Andy Dong, Ph.D.

PRINCIPAL RESEARCH AREAS

Design theory, practice, and management.

EDUCATION

1997 **University of California at Berkeley**
College of Engineering
Ph.D. in Mechanical Engineering
Dissertation: The Management of Design Information: A Decision-Analytic Approach
Advisor: Professor Alice M. Agogino

1995 **University of California at Berkeley**
Department of Mechanical Engineering
Master of Science in Mechanical Engineering

1992 **University of California at Berkeley**
Department of Mechanical Engineering
Bachelor of Science in Mechanical Engineering with High Honors

ACADEMIC EXPERIENCE

2017 – *Professor and Chair of the MBA in Design Strategy*
California College of the Arts

2017 – *Adjunct Professor*
UC Berkeley, Department of Mechanical Engineering

2012 – *Professor and Warren Centre Chair for Engineering Innovation*
University of Sydney, Faculty of Engineering & Information Technologies

2012 – 15 *Australian Research Council Future Fellow*
University of Sydney, Faculty of Engineering & Information Technologies

2010 – 12 *Associate Professor*
University of Sydney, Faculty of Architecture, Design and Planning

2006 – 09 *Senior Lecturer*
University of Sydney, Faculty of Architecture, Design and Planning

2003 – 05 *Lecturer*
University of Sydney, Faculty of Architecture, Design and Planning

UNIVERSITY OF SYDNEY LEADERSHIP AND MANAGEMENT

2014 – **Engineering and Technology Precinct Transformation Program Academic Lead,** Faculty of Engineering and Information Technologies

2013 – 15 **Director of Teaching and Learning,** School of Civil Engineering, Faculty of Engineering and Information Technologies

2011 – 12 **Member**, Divisional Board, Division of Architecture and the Creative Arts

2010 – 12 **Head of Discipline**, Design Lab, Faculty of Architecture, Design and Planning
Member, Faculty Executive Group, Education Committee, and Research Committee, Faculty of Architecture, Design and Planning
Co-Opted Member, Academic Standards and Policy Committee, Academic Board

2010 – 11 **Member**, Academic Workload Monitoring Committee

2009 – 10 **Acting Head of Discipline**, Design Lab, Faculty of Architecture, Design and Planning

2006 – 10 **Bachelor of Design Computing Program Director**, Faculty of Architecture, Design and Planning

2006 – 08 **Member**, Academic Board

2006 – 07 **Member**, ICT in Teaching & Learning Working Group

2004 – 06 **Postgraduate Design Computing Program Director**, Faculty of Architecture, Design and Planning

INVITED ACADEMIC APPOINTMENTS (FULLY FUNDED)

2008 Visiting Researcher, Japan Advanced Institute of Science and Technology

2008 Visiting Researcher, Innovative Design and Manufacturing Research Centre, Department of Mechanical Engineering, University of Bath, UK

AWARDS AND DISTINCTIONS

2010 Australian Research Council Future Fellow
(http://www.arc.gov.au/ncgp/futurefel/future_default.htm)

2005 Design Studies Award in 2005 for the best paper published in the journal *Design Studies*. £500.

1996 Best Paper, Artificial Intelligence in Design '96.

RESEARCH GRANTS (EXTERNAL COMPETITIVE)

2016 – 19 **Enabling the Design of Failure-Tolerant Complex Engineered Systems using New Network-Based Modeling, Analysis, and Simulation Formalisms**
National Science Foundation
Division of Civil, Mechanical, and Manufacturing Innovation, Award No. 1562027, $466430.
Co-PI with Irem Tumer (Oregon State University)
Introduces a new approach to robust design based on failure tolerance of interdependent networks.

2016 – 18 **The logic of market-creating innovations**
Australian Research Council
Discovery Projects, DP160102290, AU$288,000
Lead CI with Massimo Garbuio and Dan Lovallo
Provides theoretical insights and empirical evidence on behavioural determinants of companies and executives that lead to market-creating growth.

2013 – 15 **Behavioural Strategies for Selecting Innovation Projects**
Australian Research Council
Discovery Projects, DP130101065, AU$333,483
Co-CI with Dan Lovallo
Integrates insights from design thinking and economic theory to understand how a design perspective can inform decision making under uncertainty.

2010 – 14 **Inventiveness and the Progress of Product Innovation**
Australian Research Council
Future Fellowship, FT100100376, AU$669,952
Investigates quantitative models of inventiveness to forecast the potential rate of improvement of a technology.

2010 – 12 **The mathematics and language of engineering uncertainty, preference and utility**
Australian Research Council
Discovery Projects, DP1095601, AU$180,000
Co-CI with Maria Yang
Formed mathematical models of uncertainty, preference and utility based upon how people speak about what they prefer and what they choose.

2009 – 12 **Linguistics-based preference information modeling for design decision-making**
National Science Foundation
Division of Civil, Mechanical, and Manufacturing Innovation, Award No. 0900255, US$319,999.
Co-PI with Maria Yang (MIT)
Modeled the preference information embedded in natural language engineering design texts as description of decision-making.

2007 – 08 **Understanding the information content of emails for improved information management and collaboration in large engineering projects**
UK Engineering and Physical Sciences Research Council
GR/R67507/01, £71,214
Co-CI with Ben J Hicks and Linda Newnes (University of Bath)
Studied how a large UK engineering design firm uses e-mail to manage design projects.

2007 – 10 **A study of the potential for the public to be involved in the design of large scale public works**
Australian Research Council
Discovery Projects, DP0772252, AU$282,935
Co-CI with Tom Kvan
Created instrument to inform public policy to negotiate and understand arrangements that balance social participation with Government objectives.

2005 – 08 **Designing for mobile learning in a technology museum**
Australian Research Council
Linkage Projects, LP0562267, AU$144,888
Co-CI with Peter Reimann; Industry Collaborator: The Powerhouse Museum
Developed a pedagogical model of informal learning supported by a mobile learning and 'collaboratory' technical infrastructure.

2005 – 07 **Computational methods for the social accounting of teamwork**
Australian Research Council
Discovery Projects, DP0557346, AU$150,000
Developed automated computational methods to assess the prosocial, group-level integrative behaviour of teamwork.

2005 – 07 **Enabling Team Collaboration with Pervasive and Mobile Computing**
Cooperative Research Centre for Construction Innovation, 2002-057-C, AU$132,700
Co-CI with Stephen Kajewski (Queensland University of Technology) and Mary Lou Maher (University of Sydney); Industry Collaborators: John Holland Group,

Woods-Bagot Architects Pty Ltd., and the CSIRO
Introduced new technology for data collection and analysis/processing at the interface between physical site operations, construction management activities and consultancy practice.

2001 – 04 **Enhancing Interoperability of Collections and Services**
National Science Foundation
DUE-0127580, US$1,000,000
Co-PI with Alice Agogino (PI) (University of California, Berkeley)
Enhanced the interoperability of collections and services for the National Science Digital Library.

RESEARCH GRANTS (UNIVERSITY OF SYDNEY INTERNAL COMPETITIVE)

2004 **An investigation of design cognition using computational linguistics**
Sesqui 2004 New Staff Support Scheme, AU$13,000

TEACHING GRANTS (UNIVERSITY OF SYDNEY INTERNAL COMPETITIVE)

2009 **Towards an accreditation framework for the Bachelor of Design Computing**
Teaching Improvement and Equipment Scheme, AU$6,400.

2006 **An Industry Fellows Teaching Program in the Faculty of Architecture**
Teaching Improvement Fund, AU$10,000

2005 **Tangible Input and Output Devices**
Teaching Equipment Fund, AU$20,000

DOCTORAL SUPERVISION (PRINCIPAL)

2014 – Praveena Chandra, *The Knowledge Structures of Innovations and Their Influence on Subsequent Innovations*

2013 – Leonardo Burlamaqui, *Affordances and the Technological Progress of Products and Services*

2007 – 14 Crighton Nichols, *The Adaptation of Technologies by Indigenous Communities: A Capability Approach*. Now Innovation Lead & Enterprise Architect at PwC Australia.

2007 – 11 Fiona Chatteur, *Patterns and Pedagogies: Approaches to Developing E-learning Environments*. Now Instructor at the North Sydney Institute of TAFE.

2006 – 10 Lucila Carvalho, *A Sociology of Informal Learning in/about Design*. Now Postdoctoral Research Associate in the Centre for Research on Computer Supported Learning and Cognition (CoCo) at the University of Sydney.

2005 – 09 Vishal Singh, *Computational Studies on the Role of Social Learning in the Formation of Team Mental Models*. Now Assistant Professor in the Department of Civil and Structural Engineering, School of Engineering, Aalto University, Finland.

2005 – 09 Somwrita Sarkar, *Acquiring Symbolic Design Optimization Problem Reformulation Knowledge: On computable relationships between design syntax and semantics*. Now Lecturer in Design Computing in the Faculty of Architecture, Design and Planning at the University of Sydney.

2005 – 09 Jianxiong Wang, *A Machine Learning System for Understanding Appraisal in Design Documents*. Now Associate Professor in the School of Computer Science & Educational Software, Guangzhou University, Guangzhou, China.

UNDERGRADUATE HONOURS SUPERVISION (PRINCIPAL)

2015 Isobel James and Wenray Wang, *Crumpled Structures*, Hons1

2015 Isaac Beton and Rebecca Tan, *An Empirical Analysis of the Salient Geometric Properties of Crumpled Paper Balls in Compression*, Hons2

2014 Sonia Cunningham and Andrew Kim, *A Design Framework for Deployable Tensegrity Structures*, Hons1

2014 Alexander McGrouther, *A Novel Approach for a Self-Tuning Piezoelectric Wind Energy Harvester*, Hons1

2013 Jane Armstrong and Michelle Watson, *Additive Manufacturing with Wood*, Hons1

2013 Viren Fernando and Jeffrey Quan, *Risk Attitudes in Technological Innovation Project Screening*, Hons1

2013 Troy Freeburn and Paul Mittiga, *A Piezoelectric Wind Energy Harvester for Electrochromic Windows*, Hons1

2013 Samantha Horlyck and Casthuri Kamalaraj, *Intimacy Metric for Structural Design*, Hons1

2006 Melinda Hughes, *Orienteering through Museums: Using learning theories and game characteristics to support collaborative learning*, Hons2

2005 Nora Shaheed, *Using functional grammar to characterise how designers describe design*, Hons2

2004 Daniel Barker, *HADLIR: A Hardware as Agents Description Language for Intelligent Rooms*, Hons1

2004 Carolyn James, *Machine learning of user experiences in intelligent environments through natural language feedback*, Hons1

VISITING SCHOLARS HOSTED

2014 Dr Sebastian Koziolek, G08 Fellow, School of Mechanical Engineering, Wroclaw

University of Technology, Poland

2007 Dr Maria Mencia, Senior Lecturer in Digital Media, Faculty of Arts and Social Sciences, Kingston University London, UK

2007 Dr Quoc-Hy Dao, Lecturer, Department of Geography, University of Geneva

2007 Dr Maaike Kleinsmann, Assistant Professor, Faculty of Industrial Design Engineering, Department of Product Innovation Management, Delft University of Technology, The Netherlands

2006 Dr Ben J Hicks, Senior Research Fellow, Department of Mechanical Engineering, University of Bath, UK

ACADEMIC SERVICE

Community Service (Australia)

2015 National Selection Panel, Westpac Bicentennial Foundation Research Fellowship and Future Leaders Scholarship

2012 – 16 Strategic Advisory Group, Australian Design Centre

2012 Peer Reviewer for the Field of Design, Excellence in Research for Australia 2012.

2010 Panelist for the Field of Design, Journal Ranking Exercise, Excellence in Research for Australia.

International Conference Organization

2013 *25th International Conference on Design Theory and Methodology*. Conference Chair.

2012 *24th International Conference on Design Theory and Methodology*. Program Chair.

2007 *Computer Aided Architectural Design Futures (CAADFutures) 2007*. Local Chair.

2006 *Second International Conference on Design Computing and Cognition (DCC'06)*. Conference Manager.

2004 *First International Conference on Design Computing and Cognition (DCC'04)*. Conference Manager.

Journal Editorial Service

Present **Associate Editor**, *Journal of Mechanical Design* and *International Journal of Design Creativity and Innovation*

Editorial Board, *Artificial Intelligence for Engineering Design, Analysis and Manufacturing, Research in Engineering Design*, and *Journal of Engineering Design*

2012 **Guest Editor** with Dr Julie Jupp, Special Issue of *Artificial Intelligence for Engineering Design, Analysis and Manufacturing* on Intelligent Decision Support and Modeling, **26**(4), November 2012. (Dong, A., & Jupp, J. (2012). Guest Editorial: Intelligent Design Support and Modeling. *Artificial Intelligence Engineering Design Analysis and Manufacturing*, **26**(4), 371-73.)

2007 **Guest Editor**, Special Issue of *Artificial Intelligence for Engineering Design, Analysis and Manufacturing* on Design Computing and Cognition, **21**(4), November 2007. (**Dong, A.**, & Gero, J. S. (2007). Special Issue: Design Computing and Cognition. *Artificial Intelligence Engineering Design Analysis and Manufacturing*, **21**(4), 315-316.)

2005 **Guest Editor**, Special Issue of *Artificial Intelligence for Engineering Design, Analysis and Manufacturing* on Design Computing and Cognition, **19**(4), November 2005. (**Dong, A.** (2005). Guest Editorial Special Issue: Design computing and cognition. *Artificial Intelligence for Engineering Design, Analysis and Manufacturing*, **19**(4), 227-228.)