Collaborative Designing Systems

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Note
As agreed via email I am sending now a short paragraph about my position and hand in the full version later.
Thank you for giving me this opportunity.

About collaborative designing systems

With the increasing complexity of systems and applications, interface design has become a complex problem-solving task, which today requires collaborative design teams to be solved. I see many opportunities for intelligent systems in such a creative collaboration process, due to their ability to consider large amounts of information and testing and evaluating alternatives in a short time. Even though the advances in Machine Learning, Artificial Intelligence and Human-Computer Interaction regarding interface design support and generation are impressive, most of these systems often passively observe instead of actively collaborate with a user.

From an interaction design perspective an ideal collaborative designing system would fulfill the criteria of a negotiated mixed initiative collaborative nature. Those were defined within the mixed-initiative concept as two participants that coordinate and negotiate initiatives on an equal basis (Allen, Guinn, and Horvtz 1999). Such an interaction requires certain decisions to be made from a system as: when to engage with the designer or when to pass on the control in a collaborative manner. The uncertain, exploratory nature of designing, where neither the goal, not the design space is specified beforehand and potential solutions are created and rejected iteratively, demands trust in a shared understanding on both sides. Hence, questions that arise are for example: how can a system/ human communicate the intent with a certain suggestion enabling the other party to follow a certain chain of thought or how can a system communicate reasoning behind a design decision, because just understanding the reasoning allows a designer to navigate in the design space - to evolve or reject a solution based on evaluating them in context of previous solutions. Answering those questions involve new forms of information visualization and ways of interacting with intelligent systems, that are able to make itself understandable to humans and reflect its understanding of human. Research in Psychology, Art and HCI already offers first ideas and concepts for answering some of those questions. However, I think the combination of approaches to create a natural collaborative and beneficial interaction in a creative context still requires effort from all participating communities.

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About the author

I am a PhD student in the field of Human-Computer Interaction in the User Interface Group at Aalto University in Finland, focusing on interactive design optimization. My research applies computational sciences, HCI, and design to the problem of principles of collaborative design, even though my background is mainly in HCI. My work ranges from understanding the impact of inspiration and human perception on design, to computationally generate design alternatives in collaborative systems with a designer.

In my previous projects I implemented a perceptual grouping algorithm based on Gestalt Law principles. It allowed computers to detect relations between elements from a human perceptual perspective. Assuming a semantic connection among together perceived elements, I am currently working on a restructuring algorithm of existing web layouts based on those connections. The aim is to create new designs that are able to inspire designers by offering similarly aesthetic and useful interface.

References

Allen, J. E.; Guinn, C. I.; and Horvtz, E. 1999. Mixed-initiative interaction. *IEEE Intelligent Systems and their Applications* 14(5):14–23.