



Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich

European Meeting on Applied Evolutionary Economics

12<sup>th</sup> EMAEE Conference – ETH Zurich, Switzerland

August 31<sup>st</sup> - September 1<sup>st</sup> 2023

### **Artificial intelligence as a complex-system revolution of our economies**

EMAEE is back! This 2023 EMAEE conference aims to gather young scholars who are concerned with artificial intelligence viewed as a complex system. Artificial intelligence is gaining tremendous momentum across all spheres of our societies. Its development is becoming a key policy goal, its performance is raising awe and skepticism at once, and its diffusion acts as a promise to challenge existing structures of production, of management, of knowledge generation and diffusion. Such promises, and their associated discontents, come together with an understanding of AI which could be qualified as limited. As of today, our knowledge remains scant about the impact of AI on product market distortion, on labor demand by firms, on skilled-biased technical change, on firms' strategies, on the management of innovation, and on other important issues. Key to a better comprehension is a common understanding of AI as a complex system.

To foster robust and impactful research about AI, we posit that we should look at AI as the combination of many different technical components that interact to deliver a certain output. In other words, we proposed to look at AI as a complex system, i.e. 'a collection of interconnected and interdependent elements, which exhibit behaviors that are difficult to predict or understand using traditional linear cause-and-effect models. These systems are characterized by their non-linear dynamics, feedback loops, and emergent properties, which arise from the interactions between their individual components'. Interestingly, this is the definition of complex systems provided by ChatGPT 3 on April 17, 2023, specifying we wanted a definition consistent with the jargon of management sciences.

This definition of complex system is important because we need to better understand the interactions among the building blocks of AI, as a complex system. For example, Machine Learning (ML) models are made up of different 'pipelines' (i.e. data, model, code). Each of these pipelines has multiple components (e.g. the loss function of the model pipeline). Each evolves both in isolation and in conjunction with the other components. We suggest that, in order to understand the outcomes of ML applications (for example), and their differential impact on different tasks and in different companies and at different levels of analysis, depend on our understanding of the evolution of its fundamental building blocks, and their interactions.

To this end, we encourage submissions that look, empirically and theoretically, at the dynamics of AI as a complex system. We are open to different levels of analysis and to different empirical strategies, with qualitative and quantitative methods. We seek 'granularity', precision, and high observational power, to support a common understanding of AI as a complex system.

**Format:**

Please note, the format of this year's EMAEE conference is different from previous years. This conference will be organized as a workshop, developmental in nature, gathering a small number of scholars with an interest in artificial intelligence. We will accept 15 papers, or fewer. Submissions should take the form of a five-page extended abstract. Senior scholars will attend as discussants.

**When:** August 31 and September 1 2023

**Where:** ETH Zurich, Raemistrasse 101, 8006 Zurich (CH)

**Program:** we start in the early afternoon of August 31<sup>st</sup> to finish end of day September 1<sup>st</sup>.

**Fees:** There are no registration fees. Travel and accommodation are the responsibility of each participant (suggestions for hotels will be provided). ETH Zurich (Chair of Technology and Innovation Management) will cover all catering costs.

**Timeline:** Please submit your five-page extended abstract by **June 15** (midnight CET). Please specify the level of development of the project (idea, data collection initiated or completed, modelling strategy tested, draft of an overall paper already presented at other conferences, etc.) We aim to have a combination of papers at different levels of development. Decisions will be provided by **July 3**. Confirmation of participation should be received by **July 14**.

**Submissions and contact:** Please submit your extended abstract and address any questions to [EMAEE2023@ethz.ch](mailto:EMAEE2023@ethz.ch)

**Organizing Committee:**

**Stefano Brusoni**, ETH Zurich

**Tommaso Ciarli**, UNU-MERIT, United Nations University & SPRU, University of Sussex

**Koen Frenken**, Copernicus Institute of Sustainable Development, Utrecht University

**Lionel Nesta**, Université Côte d'Azur

**Maria Enrica Zamponi**, ETH Zurich

**Axel Zeijen**, ETH Zurich