Experimentation in the digital world

Methods and experimental techniques in computer science and engineering

January 24th & 25th, 9:30h-17:00h,
FAU auf AEG, Fürther Strasse 246b, 90429 Nürnberg, Room 3.1.50a (Stator)

Content

Experimentation does not only take place in the natural sciences, but also in other disciplines such as informatics, engineering or economics. With the growing importance of information technology in business and society, computers and data processing systems have assumed a central role in this context. This, however, creates new methodological challenges for experimentation which have so far received very little attention.

The course presents and analyses methodological issues which emerge when an experimental approach is applied in the context of computer science and engineering. Surpassing a mere technological perspective, the course adopts a wider point of view to understand the challenges of experimentation when data systems are concerned.

Topics addressed in the course will include:

- the conceptual and historical foundations of the experimental method
- the debate on whether and how it is possible to 'import' experimental principles from traditional scientific disciplines to applied disciplines
- the strengths and weaknesses of simulations used as experiments.

The course will critically discuss these issues from a conceptual and methodological perspective, addressing specific cases. It will be organized as a series of lectures and short workshop sessions in which experiences and individual and group reflections are punctuated by discussions. The course language will be English.

About the Teacher:

Prof. Viola Schiaffonati is one of the leading figures in research on experimentation in the applied sciences. She holds the position of an associate professor of Logic and Philosophy of Science at the department for Electronics, Informatics and Bioengineering at the Milano Polytechnic. She worked as a visiting scholar at numerous academic institutions, such as TU Delft, Stanford University, the University of California at Berkeley.

Prof. Schiaffonati is an editor of the recently published "Springer Handbook of Model-Based Science". Her other publications include:

- Amigoni, F., Luperto, M., Schiaffonati, V. (2017). "Toward generalization of experimental results for autonomous robots", Robotics and Autonomous Systems, Elsevier, 90, p. 4-14.
- Schiaffonati, V. (2016). "Stretching the Traditional Notion of Experiment in Computing: Explorative Experiments", Science and Engineering Ethics, Springer, 22(3), p. 647-665.
- Schiaffonati, V., Verdicchio, M. (2016). "Rethinking Experiments in a Socio-Technical Perspective: The Case of Software Engineering", Philosophies, 1(1), p. 87-101.
- Pelillo, M., Scantamburlo, T., Schiaffonati, V. (2015). "Pattern recognition between science and engineering: A red herring?", Pattern Recognition Letters, Elsevier, 64, p.3-10.
- Amigoni, F. et al. (2015). "Competitions for Benchmarking: Task and Functionality Scoring Complete Performance Assessment", Robotics & Automation Magazine, IEEE, 22(3), p. 53-61.
- Schiaffonati, V., Verdicchio, M. (2014). "Computing and Experiments", Philosophy & Technology, Springer, 27(3), p. 359-376.
- Ferrario, R., Schiaffonati, V. (2012). Formal Methods and Empirical Practices. Conversations with Patrick Suppes, Stanford (CA).