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Embedded Intelligent Empathy in Design

The project team

		
Dr Anna Chatzimichali Associate Professor Design Engineering and Innovation	Dr Merate Barakat Senior Lecturer Computational Architecture	Dr Yahya Lavaf Pour Senior Lecturer Architecture




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Industrial Partners:
Rheon Labs
Vasthu
Bonnie Binary

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The project team and timeframe

The feasibility study team comprised Dr Anna Chatzimichali (Principal Investigator) from the University of the West of England (UWE Bristol) and Co-Investigators Dr Merate Barakat (UWE Bristol), Dr Yahya Lavaf Pour (UWE Bristol), Prof Ying Liu (Cardiff University) and Dr Mirian Calvo (Lancaster University), including industrial collaborators Rheon Labs, Bonnie Binary and Vasthu. The project commenced in September 2020 and was completed in July 2022.

What does the project demonstrate?

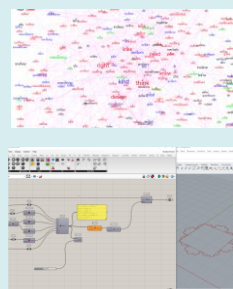
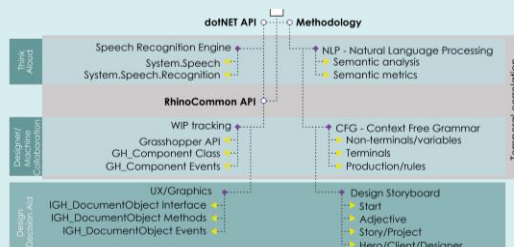
The project explored the extent to which human empathy is integrated in a computational design workflow. We know that computers can intelligently aid design, however it is unclear how empathy plays a role in a design process where computers have an increasingly dominant role. Through a series of collaborative design workshops with industrial partners along with observations of live design workflows, we developed a prototype to record and systematically embed empathy in a computational design workflow. The prototype, which was tested with experts working in real life environments and live projects, is an on-the-fly visual representation of Human/Machine dialogue in computational design.

Outputs and lessons learned

The developed prototype was designed to identify semantic metrics, codify empathy design aspects, and integrate them into the computational design ecosystem, namely Grasshopper3D, utilising Natural Language Processing to enable analyses of verbal design data and Context Free Grammar. Our analysis presented insights in the ways designers are in constant conversation with the computational design tool they use and the algorithm they create, while at the same time pushed the boundaries at the intersection of qualitative data analysis and computational methods.



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Publications

Lavaf, Y., Barakat, M., & Chatzimichali, A. (2021), Embedded intelligent empathy: A systematic review towards a conceptual framework, CAAD Futures 2021, Biannual international conference on computational architecture, 11 – 18 July 2021

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Lavaf Pour, Y., Barakat, M., Calvo, M., & Chatzimichali, A. (2022). Towards Empathy in Computational Design: Co-Design and Semantic Metrics. Tenth International Conference on Design Computing and Cognition. Glasgow: Design Computing and Cognition'22.

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Chatzimichali, Anna; Barakat, Merate Barakat; Pour, Yahya Lavaf; Calvo, Mirian (2022): Co-Design Data Analysis Report - Embedded Intelligent Empathy Project. Based on Industry Engagement Event, Collaborative Design Workshop. Online resource. <https://doi.org/10.6084/m9.figshare.21166624.v1>



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