Use of NLP Techniques and High-Performance Computing for Automated Knowledge Based Ontology Construction of Saffron Crop

Joshi, Manjushri Sanjay; Pangave, Vijaya Vijay (2025.0)

ABSTRACT ORIGINAL

The agriculture industry is very different from other industries, as it depends on many natural and climatic factors. Revolutionary changes are shaking up the way farming is done and opening up new opportunities and challenges. The amount of user-generated information about smart farming, green houses, and indoor farming that is available on the web keeps growing. Learning how to represent language and solve tasks from beginning to end without the help of human experts to extract and create features has made approaches more precise and much more challenging in terms of the number of parameters. This means that they need parallelized and distributed resources for high-performance computing. This chapter gives a knowledge-based representation of the most recent problems, algorithms, and models in the field of agriculture that involve natural language processing. Mainly we consider saffron crop cultivation. Additionally, the impact of high-performance computing for natural language processing (NLP) applications is shown by going into detail about deep learning approaches that use large amounts of data to train models before using them to understand text. In the proposed method, NLP techniques are used to prepare the data; rule-based formal concept analysis and mapping are used to analyze and map the tags that have been reduced; and finally weather, pests, and soil subdomain ontologies are built separately from the saffron agricultural domain data. © 2025 selection and editorial matter, Mukesh Raghuwanshi, Pradnya Borkar, Rutvij H. Jhaveri, and Roshani Raut.