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**Jodi Forlizzi**, Professor, Carnegie Mellon University. E-mail: [forlizzi@cs.cmu.edu](mailto:forlizzi@cs.cmu.edu)  
**Alex Ryan**, Co-Founder, Synthetikos Strategy Consulting.  
E-mail: [alex.ryan@gmail.com](mailto:alex.ryan@gmail.com)  
**Birger Sevaldson**, Professor, Oslo School of Architecture and Design.  
E-mail: [birger.sevaldson@aho.no](mailto:birger.sevaldson@aho.no)



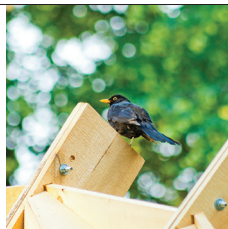
### Editorial

#### Relating Systems Thinking and Design III

This special issue of Form Akademisk captures some of the systemic design thinking and research presented at the RSD3 conference, held in Oslo, Norway in 2014, and the RSD4 conference, held in Banff, Canada in 2015. These two conferences offered a range of submissions encompassing the fields of design, systems, public policy, healthcare, and other domains. This body of work explores the emerging renaissance of systems thinking in design. The papers presented here are responses to the world we live and design in, a world that is increasingly complex and increasingly problematic for those in government, industry and academia alike.

**Marie Davidova**, PhD Candidate, Czech Technical University in Prague.  
E-mail: [marie.davidova@tul.cz](mailto:marie.davidova@tul.cz)

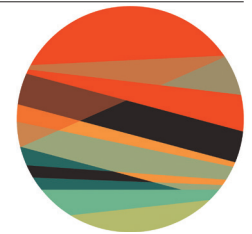
#### Systemic Approach to Architectural Performance The Media Mix in the Creative Design Process



First-hand experiences in several design projects that were based on media richness and collaboration are described in this article. Although complex design processes are merely considered as socio-technical systems, they are deeply involved with natural systems. My collaborative research in the field of performance-oriented design combines digital and physical conceptual sketches, simulations and prototyping. GIGA-mapping - is applied to organise the data. The design process uses the most suitable tools, for the subtasks at hand, and the use of media is mixed according to particular requirements. These tools include digital and physical GIGA-mapping, parametric computer aided design, digital simulation of analyses, as well as sampling and 1:1 prototyping. Also discussed in this article are the methodologies used in several design projects to strategize these tools and the developments and trends in the tools employed. The paper argues that the digital tools tend to produce similar results through given pre-sets that often do not correspond to real needs. Thus, there is a significant need for mixed methods including prototyping in the creative design process. Media mixing and cooperation across disciplines is unavoidable in the holistic approach to contemporary design. This includes the consideration of diverse biotic and abiotic agents.

**Perin Ruttonsha**, PhD Candidate, University of Waterloo.  
E-mail: [perin@perinruttonsha.com](mailto:perin@perinruttonsha.com)

#### The Many Faces of Design From Adaptive Response to Creative Agency to Emergent Engagement



In light of contemporary global pressures, designers have been considering how to apply their thinking and practice more broadly within the enterprise of sustainability. Given the often wicked nature and cross-scale dynamics of related challenges, there is reason to reassess the role of design in processes of systems transformation amidst complexity. In this manuscript, the author contemplates the diversity of 'designerly ways', in interpretation of designers' encounters with complex adaptive systems. These interactions are classified here using the three lenses of adaptive response, creative agency and emergent engagement.

**Jairo da Costa Junior**, Doctoral Candidate, Delft University of Technology.  
E-mail: [j.dacostajunior@tudelft.nl](mailto:j.dacostajunior@tudelft.nl)

**Ana Laura Rodrigues dos Santos**, Post-doc researcher, Delft University of Technology.  
E-mail: [a.l.rodriguesantos@tudelft.nl](mailto:a.l.rodriguesantos@tudelft.nl)

**Jan Carel Diehl**, Assistant professor, Delft University of Technology. E-mail: [j.c.diehl@tudelft.nl](mailto:j.c.diehl@tudelft.nl)



#### Introducing systems-oriented design for complex societal contexts in design engineering education

Faced with large-scale wicked problems that include global warming, resource depletion, poverty and humanitarian emergencies, society needs new and more appropriate reasoning models. In particular, these problems pose unfamiliar challenges in contexts with poor financial and infrastructural resources. Systems-oriented design (SOD) is widely recognised as one promising approach that can support design engineers in addressing these complex societal problems. This paper explores the application of SOD in the development of product-service system (PSS) concepts by student teams in a multidisciplinary master course. The resulting twelve concepts were analysed using a case study approach and protocol analysis, describing the advantages and context- and process-related challenges of using SOD. From an educational perspective, the results demonstrate that while SOD provides students with a broad knowledge base and skills for addressing problems in complex societal contexts, there remains a need to introduce appropriate scope and depth to the design engineering curricula, making the transition from traditional product design a challenging one.

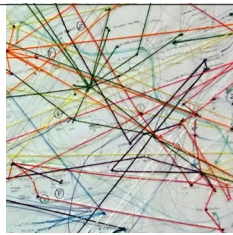
**Maggie Olove**, Post-Graduate, Parsons the New School of Design.  
E-mail: [maggie.ollove@gmail.com](mailto:maggie.ollove@gmail.com)  
**Diala Lteif**, Deputy Director of Faculty, École des Arts-Décoratifs, Lebanon.  
E-mail: [dialalteif@gmail.com](mailto:dialalteif@gmail.com)



## Integrating Systems Thinking and Storytelling An overview

This paper explores the role of design in conflict resolution when doing so means balancing burdened pasts with present uncertainties. To prove its relevance in today's complex problem spaces, design cannot remain stagnant; it must evolve alongside the pace of development. Designing within complexity is unprecedented. Yet, design can define structures that guide an understanding of this complexity. The methodology and case study described in this paper explore how systems thinking, storytelling and grounded theory can contribute to this understanding. The methodology aims to combine subjective perspectives with systemic analyses to create a collective narrative that reveals the multitude of individual understandings of conflicts. Ultimately, this methodology does not attempt to resolve conflict; instead, it aims to provide an in-depth diagnosis of a wicked problem and question the role of design therein.

**Birger Sevaldson**, Professor, Oslo School of Architecture and Design.  
E-mail: [birger.sevaldson@aho.no](mailto:birger.sevaldson@aho.no)



## Redesigning Systems Thinking Discussions on the Relation between Systemic Design and Aesthetics

The recent movement of Systemic Design seeks for new synergies between Design and Systems. While the usefulness of systems approaches in design has been fairly obvious, this paper argues that many core concepts in design are beneficial in systems thinking. This seems reasonable when it comes to the concept of Design Thinking. However, as this paper argues, the more practical core concepts of design are equally important. Designerly skills have been regarded as belonging mainly in the realm of traditional commercial design, whereas design thinking has been regarded as useful in strategic management settings. This paper argues against the idea of separating design thinking from design action. The skills and competences of design, such as the composition of the shape and form that are obvious in product design, are central to Systems Oriented Design (SOD). SOD is a version in the emerging pluralistic field of Systemic Design. The Systemic Design movement should recognise the core values of design and integrate them in systems thinking. This integration would contribute to innovation in both Systemic Design and systems thinking. Among the core competences of design discussed in the paper are composition, choreography, orchestration, the notion of the Gesamtkunstwerk and open-ended multi-scalar design strategies that allow for both structural and organic development. The paper provides examples to support its proposal for the use of concrete aesthetic principles to guide Systemic Design processes.

**Manuela Aguirre Ulloa**, PhD Candidate, Oslo School of Architecture and Design.  
E-mail: [Manuela.Aguirre@aho.no](mailto:Manuela.Aguirre@aho.no)  
**Adrian Paulsen**, Systems and Service Designer, Halogen AS.  
E-mail: [Adrian.Paulsen@halogen.no](mailto:Adrian.Paulsen@halogen.no)



## Co-designing with relationships in mind Introducing relational material mapping

We need to move from object-oriented thinking towards relational thinking for many reasons. As public services become more complex, their design has increasingly focused on the relationships between people. The role of the traditional service staff has been shifting from a 'provider', to a 'facilitator', towards 'enabler' of relationships between service users, their peers, family and/or members of the civil service. Many agree that the future of public services relies on relational services, relational welfare and a relational state. However, we do not share a vocabulary to describe good relationships, nor do we have materials to design for services that support meaningful relationships. We visually perceive the world as fragmented parts rather than seeing their in-between relationships. As our perception is integrated with our cognition, when mapping complex systems we emphasize the nodes rather than the connections between the nodes. Categorizing and colour-coding diverse types of systemic relations are useful to understand complex social systems, but not sufficient to shape them. We propose a multi-sensory systemic design tool that aids public servants, designers and service users in understanding social relationships through the use of physical and sensorial material properties. Testing this tool revealed that people are enabled, within a short timeframe, to create a shared relational vocabulary. This vocabulary can be used as a new design material to co-design novel relational concepts for enhanced relational services.

**Evan Barba**, Assistant Professor, Georgetown University.  
E-mail: [evan.barba@georgetown.edu](mailto:evan.barba@georgetown.edu)

## Systemic Design for Second-Order Effects A Case Study in Sustainability



Second-order effects are changes within a system that are the result of changes made somewhere else in the system (the first-order effects). Second-order effects can occur at different spatial, temporal, or organizational scales from the original interventions, and are difficult to control. Some organizational theorists suggest that careful management of feedback processes can facilitate controlled change from one organizational configuration to another. Recognizing that skill in managing feedback processes is a core competency of design suggests that design skills are potentially useful tools in achieving organizational change. This paper describes a case study in which a co-design methodology was used to control the second-order effects resulting from a classroom intervention to create organizational change. This approach is then theorized as the Instigator Systems approach.