

Software for a Better Society

Letizia Jaccheri

Department of Computer Science,
Norwegian University of Science and Technology, Norway
Letizia.jaccheri@ntnu.no

Abstract— The main goal of my research through 30 years is to understand how to imagine software for a better society. While researchers traditionally use students as subjects to pilot studies before they are carried out in industrial environments, the supporting pillar of my working method is to set up studies with students that go beyond the contribution to scientific literature and identify benefits for other stakeholders. The four primary actors are: students, instructors, industry, and researchers. Later, in our studies we have identified issues that appear at the intersection between art and software. Artistic software projects have often a social goal and are highly innovative. Our studies in art and software have given the ground for two research directions. The first is maker movement and its role in educational practices. Typical topics of interest vary from engineering -oriented pursuits such as electronics, robotics, 3D printing to the use of art and craft. Leveraging the beneficial outcomes from the Maker Movement approach and programming languages designed for children, together with a group of researchers, and artists we have designed, implemented and evaluated workshop programs. In our studies we have identified the important factors that characterize the design of the activities and the main aspects of children's engagement in such software intensive activities. The second research direction is to harness the power of big data, increase collective and individual awareness about societal problems and ultimately create the needed intelligence that will lead entrepreneurs and policy makers to innovative solutions for societal challenges towards a sustainable society.

Keywords- software, art, children, gender, climate

References:

- [1] Papavlasopoulou, Sofia, Michail N. Giannakos, and Letizia Jaccheri. "Empirical studies on the Maker Movement, a promising approach to learning: A literature review." *Entertainment Computing* 18 (2017): 57-78.
- [2] Stavrinides G.L. and Karatza H.D., "A hybrid approach to scheduling real-time IoT workflows in fog and Cloud environments," *Multimedia Tools and Applications*, Springer, vol. 78, no. 17, pp. 24639-24655, 2019.
- [3] Carver, J. C., Jaccheri, L., Morasca, S., & Shull, F. (2010). A checklist for integrating student empirical studies with research and teaching goals. *Empirical Software Engineering*, 15(1), 35-59.
- [4] Cico, O., Jaccheri, L., Nguyen-Duc, A., & Zhang, H. (2021). Exploring the intersection between software industry and Software Engineering education-A systematic mapping of Software Engineering Trends. *Journal of Systems and Software*, 172, 110736.
- [5] Trifonova, A., Jaccheri, L., & Bergaust, K. (2008). Software engineering issues in interactive installation art. *International Journal of Arts and Technology*, 1(1), 43-65.

About author



Letizia Jaccheri (PhD from Politecnico di Torino, Italy) is a Professor at the Department of Computer Science of the Norwegian University of Science and Technology and adjunct professor at UiT The Arctic University of Norway. Jaccheri has been teaching courses in software engineering at various levels and acted as one of the independent directors of Reply S.p.A., the largest Italian IT company with 9059 employees. From 2013 to 2017 she was department head for the Computer Science department at NTNU. She is ACM Distinguished speaker.

For her work in gender equality, she won two prizes in 2021. Jaccheri has plans to continue to contribute to address the issue of diversity in computer science. Her work is partially supported by This work has been partially supported by the COST Action CA19122 - European Network for Gender Balance in Informatics and by NFR 295920 IDUN.