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Machine Learning and Artificial Intelligence in Economics Research:

Innovative Approaches and Methodologies

Abstract

The dissertation entitled "*Digitalization in the European Public Sector: A labor-saving technology?*" made use of Machine Learning (ML) and Artificial Intelligence (AI) techniques to reach the proposed research objectives. The use of topic modeling, an unsupervised ML technique, facilitated the quantitative analysis of over 6,600 abstracts from two decades of scientific literature in the field of Digital Government. While this was a formidable task two years prior, the advent of Large Language Models (LLMs) such as ChatGPT, Claude, and Gemini, has drastically altered the landscape, enabling the analysis of vast textual datasets with unprecedented speed and efficiency. For the qualitative components of the dissertation, more than ten hours of audiovisual interviews were conducted, necessitating extensive transcription, processing, and analysis. Traditionally, such tasks would require significant time and financial resources, which are often scarce for doctoral candidates. To initially treat this data, automated transcription services were used through a cloud provider facilitated by the host university during my research period abroad in Estonia.

These examples and this privilege to be nominated to the XXIV edition of Premio SIE, will be a great opportunity to make a case to the *Società Italiana di Economia* to call for an *aggiornamento* in the didactic, pedagogical, and research standards within the field of economics. The proliferation of data, coupled with the democratization of ML and AI tools that reduce the necessity for extensive coding knowledge through low-code and no-code solutions, necessitates a revision in current educational and research approaches. Data, in its multiplicity of forms, has become incredibly abundant, and calls for the use of this resource are already found in the literature (Handel et al., 2021; Varian, 2014).

Moreover, integrating data management principles, programmatic workflows, and version control systems can significantly enhance the robustness and reproducibility of research findings (Beckman et al., 2021; Bryan, 2018), an issue that has become very salient given the relatively recent scandals regarding academic integrity and data manipulation in diverse scientific fields. Italian schools of economics urgently need to equip students with the best tools available to empower the next generation of economists to tackle critical economic and societal issues, inform policy, and harness the potential of these novel methods for economic analysis.

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