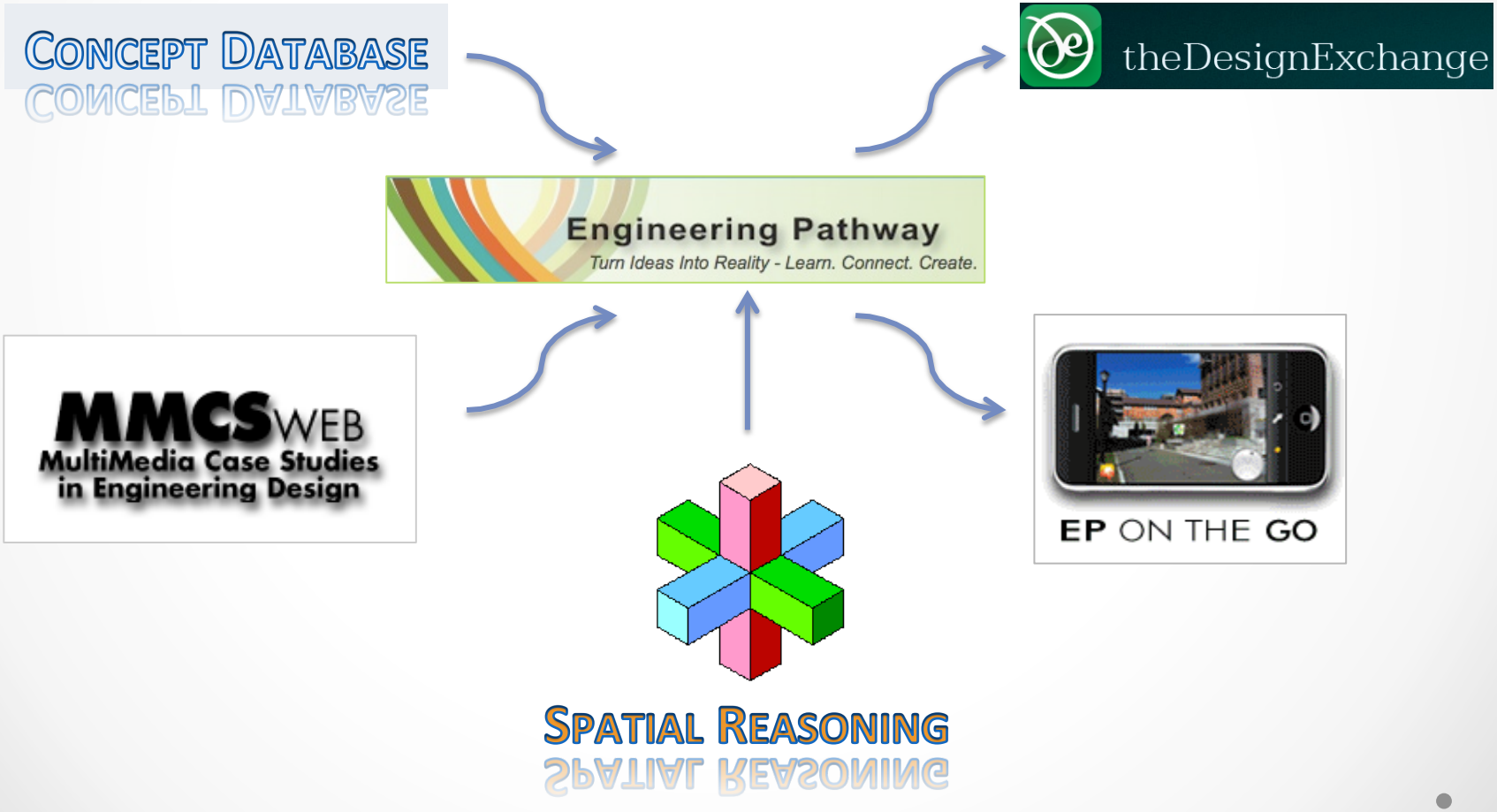
Design Portfolio

Alice M. Agogino



Concept Database

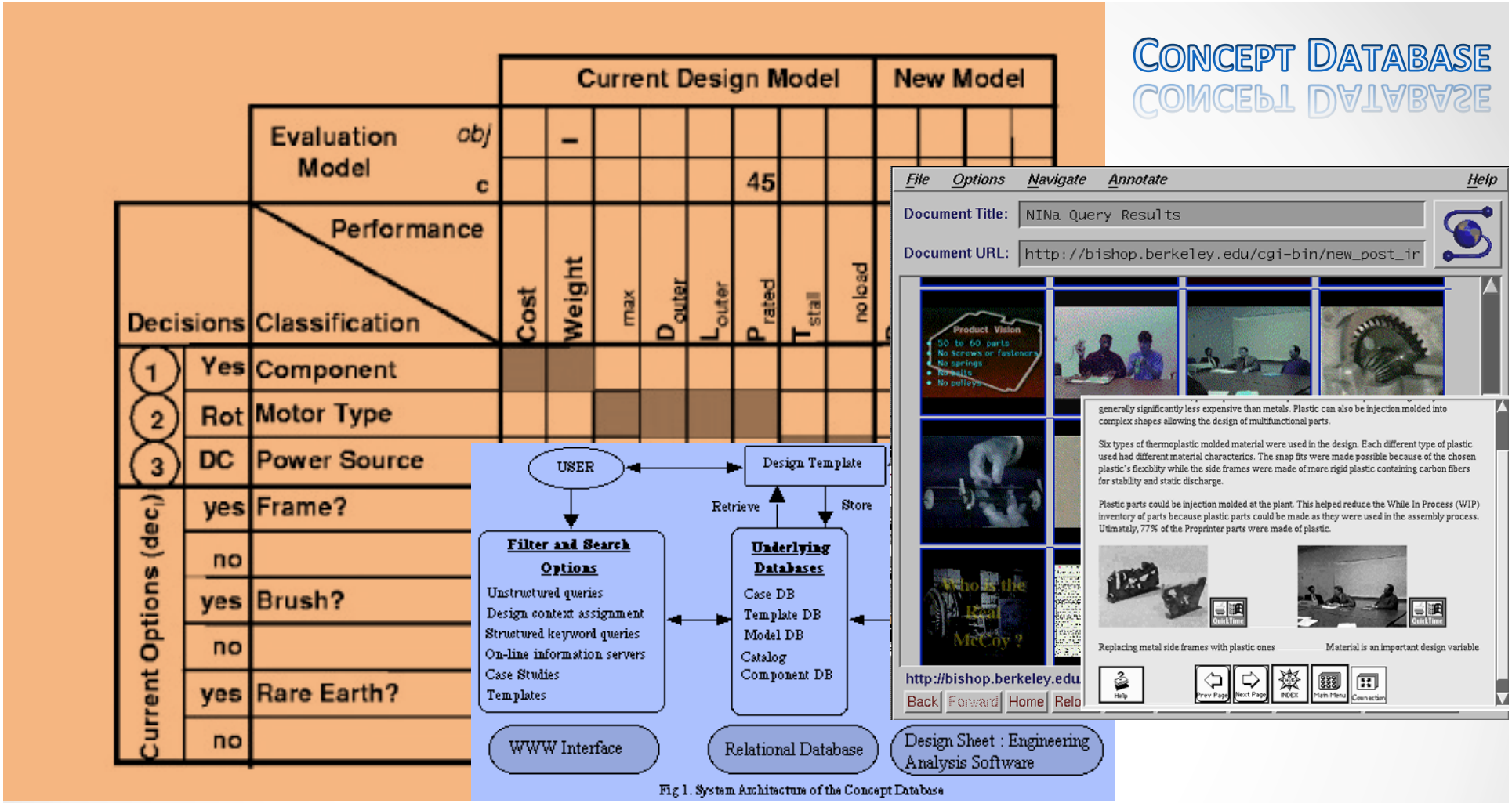


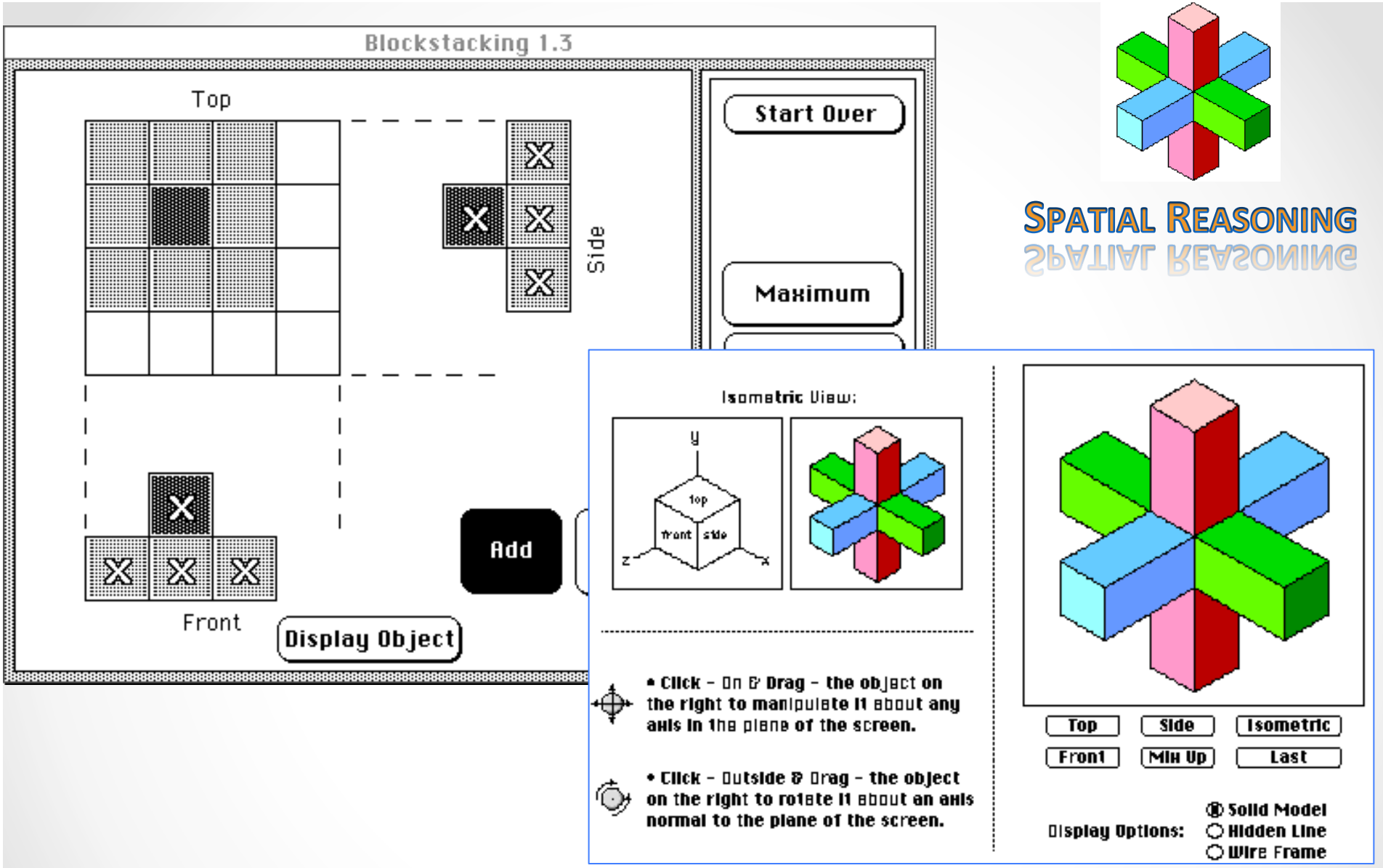
Fig 1. System Architecture of the Concept Database

My early work in the Concept Database using mass customization became the "patent buster" for data-base driven internet commerce as my prior work broke the existing patent in this area. So thank me and my students for why you don't have to pay a license for selling something on the web that is configured through a data base. The interface is a bit ugly though, using X-Windows as this pre-dated the WWW.

Publications

CONCEPT DATABASE

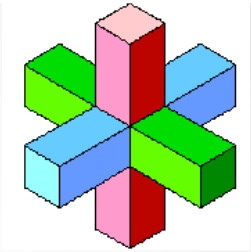
- Bradley, S.R., A.M. Agogino, W.H. Wood III, “Intelligent Engineering Component Catalogs,” in *AI in Design’94*, (Eds., J.S. Gero and Fay Sudweeks), Kluwer Academic Publishing, pp 641-658.
- Agogino, A.M., W.H. Wood, A. Varma, B. Chidambaram, Z. Huang, "Concept Database: A Design Information System for Concurrent Engineering with Application to Mechatronics Design," *Proceedings of the 1995 NSF Design and Manufacturing Grantees Conference*, SME, 1995, pp. 1-2.
- Wood, W.H. and A.M. Agogino, “A Case-based Conceptual Design Information Server for Concurrent Engineering,” CAD *(Computer-Aided Design) Journal*, Elsevier Science Ltd, Vol. 28, No. 5, pp. 361-369, 1996 .
- Agogino, A.M. and W.H. Wood, "Conceptual Design Database To Support Life Cycle Design Of Mechatronic Products: Integrating Design Tools From Industry," Final Report 1993-94 for MICRO Project 93-003, 1996, pp. 13-16.
- Agogino, A.M., “The Concept Database: A Design Information System for Concurrent Engineering with Application to Mechatronics Design,” Final Report to NSF Grant No. DDM-9300025, 1998.
- Chidambaram, Bala and Alice M. Agogino, "Catalog-Based Customization", to *Proceedings of the 1999 ASME Design Automation Conference, 1999*



Spatial Reasoning

I co-developed spatial reasoning software using a natural environment for engineering graphics students to improve their spatial reasoning and 3D visualization skills.

Publications



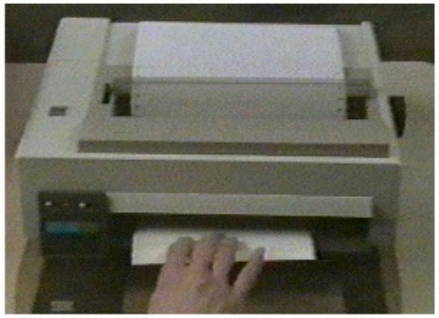
SPATIAL REASONING

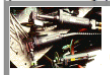
- "An Interface for Interactive Spatial Reasoning and Visualization", (with J.R. Osborn), *Proc. Of CHI '92* (Conference on Human Factors in Computing Systems, 1992, pp. 75-82.
- Blockstacking Courseware (with S. His and M.C. Linn), 1973.
- "Learning Style Based Innovations to Improve Retention of Female Engineering Students in the Synthesis Coalition" (with S. Hsi), *Engineering Education for the 21st Century: Proceedings of Frontiers in Education*, FIE'95, ASEE/IEEE, pp. 4a2.1-4a2.4, 1995. This paper describes the use of integrative multimedia courseware designed to scaffold student learning and accommodate learning style differences. Synthesis courseware aimed at improving the retention of under-represented engineers has been further designed to work effectively in a range of educational settings, including classroom, high-tech small study groups and self-paced individualized learning. As an example, this paper focuses on the Spatial Reasoning project aimed at improving the retention of female engineering students through scaffolding students in spatial reasoning.

The IBM Proprinter

A Case Study in Engineering Design

MMCSWEB
MultiMedia Case Studies in Engineering Design





Cyclone Grinder

About This Case Study

This case study highlights the importance of good design practices and how they contribute to product success. The Cyclone Grinder's success in the market can be attributed to the significant changes Ingersoll-Rand (IR) made in their new product develop ment process.

Quality plays a major role in this product devel
will be presented:

- Customer Focus
- Industrial Design
- Ergonomic Design
- Compressed Development Cycle
- Multifunctional Teams
- Concurrent Engineering

The Mattel Color Spin

A Case Study in Design

SYNTHESIS National Engineering Education Coalition:
Cal Poly San Luis Obispo, Cornell, Hampton, Iowa State, Southern, Stanford, Tuskegee, Univ. of California: Berkeley.

Working with my graduate students, I developed multimedia cases of engineering design, including industrial design, design for assembly, design for manufacture, customer-driven design, design trade-offs, design for environment service & ergonomics, social implications of design, history of technology.

The 1991 Human Powered Vehicle

MMCSWEB
MultiMedia Case Studies in Engineering Design

The multimedia cases were used for K-12 outreach, as well as introduction to engineering, freshman design and senior design classes.

The Virtual Disk Drive Design Studio is an educational game using interactive multimedia to introduce students to the world of mechatronics design. It won the Premier Award for Excellence in Engineering Courseware in 1997.

Publications

MMCSWEB
MultiMedia Case Studies in Engineering Design

- "The Impact and Instructional Benefit of Using Multimedia Case Studies to Teach Engineering Design" (with S. Hsi), *Journal of Educational Hypermedia and Multimedi*a, Association for the Advancement of Computing in Education, Vol. 3 (3/4), 1994, pp. 351-376.
- "Scaffolding Knowledge Integration through Designing Multimedia Case Studies of Engineering Design," *Engineering Education for the 21st Century: Proceedings of Frontiers in Education*, FIE'95, (with S. Hsi), ASEE/IEEE (ISBN 0-7803-3022-6), pp. 4d1.1-4d1.4.
- People, Product and Process: Interactive Multimedia Case Study in Integrated Design and Manufacturing Strategies," (with D. Johnston and R. Stanard), *Engineering Education for the 21st Century,* FIE'95, ASEE/IEEE, pp. 3a2.22-3a2.26.
- "Examples of Freshman Design Education" (with Sheppard, S., R. Jenison, M. Bereton, L. Bucciarelli, J. Dally, J. Demel, C. Dym, D. Evans, R. Faste, M. Henderson, P. Minderman, J. Mitchell, A. Oladipupo, M. Picket-May, R. Quinn, T. Reagan, and J. Wujek), Int. *Journal on Engineering Education,* vol. 13, no. 4. pp. 248-261, 1997.
- Virtual Disk Drive Design Game with Links to Math, Physics and Dissection Activities," (with Rebecca Richkus, David Yu, and David Tang), *Proceedings of FIE'99 1999*, pp. 12c3-18 to 12c3-22.

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We are developing applications that enable users to navigate through and access location-based digital library resources with mobile browsers or augmented reality tools. We are also designing web-based tools for teachers and students to create, review, and explore collections of these resources. See the EP on the GO collection at www.engineeringpathway.org/collections/epgo/

Engineering Pathway

Turn Ideas Into Reality - Learn. Connect. Create.

Grade/Audience: All

Keywords: GO

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Mobile Learning — Engineering Education Community

Learning that is enabled across locations and takes advantage of learning opportunities offered by portable technologies.

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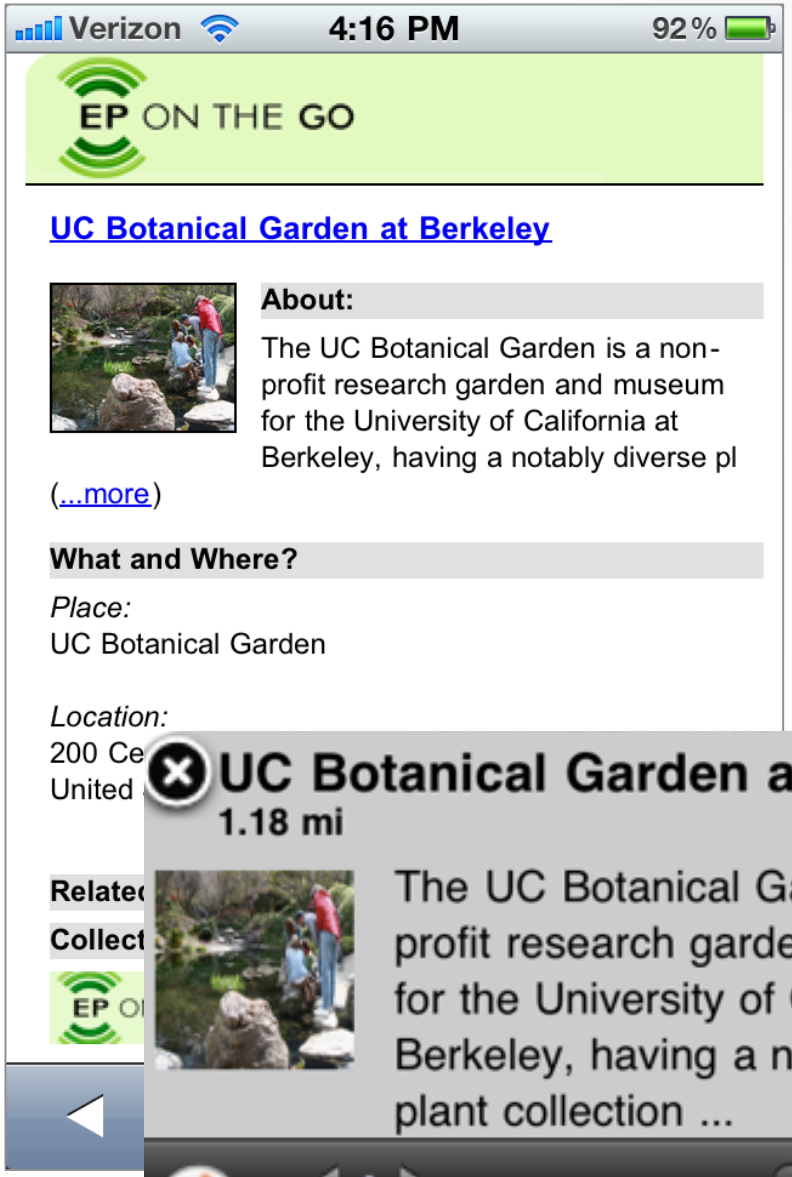
Mobile Learning with Augmented Reality



Publications

- "Designing an Untethered Educational Digital Library", (with A.Dong), *Proc. of the IEEE International Workshop on Wireless and Mobile Technologies in Education, 2003.*
- "Informal Health and Legal Rights Education in Rural, Agricultural Communities Using Mobile Devices", (with J. Sandhu, J. Hey, and C. Newman), *Proc. of IEEE Technology for Education in Developing Countries*, 2005.
- "Designing Mobile Digital Library Services for Pre-Engineering and Technology Literacy," (with J.H. Hey, , J. Sandhu, C. Newman, J.-S. Hsu, , C. Daniels, E. Datta), *International Journal of Engineering Education*, Special Issue on Mobile Technologies for Engineering Education, Vol. 23 (3), pp. 441-453, 2007.
- "Mobile Learning and Digital Libraries: Designing for Diversity", (with E. Datta), *Proceedings of the ASME Congress*, 2007 (ISBN 0-7918-3812-9)
- "Green Hat: Exploring the Natural Environment Through Experts Perspectives", (with K. Ryokai, L. Oehlberg), *Proc. of ACM CHI 2011.*
- "Off the Paved Paths: Exploring Nature with a Mobile Augmented Reality Learning Tool" (with K. Ryokai), *Journal of Mobile HCI ,Vol. 5 (2), pp. 21-49, 2013.*

theDesignExchange

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Help create the most extensive web resource for the design community.

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Analysis
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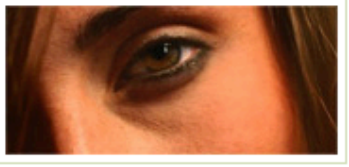
welcome!

we hope you'll join us



Welcome to the DesignExchange, an interactive portal for the human-centered design community! Methods based on academic and industry publications will slowly be added by the students working on the site. Then, it will be opened up to new members, who will be able to add, edit, rate and comment on methods, new or old. Members will also be able to add case studies about their design research so we can all learn from each others' experiences!

featured method

featured case study

Publications

- "The Design Exchange: Supporting the Design Community of Practice," (with C. Roschuni and S. Beckman), *Proceedings of ICED 2011 Proceedings of the 18th International Conference on Engineering Design (ICED11)*, Vol. 8, 2011, pp. 255-264. The study of design – and more specifically, the quality of the process of design – has been shown to have high impact and leverage on the quality and success of engineered products. As design research does not fall into any one disciplinary body of knowledge, there is a need to consolidate and organize the many design research methods used, develop a community of practitioners to evaluate and categorize those methods and educate the next generation of design innovators in appropriate methods. In this paper, we introduce a preliminary design for The DesignExchange , an interactive web portal to meet these needs.

- Annual Report, "EAGER: TheDesignExchange: Characterizing, Mapping and Interacting with Industry on User-Focused Design Methods," NSF, June 2013.