funding (additional \$30,000) for 1997/8.
- 1996 PDA based graphical interchange for field service and repair workers — Colorado Advanced Software Institute and USWest Advanced Technologies: (with W. Citrin), \$46,800 (1 year) to develop and demonstrate prototype software for a hand-held networked digital notepad.
- Bringing Learning Activities to Life — National Science Foundation: (with G. Fischer (PI) M. Dubin, E. Arias, T. Neese, A. Repenning): \$50,000 (1 year). Planning grant for a CRLT (Center for Research in Learning Technologies) proposal.
- 1995 A Teaching Toolkit for Technology Enhanced Education — University of Colorado President's Fund for Educational Technology: (with J. Herdt) \$35,000 (1 year) to develop software to support Web based teaching and learning.
- 1993 Avoiding Conflicts in Subsystem Layout in Architectural Design: a constraint based approach — National Science Foundation: \$140,000 (2 years) to demonstrate the application of constraint based CAD to systematizing the layout of building components.
- 1993 Avoiding Conflicts in Subsystem Layout in Architectural Design — University of Colorado at Boulder, Grant in Aid, \$2,450
- 1991 Intelligent Objects in User Interfaces — Colorado Advanced Software Institute: \$30,000 (1 year) to demonstrate a graphics system that employs constraints to embed behavior in interface objects.

Support for undergraduate research assistants

- 1999 University of Colorado Undergraduate Research Opportunities Program: (Support for undergraduate research assistant Mark Ehrhardt, Interactive Visual Educational Environments): \$600.
- 1997 Colorado Advanced Software Institute: Hypersketch II: Creating and Navigating Drawing Relationships-(support for undergraduate research assistant Mike Dalrymple): \$3,000.
- University of Colorado Teaching Award: \$3000, support for undergraduate research assistant Jenniffer Lewin: Information Design Studio.
- University of Colorado Faculty Grants: support for undergraduate research assistant Laura Parker: Multi-user urban design: \$1400.
- University of Colorado Undergraduate Research Opportunities Program: support for undergraduate research assistants (Schwekardt, Dalrymple, Page-Echols, Ehrhardt), 4 mini-grants totaling \$5,000.
- 1996 University of Colorado Undergraduate Research Opportunities Program: support for undergraduate research assistants, 2 mini-grants totaling \$2,000.

Colorado Advanced Software Institute: Drawing as an interface to knowledge based systems (support for undergraduate research assistant Kristin Mayfield): \$3,000.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

European Computer Aided Architectural Design Education (eCAADe)

Association for Computer Assisted Design in Architecture (ACADIA)

Association for Computing Machinery (ACM)

Institute of Electrical and Electronic Engineers (IEEE) Computer Society

EXCERPTS and DESCRIPTIONS OF WORK IN POPULAR PRESS AND BOOKS

WTAE - TV local story on <http://www.thepittsburghchannel.com/video/15411139/index.html>

O'Reilly Radar (April 2008) Simple Blocks to Make Robots

<http://radar.oreilly.com/archives/2008/04/roblocks-simple-blocks-to-make.html>

Center for Interactive Spaces blog: (February 2008) Posey <http://www.digitalexperience.dk/>

The New Scientist online (January 2008) Smart Lego Conjures Up Virtual Twin -

<http://technology.newscientist.com/article/dn13261-smart-lego-conjures-up-virtual-3d-twin.html>

Slashdot (January 2008) slashdot.org/article.pl?sid=08/01/31/1622215 CAAD Talks, ed Mao-Lin Chiu, NCKU (2003)

Pacific Northwest Science and Technology magazine, Next Generation Tools for Architects, Autumn 2002

KUOW 94.6 FM Seattle - Weekday program on Intelligent Buildings, commentator, 7 May 2001

Carillon, University of Colorado at Boulder, 12 March 1999: Code As Art: Bringing Programming to the Masses as a Creativity Tool

Science, NetWatch column, November 20, 1998, the Ceren Virtual Archaeology Site

CADENCE Magazine: January 1999, Digital Clay Project

Rendering Real and Imagined Buildings (book by B.J. Novitski), Van Nostrand Reinhold, 1999, Ceren Virtual Archaeology Site

INVENTION DISCLOSURES

2007 roBlocks: A Robotic Construction Kit for Mathematics and Science Education, Eric Schweikardt and Mark D Gross

2006 A control device for designed for controlling the color and brightness of digitally controlled full spectrum lighting, Jake Pierson, Ellen Do, Mark D Gross

2006 Flow Selection (a time based method of selection in graphical user computer interfaces) Gabe Johnson and Mark D Gross

COURSES TAUGHT

Fall 2007 - Spring 2009 Making Things Interactive

June 2007 co-organizer (with Shaw, Herbsleb, Finger): Design Research Summer School, one-week workshop for PhD students from other universities, to help them formulate dissertation research about design.

Spring 2007 Strategies for Research in Design (with Shaw, Finger, Herbsleb),

Fall 2006, Spring 2007 Architectural Robotics <http://www.architecturalrobotics.org>

Fall 2006 Spring 2007 Digital Fabrication <http://code.arc.cmu.edu/~mdg/DigFab07>

Research Practice: (2003)

day-to-day skills and knowledge needed to do research (writing, bibliography, funding, ethics)

Architectural Design Studio: Mapping the Terrain: (2002)

mixed media and construction; parking garage rehab project for artist drop-city housing.

Architectural Design Studio: Digital Design Build (2001)

Explores the near-term future of architecture, where buildings will embed computational capabilities.

Theory of Design Computing (1999, 2001, 2003)

reviews design research and its applications in computer-aided design.

Design of Virtual Worlds: (1997, 2000, 2002)

Seminar about on-line communities; project work constructing web based places.

Things That Think: (1997, 1998)

Interdisciplinary studio-workshop course on integrating computation in physical artifacts.

Observing Built Form: (1996)

Students observe, document, and discuss the built environment using diverse media.

Introduction to Computing in Design:

Fundamentals of computer applications in architecture.

Making MultiMedia Maps:

Seminar using information technology to make interactive maps.

Three-Dimensional Modeling with Computer Graphics:

Fundamentals of 3D modeling in architecture.

Computer Graphics Programming:

Introduction to design and implementation of computer graphics programs.

The Future of Computer Aided Design:

Seminar considers impacts of information technology in design.

Design Theory and Methods:

Surveys design methods and processes in architectural design.

DOCTORAL DISSERTATION COMMITTEES

Lisa Anthony (Human-Computer Interaction)

Yeonjoo Oh (Computational Design)

Sora Key (Computational Design)

Michael Weller (Computational Design) Architectural Robotics

Eric Schweikardt (Computational Design)

Peter Scupelli (Human-Computer Interaction)

Leah Buechley (Computer Science, University of Colorado) Ph.D. '07
e-textiles

Mamoun Sakkal (pre-comprehensive exam)
Geometry and Computation in Traditional Islamic Architecture
Near and Middle Eastern Studies, University of Washington.

Thomas Wensch Ph.D. '01
Computation and Craft
Computer Science (University of Colorado, Boulder)

Ellen Yi-Luen Do Ph.D. '98
The Right Tool at the Right Time: inferring intention from designers' sketches
Architecture (Georgia Tech)

Judy Gurka Ph.D. '96
Pedagogic Aspects of Algorithm Animation
Computer Science (University of Colorado, Boulder)

Tamara Sumner Ph.D. '96
Toolbelts and Domain Oriented Design Environments
Computer Science (University of Colorado, Boulder)

David Theobald Ph.D. '95
Morphology and Effects of Mountain Land Use Change in Colorado
Geography (University of Colorado, Boulder)

Pei-Yu Huang Ph.D. '94
An Object Oriented Environment for Computer Aided Design
Civil Engineering (University of Colorado, Boulder)

Jeffrey McWhirter Ph.D. '94
Characterization, Specification, and Generation of Visual Language Applications
Computer Science (University of Colorado, Boulder)

Nick Wilde Ph.D. '94
Design of Visual Programming Environments
Computer Science (University of Colorado, Boulder)

Roland Hübscher Ph.D. '94
Imposing Structure on Action: A Framework for Visual Advice-Based Programming
Computer Science (University of Colorado, Boulder)

Alex Repenning Ph.D. '94

*AgentSheets: From General Purpose Visual Programming Environments
to Domain Tailorable Spatial Reasoning Substrates*
Computer Science (University of Colorado, Boulder)

Kumiyo Nakakoji Ph.D. '93
Delivering Case Based Information in Integrated, Knowledge-based Design Environments
Computer Science (University of Colorado, Boulder)

Gerry Stahl Ph.D. '93
Supporting Interpretation in Design
Computer Science (University of Colorado, Boulder)

Andreas Girgensohn Ph.D. '92
End User Modifiability in Knowledge-Based Design Environments
Computer Science (University of Colorado, Boulder)

MASTER THESIS COMMITTEES

Yeonjoo Oh Master of Science, Design Computing, (June, 2004)
Design Evaluator: critiquing freehand sketches

ChenJe Huang Master of Science, Design Computing, (June, 2004)
Tangible MouseHaus Table: an physical interface for collaborative design

Markus Eng Master of Architecture, (June 2004)
FlexM: a computationally enhanced geometric construction kit

Doo Young Kwon Master of Science, Design Computing, December 2003
ArchiDNA – A Generative System for Shape Configurations

Michael Philetus Weller Master of Architecture, June 2003
Espresso Blocks: self-configuring building blocks

Preechaya Therakomen Master of Architecture, December 2001 (chair)
Mouse.class: Pedestrian Behavior in Urban Places

Dustin Eggink Master of Architecture, December 2001 (chair)
Smart Objects

Ming Chun Lee Master of Architecture, December 2001 (member)
The SpaceMaker - A Symbol-based Three-dimensional Computer Modeling Tool for Early Schematic Development of the Architectural Design

Rob Harris Master of Landscape Architecture, August 2001 (member)
Digital Sandbox

William Washington Master of Technical Communication, June 2001 (member)
Affective Media

Kenneth Camarata Master of Architecture, June 2001 (member)
Navigational Blocks: an interplay between the physical and the virtual

- Doddy Samiaji Master of Architecture, June 2001 (chair)
Development Simulator
- Luis F. Borrero Master of Architecture, June 2001 (chair)
DeliverEroom: A new physical space for the residential units to come
- Mathew L. Albores Master of Architecture, June 2001 (chair)
Y2K~02000: A Clock/Library for the Deep Future
- Misun Chung Master of Architecture, June 2000 (chair)
A Sacred Place in CyberSpace
- Dongqiu Qian Master of Design Studies, Design Computing, June 1999 (chair)
(University of Colorado)
A Lightweight Java-based Computer Aided Design Toolbox
- Nabeel Koshak Master of Architecture, June 1997 (chair)
(University of Colorado)
Strategies for Constructing CAD Models of the Historic Buildings in the City of Makkah
- Paul J. Hamill III Master of Electrical and Computer Engineering, June 1998
(University of Colorado)
Internet Structure Visualizations

ADVISORY AND EDITORIAL BOARDS AND PROGRAM COMMITTEES

- 2009 Program Chair: ACM Creativity and Cognition
Associate Chair: ACM Interaction Design and Children
- 2007 ACM Creativity and Cognition Conference
- 2004, 2006 Intl Design Computing and Cognition Conference
- 2006 Research in Engineering Design
- 2002 Editorial board, *CoDesign Journal*
- 2001 Advisory Board, Carnegie Mellon University, Department of Architecture
- Program Committee, Diagrams 2002, 2nd Int'l Conf.Theory & Applications of Diagrams.
- Program Committee, IEEE Symposium on End User Programming
- Program Committee, Spatial and Visual Reasoning II
- 2000 Advisory Board, 6th Int'l Conference on Artificial Intelligence in Design
- 1999 Program Committee, Diagrams 2000: First International Conference on Theory and Application of Diagrams
- 1998 Program Committee, International Round Table Conference Computational Models of Creative Design
- 1997- Editorial Board, International Journal of Design Computing
- 1995-1997 Steering Committee, Association for Computer Aided Design in Architecture

- 1991-1997 Advisory Board, International Conference on Artificial Intelligence in Design
- 1996 Advisory Board, Formal Aspects of Collaborative CAD '97
- 1995 Advisory Board, Computational Models of Creative Design '95
- 1992-1994 Advisory Board, Congresso Internacional de Computação Grafica
- 1992 co-chair (with Ernesto G. Arias), EDRA (Environmental Design Research Association) National Conference, Boulder, Colorado
- 1991- Advisory Board, CADLine—Bibliographic Reference Source for CAD
- 1991- Advisory Board, The Children's Media NeoMuseum, Yoshino, Japan

REFEREE OF MANUSCRIPTS, MATERIALS, AND GRANT PROPOSALS

- 2007 ACM Creativity & Cognition (C&C), ACM User Interface Software Technology (UIST), ACM Human Factors in Computing (CHI), ACM Visual Languages and Human-Centric Computing (VL-HCC) , Eurographics workshop on Sketch Based Interaction and Modeling, ACM Tangible and Embedded Interaction (TEI), Computer Aided Architectural Design Futures (CAAD Futures), Computer Aided Architectural Design and Research in Asia (CAADRIA), Journal of Engineering Design, National Science Foundation proposal reviews (CISE), tenure and promotion reviews (various schools)
- 2006 ACM User Interface Software Technology (UIST), ACM Human Factors in Computing (CHI), ACM Visual Languages and Human-Centric Computing (VL-HCC) , Eurographics workshop on Sketch Based Interaction and Modeling, ACM Tangible and Embedded Interaction (TEI), Design Computing and Cognition (DCC), Computer Aided Architectural Design and Research in Asia (CAADRIA), International Conference on Multimodal Interaction, Open House International, Journal of Engineering Design, HCI Journal, IEEE Computer Graphics and Applications, Artificial Intelligence in Engineering Design and Manufacturing (AI-EDAM), tenure and promotion reviews (various schools), program review Herbst Center for the Humanities in Engineering (U. Colorado), MIT Press
- 2005 Children & Youth Environments (journal), ACM Human Factors in Computing (CHI), Design Decision Support Systems (DDSS), ACM User Interface Software Technology (UIST), Artificial Intelligence in Engineering Design and Manufacturing (AI-EDAM), Interacting with Computers, Eurographics workshop Sketch Based Modeling, ACM Visual Languages and Human-Centric Computing (VL-HCC), IEEE Transactions on Multimedia, CoDesign Journal, Automation in Construction, J. Computing and Information Science in Engineering.
- 2004 SIGGraph, eCAADe, Building Futures Conference, CoDesign Journal, Artificial Intelligence in Engineering Design and Manufacturing (AI-EDAM)
- 2003 CMU Conf. on Generative Computer Aided Design Systems (G-CAD), Int'l Conf. Design Computation and Cognition (DCC), Int'l Journal Document Analysis and Recognition (IJ DAR), Int'l Conf. Design Decision Support Systems '04, ACM Conf.

- User Interface Software Technology (UIST) , 2nd International Workshop on Computer Graphics and Geometric Modeling, CGGM'2003, INTERACT '03, ACM Workshop on Interactive 3D
ACM SIGGraph '03, Education in Computer Aided Architectural Design in Europe '03
Diagrams Journal, MIT Press
- 2002 ACM conference on Interactive 3-D (I3D)
Research in Engineering Design Journal
First European Workshop on Diagrammatics and Design
Design Knowledge Sharing through Internet Application
ACM SIGGraph 2002,
University of Sydney doctoral dissertation (external review)
- 2001 Second International Conference on the Theory and Applications of Diagrams
International Conference on Artificial Intelligence in Design (AID '02)
Computer Aided Architectural Design Research in Asia (CAADRIA '02)
ACM Transactions on Internet Technology (ToIT)
Computational Models of Creativity Symposium
Computer Supported Cooperative Learning (CSCL) Conference
ACM User Interface Software and Technology (UIST) Conference
Human-Centered Computing Conference
INTERACT '01 conference
Education in Computer Aided Architectural Design in Europe (eCAADe)
International Conference on Spatial & Visual Reasoning II
Association for Computer Aided Design in Architecture (ACADIA)
Automation in Construction Journal
Computer Aided Design Journal
MIT Press
Tenure and promotion review, University of California, Los Angeles
- 2000 Computer Aided Architectural Design Futures 2001
American Society of Mechanical Engineers Design Theory & Methodology Conference
Landscape Journal
International Conference on Theory and Applications of Diagrams 2000
Co-Designing 2000
Association for Computer Aided Design in Architecture (ACADIA)
Computer Aided Architectural Design Research in Asia (CAADRIA)
Automation in Construction Journal
Computer Aided Design Journal
The University of California MICRO Grants Program
Canadian Fund for Innovation (FCAR)
- 1999 Education in Computer Aided Architectural Design in Europe (eCAADe)
International Conference on Artificial Intelligence in Design (AID)
Design Computing Network (DCNet) conference
Association of Collegiate Schools of Architecture (ACSA) National Conference
ACM Symposium on Applied Computing (SAC)
Computer Aided Architectural Design and Research in Asia (CAADRIA) '99
International Conference on Visual and Spatial Reasoning '99
Computer Aided Architectural Design Futures '99
Tenure and promotion review, UC Berkeley
Tenure and promotion review, Carnegie Mellon University

- 1998 ACM User Interface Software Tools (UIST) Conference
Transactions on Computer Human Interface (ToCHI)
2nd Int'l Conference on Added Value of Computer Aided Architectural Design
(AVOCAAD)
Association for Computer Aided Design in Architecture (ACADIA) Conference
International Conference on Artificial Intelligence in Design (AID)
Encyclopedia of Creativity
Int. Journal Design Computing (IJDC)
NSF Small Business Innovative Research (SBIR) panel
Tenure and/or promotion review, University of Virginia
- 1997 Association for Computer Aided Design in Architecture (ACADIA) Conference
International Conference on Artificial Intelligence in Design (AID) Conference
Automation in Construction Journal
Int'l J. Human-Computer Systems
Creativity Research Journal
J. Visual Languages and Computing
Van Nostrand Reinhold publishers
NSF Information, Robotics, and Interactive Systems (IRIS)
- 1996 Association for Computer Aided Design in Architecture (ACADIA) Conference
International Conference on Concurrent Engineering
Knowledge Based Systems Journal
Hong Kong Papers on the Built Environment
J. Artificial Intelligence in Engineering Design & Manufacturing (AI EDAM)
- 1995 International Federation of Information Processing WG 5.2 conference on CAD
IEEE Computer, special issue on visual languages
Journal of Visual Languages and Computing
- 1994 MIT Press (Bradford Books)
Society for Applied Computing (SAC) National Conference AI track
Computer Aided Design Journal (special issue on artificial intelligence)
Journal of Concurrent Engineering Research Association
- 1993 Computer Aided Architectural Design Futures '93

SERVICE TO THE DEPARTMENT, COLLEGE, AND UNIVERSITY

Carnegie Mellon University

School of Architecture (Spring 2007-present) Computing Task Force

School of Architecture (Fall 2007, present) director, Graduate Program

University of Washington (1999-2004)

Architecture Department: Studio Computing Integration Committee (2003/4)

College of Architecture and Urban Planning: PhD Program Steering Committee; College Council (2003/4)

Department of Civil Engineering, Search Committee (2002/3)

Provost's Advisory Committee on UIF-3 proposals, January - June 2001

Member of a faculty and staff committee reviewing 27 pre-proposals and 8 proposals for University Initiative Funding, approximately \$3.5M of permanent funding for innovative academic and administrative ventures.

Graduate School Representative on Doctoral Committees

Marsha Lynn Whitney, Bioengineering
Jr-Yi Shen, Mechanical Engineering

College Computing Committee September 1999 - June 2000

Faculty advisory committee to the Associate Dean for Research + Computing on computing resource planning and management.

College Doctoral Program Proposal Committee 2002

Faculty advisory committee to develop and propose doctoral committee for the College of Architecture and Urban Planning.

Department of Landscape Architecture

Search Committee (2 positions) January - June 2001

Reviewed applications and participated in 7 faculty visits for 2 faculty hires in Landscape Architecture.

Department of Architecture

Master of Science in Design Computing implementation committee 2001 - 2002

Administrative and academic preparation for initial class of MS students; negotiating budgets, hiring staff, writing program literature.

Committee on Tenure, Promotion, Merit, Retention – Sept. 1999 - June 2001

Faculty tenure and promotion reviews, review of faculty yearly activity reports and CVs for recommendation to the Chair for merit raises .

Computing Committee - September 1999 - June 2001

Committee advises Department Chair on computing resources management and planning.

Professional Advisory Committee (IT subcommittee) Sept. 2000 - June 2001

Co-author, proposal to establish a Master of Science in Architecture (design computing), submitted November 1999, approved July 2001.

Co-author, Design Education for the Future, a Tools for Transformation proposal (granted May, 2000).

University of Colorado (1990-1999)

University Instructional Computing Working Group, 1994-1999

University committee to oversee instructional computing across the Boulder campus, allocate student technology fee funds.

University Advanced Technology, Learning, And Society (ATLAS) Committee

Advise Associate Vice President for Technology on development of Advanced Technology,

Learning, And Society (ATLAS) program. Subcommittee on Technology, Arts, & Media (1998-1999)

Boulder Faculty Assembly (1992-3)

Representative for the College of Environmental Design

College of Architecture and Planning (1992-99); College of Environmental Design (1990-92)

Faculty advisor, National Organization of Minority Architecture Students (NOMAS) - 1997-99. Assisted students in setting up brown bag lunch series. Helped students organize 1-day workshop on Architects for the Twenty-first Century: Race, Class, and Culture March 13, 1999. Workshop included distinguished panelists from architecture, law, ethnic studies, and women studies.

Computer Committee 1990-1999

Developed computing resources for the 600 students and associated faculty members in the College of Architecture and Planning at the Boulder campus; supervised support and teaching staff, developed curriculum, and through university proposals secured funding for instructional computing resources (approximately \$50,000 annually); planned the development of student 'plug-and-play' studio desktop Internet access.

Department of Planning and Design:

Author, Proposal for a Master of Science in Design Computing (approved April 1998).

Search Committee (1996)

Design Studio Head, Undergraduate Program; Search resulted in several ranked candidates, finalist hired as Associate Professor with tenure. (Architecture)

Search Committee (1994)

Assistant / Associate Professor Architecture, and Assistant / Associate Professor Planning (2 positions). Two candidates selected; one offer made and the candidate hired (Planning).

Search Committee (1992)

Assistant Professor, architectural design (search resulted in an offer, which was declined).

Task force on a Ph.D. in Design and Planning

Member of 3-person team drafting a Ph.D. program proposal (approved, July 1997).