

CALL FOR PAPERS

AI EDAM Special Issue, November 2010, Vol. 24, No. 4 BIOLOGICALLY INSPIRED DESIGN

Guest Editors: Amaresh Chakrabarti & Li Shu

This Special Issue of *AI EDAM* will be devoted to papers concerned with biologically inspired design.

Natural processes have led to the development of a plethora of biological systems that carry out a multitude of tasks in a highly resource-effective way within a variety of environments and constraints. Many of these tasks, environments, and constraints are similar to those relevant in engineering design. Therefore, biological systems offer a rich, potential source of inspiration for novel and resource-effective engineering designs. History shows ample anecdotal evidence of using these systems as inspiration for engineering. Biologically inspired designs were previously an outcome of individual interest or accidental exposure, but supporting their use in inspiring engineering design is rapidly developing into an area of active research and exploration. This Special Issue is aimed at providing a state-of-the-art collection of research outcomes in this emerging area.

Although papers with normal AI content are desired, for this Special Issue we broaden the scope to include papers that provide knowledge and associated methodology for biologically inspired design. Suitable topics include, but are not limited to, the following:

- models, techniques, or systems, both human-centered and computational, for (supporting) biologically inspired design (including biomimetics/biomimicry/bionics);
- models of reasoning for biologically inspired design; and
- studies of reasoning for biologically inspired design.

All submissions will be anonymously reviewed by at least three expert reviewers. The selection for publication will be made on the basis of these reviews.

Information about the format and style required for *AI EDAM* papers can be found at www.cs.wpi.edu/~aiedam/Instructions/. However, note that all submissions for Special Issues go to the Guest Editors, **not** to the Editor in Chief.

Important Dates

Intent to submit (Title and Abstract):	As soon as possible
Submission deadline for full papers:	15 September 2009
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CALL FOR PAPERS

AI EDAM Special Issue, May 2011, Vol. 25, No. 2 CONFIGURATION

Guest Editors: Alexander Felfernig, Markus Stumptner, & Juha Tiihonen

Configuration can be defined as the composition of a complex product from instances of a set of component types, taking into account restrictions on the compatibility of those component types.

From the viewpoint of product configuration, different artificial intelligence (AI) approaches are well established as central technologies in industrial configuration systems. However, the wide use of configuration technologies and the increasing size and complexity of configuration problems in industry makes the field more challenging than ever. Nowadays, the mass customization paradigm is extended from traditional physical products to the fields of software and service configuration. Traditional configuration systems have evolved into interactive Web-based applications that need to support highly sophisticated preference handling and explanation techniques.

In addition to the configuration of physical products, real-world applications of configuration technologies are also encountered in domains such as computational biology, service composition, design, image analysis, model-driven software engineering, and software product lines. The ever increasing range of real-world applications triggers the demand to extend existing configurator functionalities. A wide range of AI techniques provide major contributions in this context: constraint satisfaction, description logics, logic programming, case-based reasoning, learning, knowledge acquisition, intelligent testing, and different specialized problem solving methods.

As a successful AI application area, configuration has attracted lasting industrial interest and renewed research, as demonstrated by recent workshops on configuration at IJCAI 2009, ECAI 2008, AAI 2007, ECAI 2006, IJCAI 2005, ECAI 2004, IJCAI 2003, ECAI 2002, IJCAI 2001, ECAI 2000, AAI 1999, and the AAI 1996 Fall Symposium.

The goal of this Special Issue on configuration is to demonstrate novel and innovative configuration research as well as new industrial applications of configuration technologies. We encourage submissions describing novel results involving AI in configuration-related areas, which may include, but are not limited to, the following:

- theoretical issues justified by practical concerns;
- methods for computing configurations and supporting configuration tasks;
- methods for effective configuration knowledge base development, testing, and debugging;
- configuration and product and service design, product and service life cycle management, and production management;
- thorough case studies highlighting new practical problems, needs, and experiences; and
- practical and new applications based on a well-defined theory or model.

Articles that survey different approaches and thoroughly analyze their differences and commonalities are also welcome.

Papers will be anonymously reviewed by at least two reviewers. Quality papers not selected for this Special Issue may be considered for standard publication in *AI EDAM*.

Information about the format and style required for *AI EDAM* papers can be found at www.cs.wpi.edu/~aiedam/Instructions/. However, note that all submissions for Special Issues go to the Guest Editors, **not** to the Editor in Chief.

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CALL FOR PAPERS

AI EDAM Special Issue, August 2011, Vol. 25, No. 3 THE ROLE OF GESTURE IN DESIGNING

Guest Editors: Willemien Visser & Mary Lou Maher

Design generally involves teams of designers collaborating on a design project. Although individual participants in a design team may make independent contributions to the project, collaborative design assumes that contributions are based on the interactions among different participants. This interaction occurs through various modalities (semiotic systems): verbal interaction has thus far received the most attention, both in research and in development, but graphical, gestural interaction and other modalities (gaze, posture, prosody) also play important roles. This Special Issue of *AI EDAM* focuses on the role of gesture in designing.

Compared with verbal and graphical interaction, gestural expression has been barely analyzed in studies on collaborative design. Nevertheless, gesture has been shown to be used frequently by designers in their interactions and with varying functions (e.g., specification of design objects, as well as management of interactions).

The analysis of gesture's function in collaborative design has implications for environments that support remote collaborative design. Until now, they mainly supported pen-based pointing or command gestures, but if such environments are to effectively support designers collaborating from remote locations, representational and other types of gestures must also be visible and transmitted to the design partners.

To advance this important topic, we seek papers that provide theoretical or empirical contributions to the role of gesture in designing, either in the context of computer supported collaborative design or as a precursor to designing effective collaborative design environments.

The aim of this Special Issue on the role of gesture in designing is to further discussion at the intersection of theory and practice. Contributions are sought from artificial intelligence (AI), human–computer interaction (HCI), and computer supported collaborative work (CSCW) perspectives as well as cognitive science disciplines, such as psychology and pragmatics. Topics may include, but are not limited to, the following:

- theoretical aspects of gesture in design interaction;
- the role of gestures in design thinking;
- gesture and multimodal interaction in design interaction: gesture with speech, writing, drawing, and other modalities;
- AI and cognitive models of gesture in design interaction;
- the role of gesture and multimodal interaction in remote design collaboration;
- HCI and studies of gesture in collaborative design environments;
- new HCI technologies that enable gesture in design environments;
- gesture and multimodal interaction in CSCW design environments; and
- the role of gestures in defining an external representation of the design model (either to the computer or to a person).

All submissions will be anonymously reviewed by at least three expert reviewers. The selection for publication will be made on the basis of these reviews.

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CALL FOR PAPERS

AI EDAM Special Issue, November 2011, Vol. 25, No. 4 REPRESENTING AND REASONING ABOUT THREE-DIMENSIONAL SPACE

Guest Editors: Sean Hanna & Bill Regli

This Special Issue will survey the range of approaches to representing and reasoning about three-dimensional (3-D) space. We seek practice-based contributions in spatial design domains such as architecture, urban planning, and mechanical design; theoretical contributions, for example, from cognitive modeling; and technical approaches to the representation of space from computer-aided design (CAD)/manufacturing, computer-aided architectural design, and computer-aided engineering. Our intent is to provide common ground across this variety of disciplines and focus the discussion on specific factors that support a wide variety of design and engineering problem domains, so that representations and approaches can be usefully compared.

The way 3-D space is represented and understood is fundamental to all design. In architecture and urban design, space is the product of design. In the engineering of smaller artifacts, it is the context in which their parts relate to one another. In manufacturing, it is the environment in which control systems must operate physical processes.

Papers may address alternative representations of space. The typical Cartesian representation of geometry as symbolic primitives in relation to a single origin is powerful and ubiquitous, but relationships between geometry (of adjacency interior/exterior, convex space) that are clear to designers require significant additional computation. Parametric and topological alternatives, graph-based representations, and distance metrics each play a role across a variety of disciplines from cognitive and perceptual modeling to virtual reality and CAD. Spatial reasoning techniques from artificial intelligence and robotics are also of interest. The choice of representation affects the process of design and should be understood prior to the creation and utilization of intelligent computational applications.

Reasoning about 3-D space may also be the focus of submitted papers. The analysis of space from either a methodological point of view or as used in design is of interest. In this context, “space” also includes work on 3-D representations and reasoning techniques for shape, form, and function. Work that deals with space while avoiding representation in the traditional sense, as in embodied robotics, is welcomed, as is work in which space itself plays a role in reasoning or serves as a means of communication, such as in agent-based models.

Topics may include, but are not limited to, the following:

- AI and cognitive models of 3-D space;
- approaches to perception and action in 3-D space;
- computational methods for spatial analysis;
- computational methods for spatial design (architecture, urban, etc.);
- the role of spatial reasoning in design;
- spatial reasoning in robotics and manufacturing/fabrication control systems;
- alternative representations in CAD and design tools;
- spatial representation as a common language across design disciplines;
- exchange of 3-D spatial data across systems, domains, and time;
- development and use of standards; and
- case studies.

All submissions will be anonymously reviewed by at least three reviewers, and the selection for publication will be made on the basis of these reviews. High quality papers not selected for this Special Issue may be considered for standard publication in *AI EDAM*.

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Index and Contents
for Volume 23, 2009



EDITOR

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- Abiyev, Rahib H., *Fuzzy Wavelet Neural Network for Prediction of Electricity Consumption*, 109
- Agogino, Alice, see Oehlberg, Lora, 237
- Ahmed, Saeema and Mario Štorga. *Merged Ontology for Engineering Design: Contrasting Empirical and Theoretical Approaches to Develop Engineering Ontologies*, 391
- Al-Refaie, Abbas, Tai-Hsi Wu, and Ming-Hsien Li. *Data Envelopment Analysis Approaches for Solving the Multiresponse Problem in the Taguchi Method*, 159
- Back, Maribeth, Takashi Matsumoto, and Anthony Dunnigan. *Prototyping a Tangible Tool for Design: Multimedia E-Paper Sticky Notes*, 263
- Beetz, Jakob, Jos van Leeuwen, and Bauke de Vries. *IfcOWL: A Case of Transforming EXPRESS Schemas Into Ontologies*, 89
- Bicharra Garcia, Ana Cristina, Inhauma Ferraz, and Adriana S. Vivacqua. *From Data to Knowledge Mining*, 427
- Borgo, Stefano, Massimiliano Carrara, Pawel Garbacz, and Pieter E. Vermaas. *A Formal Ontological Perspective on the Behaviors and Functions of Technical Artifacts*, 3
- Brown, David C. *Problem Solving Methods: Past, Present, and Future*, 327
- Buckeridge, David L., see O'Connor, Martin J., 339
- Carrara, Massimiliano, see Borgo, Stefano, 3
- Chan, Christine W., see Harrison, Robert, 53
- Chandrasekaran, B. *Problem Solving Methods and Knowledge Systems: A Personal Journey to Perceptual Images as Knowledge*, 331
- Chen, Fumin, see Li, Guo, 119
- Chenouard, R., L. Granvilliers, and P. Sébastien. *Search Heuristics for Constraint-Aided Embodiment Design*, 175
- Chin, Seongah, see Kim, Kyoung-Yun, 71
- Clancey, William J., Maarten Sierhuis, and Chin Seah. *Workflow Agents Versus Expert Systems: Problem Solving Methods in Work Systems Design*, 357
- de Vries, Bauke, see Beetz, Jakob, 89
- Do, Ellen Yi-Luen and Mark D. Gross. *Back to the Real World: Tangible Interaction for Design*, 221
- Domingue, John and Dieter Fensel. *Problem Solving Methods in a Global Networked Age*, 373
- Dunnigan, Anthony, see Back, Maribeth, 263
- Ellis, R. Darin, see Kim, Kyoung-Yun, 71
- Fensel, Dieter, see Domingue, John, 373
- Ferraz, Inhauma, see Bicharra Garcia, Ana Cristina, 427
- Gao, Jianmin, see Li, Guo, 119
- Garbacz, Pawel, see Borgo, Stefano, 3
- Goel, Ashok K., Spencer Rugaber, and Swaroop Vattam. *Structure, Behavior, and Function of Complex Systems: The Structure, Behavior, and Function Modeling Language*, 23
- Grantham Lough, Katie, see Krus, Daniel, 409
- Granvilliers, L., see Chenouard, R., 175
- Gross, Mark D., see Do, Ellen Yi-Luen, 221
- Harrison, Robert and Christine W. Chan. *A Dynamic Knowledge Modeler*, 53
- Horn, Michael S., see Shaer, Orit, 251
- Horváth, Imre, see Verlinden, Jouke, 289
- Ishii, Hiroshi, see Vaucelle, Cati, 305
- Jacob, Robert J.K., see Shaer, Orit, 251
- Kim, Kyoung-Yun, Seongah Chin, Ohbyung Kwon, and R. Darin Ellis. *Ontology-Based Modeling and Integration of Morphological Characteristics of Assembly Joints for Network-Based Collaborative Assembly Design*, 71
- Krus, Daniel and Katie Grantham Lough. *Function-Based Failure Propagation for Conceptual Design*, 409
- Kwon, Ohbyung, see Kim, Kyoung-Yun, 71
- Lau, Kimberly, see Oehlberg, Lora, 237
- Lee, Ho Cheong and Ming Xi Tang. *Evolving Product Form Designs Using Parametric Shape Grammars Integrated With Genetic Programming*, 131
- Li, Guo, Jianmin Gao, and Fumin Chen. *A Novel Approach for Failure Modes and Effects Analysis Based on Polychromatic Sets*, 119
- Li, Ming-Hsien, see Al-Refaie, Abbas, 159
- Li, Zhanjun, Maria C. Yang, and Karthik Ramani. *A Methodology for Engineering Ontology Acquisition and Validation*, 37
- Matsumoto, Takashi, see Back, Maribeth, 263
- Mazalek, Ali and Elise van den Hoven. *Framing Tangible Interaction Frameworks*, 225
- McMahon, Chris and Jos van Leeuwen. *Special Issue: Developing and Using Engineering Ontologies*, 1
- Musen, Mark A., see O'Connor, Martin J., 339

- Nyulas, Csongor, see O'Connor, Martin J., 339
- Oehlberg, Lora, Kimberly Lau, and Alice Agogino. *Tangible Interactions in a Digital Age: Medium and Graphic Visualization in Design Journals*, 237
- Okhmatovskaia, Anna, see O'Connor, Martin J., 339
- O'Connor, Martin J., Csongor Nyulas, Samson Tu, David L. Buckeridge, Anna Okhmatovskaia, and Mark A. Musen. *Software-Engineering Challenges of Building and Deploying Reusable Problem Solvers*, 339
- Ramani, Karthik, see Li, Zhanjun, 37
- Rosen, David W., see Udoyen, Nsikan, 197
- Rugaber, Spencer, see Goel, Ashok K., 23
- Saakes, Daniel and Pieter Jan Stappers. *A Tangible Design Tool for Sketching Materials in Products*, 275
- Seah, Chin, see Clancey, William J., 357
- Sébastien, P., see Chenouard, R., 175
- Shaer, Orit, Michael S. Horn, and Robert J.K. Jacob. *Tangible User Interface Laboratory: Teaching Tangible Interaction Design in Practice*, 251
- Sierhuis, Maarten, see Clancey, William J., 357
- Stappers, Pieter Jan, see Saakes, Daniel, 275
- Štorga, Mario, see Ahmed, Saema, 391
- Tang, Ming Xi, see Lee, Ho Cheong, 131
- Tu, Samson, see O'Connor, Martin J., 339
- Udoyen, Nsikan and David W. Rosen. *Reusability-Based Selection of Parametric Finite Element Analysis Models*, 197
- van den Hoven, Elise, see Mazalek, Ali, 225
- van Leeuwen, Jos, see Beetz, Jakob, 89
- van Leeuwen, Jos, see McMahon, Chris, 1
- Vattam, Swaroop, see Goel, Ashok K., 23
- Vaucelle, Cati and Hiroshi Ishii. *Play-It-By-Eye! Collect Movies and Improvise Perspectives With Tangible Video Objects*, 305
- Verlinden, Jouke and Imre Horváth. *Analyzing Opportunities for Using Interactive Augmented Prototyping in Design Practice*, 289
- Vermaas, Pieter E., see Borgo, Stefano, 3
- Vivacqua, Adriana S., see Bicharra Garcia, Ana Cristina, 427
- Wu, Tai-Hsi, see Al-Refaie, Abbas, 159
- Yang, Maria C., see Li, Zhanjun, 37



Special Issue: Developing and Using Engineering Ontologies

Guest Editorial

CHRIS MCMAHON AND JOS VAN LEEUWEN

Special Issue: Developing and Using Engineering Ontologies 1

Articles

STEFANO BORGO, MASSIMILIANO CARRARA, PAWEL GARBACZ, AND PIETER E. VERMAAS

A Formal Ontological Perspective on the Behaviors and Functions of Technical Artifacts 3

ASHOK K. GOEL, SPENCER RUGABER, AND SWAROOP VATTAM

Structure, Behavior, and Function of Complex Systems: The Structure, Behavior, and Function Modeling Language 23

ZHANJUN LI, MARIA C. YANG, AND KARTHIK RAMANI

A Methodology for Engineering Ontology Acquisition and Validation 37

ROBERT HARRISON AND CHRISTINE W. CHAN

A Dynamic Knowledge Modeler 53

KYOUNG-YUN KIM, SEONGAH CHIN, OHBYUNG KWON, AND R. DARIN ELLIS

Ontology-Based Modeling and Integration of Morphological Characteristics of Assembly Joints for Network-Based Collaborative Assembly Design 71

JAKOB BEETZ, JOS VAN LEEUWEN, AND BAUKE DE VRIES

IfcOWL: A Case of Transforming EXPRESS Schemas Into Ontologies 89

CALL FOR PAPERS

Creativity: Simulation, Stimulation, and Studies 103

CALL FOR PAPERS

Design Pedagogy: Representations and Processes 105

CALL FOR PAPERS

Biologically Inspired Design 107

VOLUME 23

MAY 2009

NUMBER 2

Articles

RAHIB H. ABIYEV

Fuzzy Wavelet Neural Network for Prediction of Electricity Consumption 109

GUO LI, JIANMIN GAO, AND FUMIN CHEN

A Novel Approach for Failure Modes and Effects Analysis Based on Polychromatic Sets 119

HO CHEONG LEE AND MING XI TANG

Evolving Product Form Designs Using Parametric Shape Grammars Integrated With Genetic Programming 131

ABBAS AL-REFAIE, TAI-HSI WU, AND MING-HSIEN LI

Data Envelopment Analysis Approaches for Solving the Multiresponse Problem in the Taguchi Method 159

R. CHENOUARD, L. GRANVILLIERS, AND P. SÉBASTIAN

Search Heuristics for Constraint-Aided Embodiment Design 175

NSIKAN UDOYEN AND DAVID W. ROSEN

Reusability-Based Selection of Parametric Finite Element Analysis Models 197

CALL FOR PAPERS

Creativity: Simulation, Stimulation, and Studies 215

CALL FOR PAPERS

Design Pedagogy: Representations and Processes 217

CALL FOR PAPERS

Biologically Inspired Design 219

VOLUME 23

AUGUST 2009

NUMBER 3

Special Issue: Tangible Interaction for Design**Guest Editorial**

ELLEN YI-LUEN DO AND MARK D. GROSS

Back to the Real World: Tangible Interaction for Design 221**Articles**

ALI MAZALEK AND ELISE VAN DEN HOVEN

Framing Tangible Interaction Frameworks 225

LORA OEHLBERG, KIMBERLY LAU, AND ALICE AGOGINO

Tangible Interactions in a Digital Age: Medium and Graphic Visualization in Design Journals . . . 237

JOHN DOMINGUE AND DIETER FENSEL	
<i>Problem Solving Methods in a Global Networked Age</i>	373
Regular Articles	
SAEEMA AHMED AND MARIO ŠTORGA	
<i>Merged Ontology for Engineering Design: Contrasting Empirical and Theoretical Approaches to Develop Engineering Ontologies</i>	391
DANIEL KRUS AND KATIE GRANTHAM LOUGH	
<i>Function-Based Failure Propagation for Conceptual Design</i>	409
ANA CRISTINA BICHARRA GARCIA, INHAUMA FERRAZ, AND ADRIANA S. VIVACQUA	
<i>From Data to Knowledge Mining</i>	427
CALL FOR PAPERS	
<i>Biologically Inspired Design</i>	443
CALL FOR PAPERS	
<i>Configuration</i>	445
CALL FOR PAPERS	
<i>The Role of Gesture in Designing</i>	447
CALL FOR PAPERS	
<i>Representing and Reasoning About Three-Dimensional Space</i>	449
Author–Title Index for Volume 23, 2009	451
Cumulative Contents for Volume 23, 2009	455
Reviewers for Volume 23, 2009	459

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We thank the following reviewers who participated in manuscript reviews in 2009:

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Editorial

DAVID C. BROWN

Problem Solving Methods: Past, Present, and Future 327

Special Issue Articles

B. CHANDRASEKARAN

Problem Solving Methods and Knowledge Systems: A Personal Journey to Perceptual Images as Knowledge 331

MARTIN J. O'CONNOR, CSONGOR NYULAS, SAMSON TU, DAVID L. BUCKERIDGE,
ANNA OKHMATOVSKAIA, AND MARK A. MUSEN

Software-Engineering Challenges of Building and Deploying Reusable Problem Solvers 339

WILLIAM J. CLANCEY, MAARTEN SIERHUIS, AND CHIN SEAH

Workflow Agents Versus Expert Systems: Problem Solving Methods in Work Systems Design 357

JOHN DOMINGUE AND DIETER FENSEL

Problem Solving Methods in a Global Networked Age 373

Regular Articles

SAEEMA AHMED AND MARIO ŠTORGA

Merged Ontology for Engineering Design: Contrasting Empirical and Theoretical Approaches to Develop Engineering Ontologies 391

DANIEL KRUS AND KATIE GRANTHAM LOUGH

Function-Based Failure Propagation for Conceptual Design 409

ANA CRISTINA BICHARRA GARCIA, INHAUMA FERRAZ, AND ADRIANA S. VIVACQUA

From Data to Knowledge Mining 427

CALL FOR PAPERS

Biologically Inspired Design 443

CALL FOR PAPERS

Configuration 445

CALL FOR PAPERS

The Role of Gesture in Designing 447

CALL FOR PAPERS

Representing and Reasoning About Three-Dimensional Space 449

Author–Title Index for Volume 23, 2009 451

Cumulative Contents for Volume 23, 2009 455

Reviewers for Volume 23, 2009 459