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Grounded reality meets machine learning: A deep-narrative analysis framework for energy policy research

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Abstract

Text-based data sources like narratives and stories have become increasingly popular as critical insight generator in energy research and social science. However, their implications in policy application usually remain superficial and fail to fully exploit state-of-the-art resources which digital era holds for text analysis. This paper illustrates the potential of deep-narrative analysis in energy policy research using text analysis tools from the cutting-edge domain of computational social sciences, notably topic modelling. We argue that a nested application of topic modelling and grounded theory in narrative analysis promises advances in areas where manual-coding driven narrative analysis has traditionally struggled with directionality biases, scaling, systematisation and repeatability. The nested application of the topic model and the grounded theory goes beyond the frequentist approach of narrative analysis and introduces insight generation capabilities based on the probability distribution of words and topics in a text corpus. In this manner, our proposed methodology deconstructs the corpus and enables the analyst to answer research questions based on the foundational element of the text data structure. We verify theoretical compatibility through a meta-analysis of a state-of-the-art bibliographic database on energy policy, narratives and computational social science. Furthermore, we establish a proof-of-concept using a narrative-based case study on energy externalities in slum rehabilitation housing in Mumbai, India. We find that the nested application contributes to the literature gap on the need for multidisciplinary methodologies that can systematically include qualitative evidence into policymaking.