

Contextual Bandits for Design: A Human-Computer Collaboration Approach

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About the Author

- PhD student at the User Interfaces Group, Aalto University
- Background in Interaction Design, Data Engineering and Management
- Focus : Active collaborative interaction between humans and machines in creative tasks like inspiration

Collaboration

Collaboration is ‘a process through which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible’

Collaboration in Design

Collaboration and understanding between participants in a creative process helps to extend the available solution space and facilitates the emergence of creative solution and ideas, which is especially relevant for approaching new problem spaces.

Collaborative AI in Inspiration

Collaborative AI for Inspiration can:

- constructively explore and extend the creative space
- enable framing in constraint situations
- enable similar synergy effect as distributed creativity

Mood Board as a Design Method

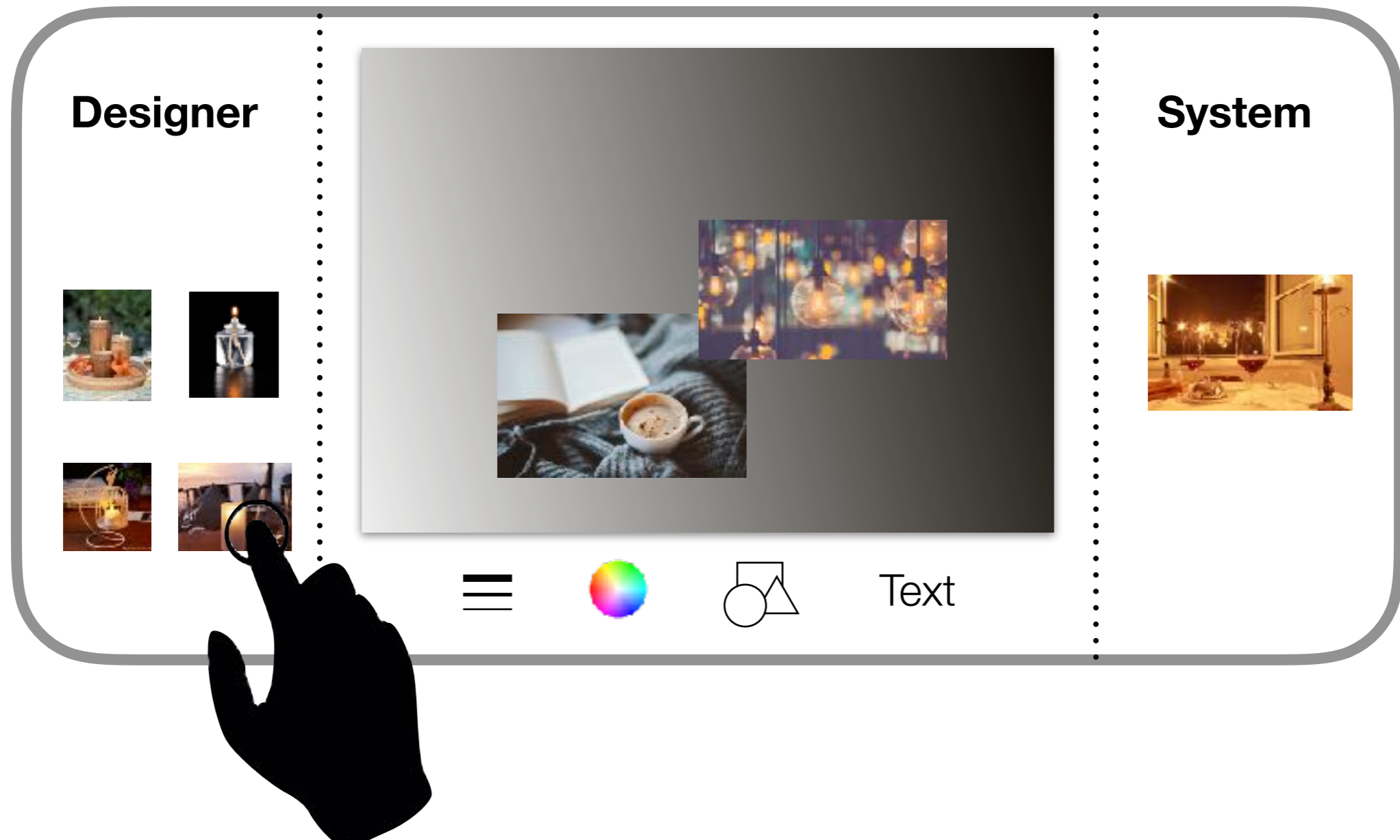


Collaborative AI in Inspiration

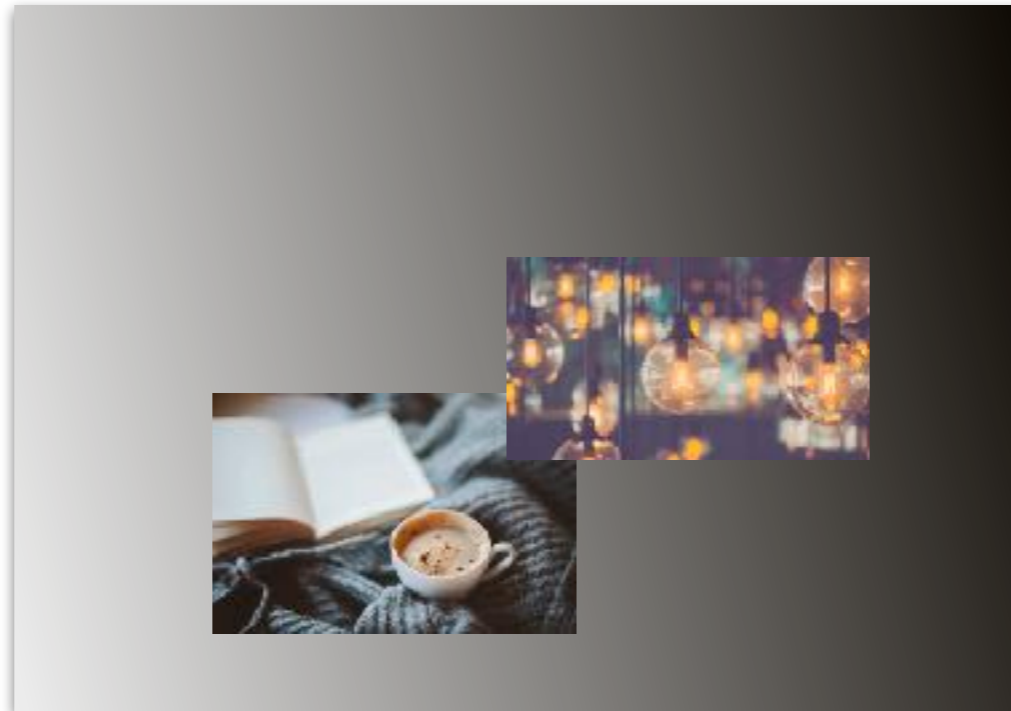
AI in inspiration should:

- (1) be able to make context-dependent decisions,
- (2) change its creative strategies autonomously,
- (3) adapt to current user behaviour

Collaborative Mood Board AI

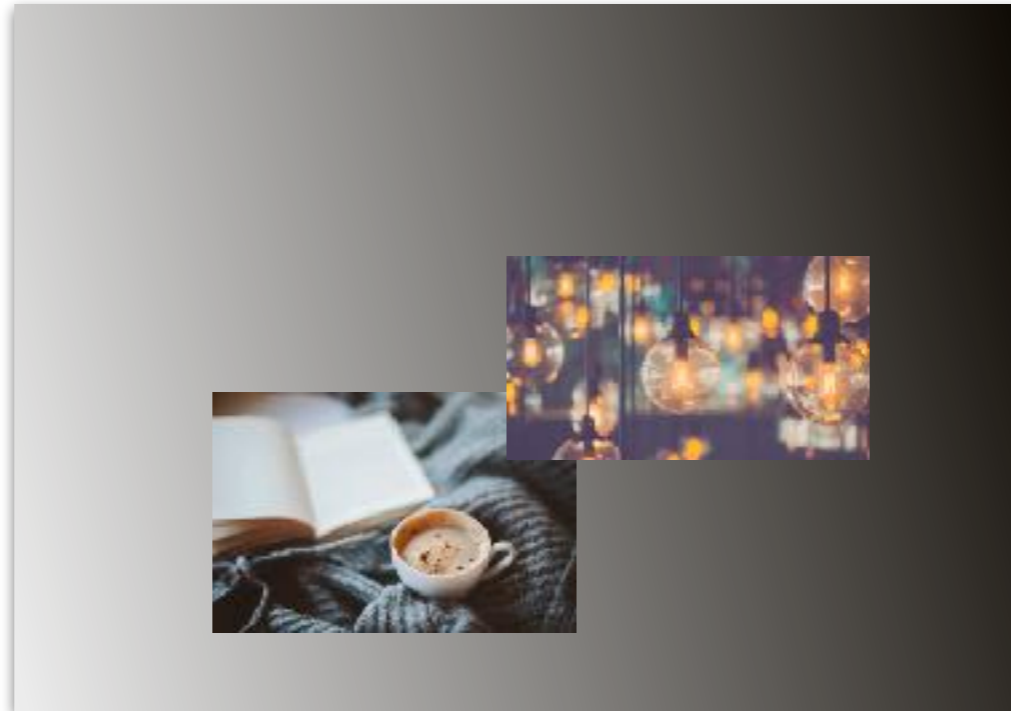


Current Moodboard Context (MB)



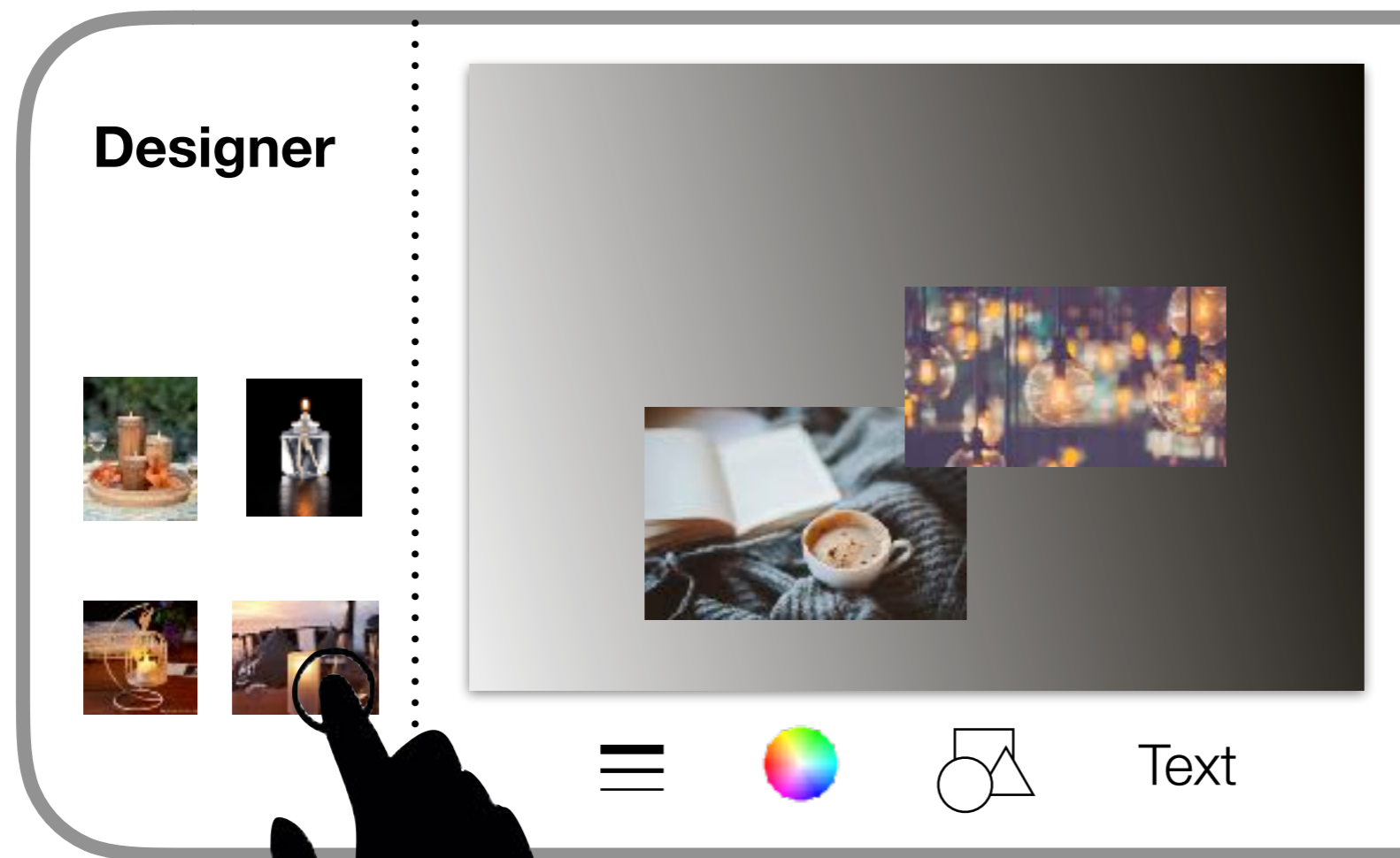
$$MB = \langle C_{15}, S_3, Temp_3, T_3, D_5, O_2 \rangle$$

Current Strategy (A_i)



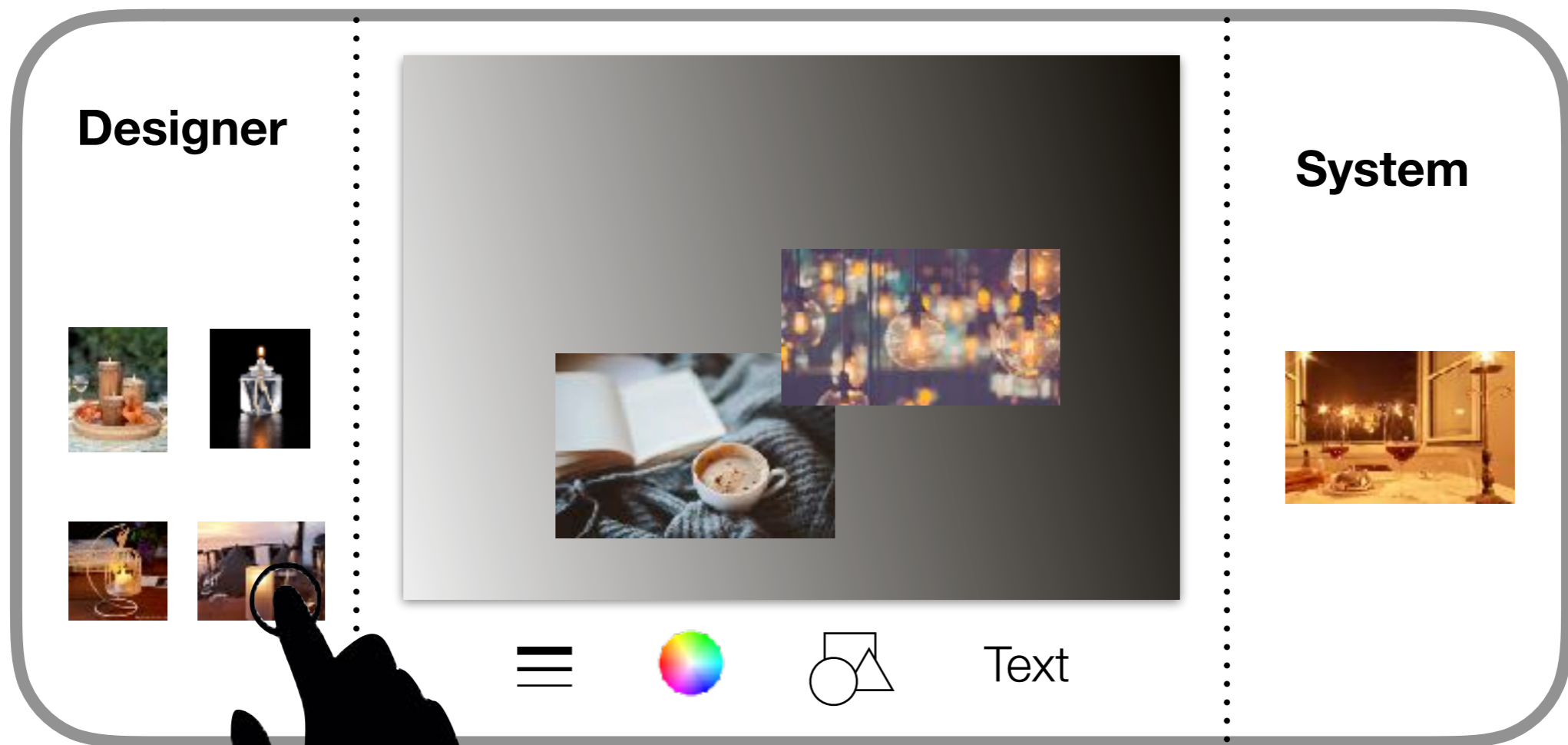
$$A_i = \langle C_5, S_2, Temp_2, T_2, D_3, O_2 \rangle$$

Updated Strategy (A_j)



$$A_j = \langle C_5, S_2, Temp_2, T_2, D_3, O_2 \rangle$$

Contextual Bandit suggestion (V)



Probability distribution
Thompson Sampling
 $V = \langle C, S, Temp, T, D, O \rangle$

Future Work

Collaborative behaviour requires further:

- (1) Reciprocal Theory of Mind
- (2) Common ground on the skills and purpose
- (3) Ability to argue, and find consensus about own beliefs and thoughts

Workshop

I hope I will see and learn in this workshop:

- (1) more approaches to the topic of collaborative behaviour
- (2) discuss perspectives on human - computer partnership
- (3) current results regarding varying user control, and
expressibility of collaborative systems