Granular Computing for Explainable Artificial Intelligence

Aim and Motivation:

This special issue aims to offer a comprehensive set of approaches, models, and systems falling under the common umbrella of granular computing to provide explainability to machine learning approaches and applications. Explainable artificial intelligence (XAI) would allow domain experts to validate the outcomes provided by a black box AI algorithm or process to involve those in decision-making processes. To do so, XAI approaches should provide a clear understanding of the reasons behind the outcome of AI models. In this regard, XAI approaches can employ information granulation approaches to aggregate the data instances hierarchically and/or semantically to provide aggregated and human-understandable explanations; represent data instances in a semantically organised manner (e.g. via clustering) to find class prototypes or counterfactuals; employ symbolic or neuro-symbolic modelling to isolate portions of neural networks that are activated by specific symbols (e.g. handwritten symbols can be recognised as groups of strokes); and obtain semantically relevant information granules (e.g. via representation learning) to be employed as concepts for building the explanations. Also, several AI approaches build models that are explainable by design, i.e., do not require any additional procedure to explain to their internal model since those are not black boxes. One of the major deficiencies of the current studies is understanding if the models that are explainable by design can be compatible in terms of accuracy with black box models that need to be explained by the many.

The topics of interest include, but are not limited to:

- Intrinsically explainable granular approaches
- Information granulation approaches with explainable semantic
- Concept-based representation learning
- Natural Language Explanation
- Evaluative AI
- XAI for Fairness
- Granular Approaches to explain Latent Representations
- Clustering approaches to find prototypes, factual and counterfactual explanations
- Symbolic and neuro-symbolic modelling for XAI
- Granular model (explanation, interpretation, visualisation) for decision augmentation and automation
- Application of granular XAI (healthcare, social media, multiagent systems, predictive process monitoring etc)

Guest Editors:

- Antonio L. Alfeo (University of Pisa)
- Erik Cambria (Nanyang Technological University)
- Mario G. C. A. Cimino (University of Pisa)
- Fabio Mercorio (University of Milano-Bicocca)
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Deadlines:

SI submissions deadline: November 2023
First notification of acceptance: January 2024
Submission of revised papers: March 15th 2024
Final notification to authors: April 30 2024

Submission Instruction:

Prepare your paper in accordance with the Journal guidelines: www.springer.com/12559.
Submit manuscripts at: http://www.editorialmanager.com/cogn. Select "SI: Granular Computing for Explainable Artificial Intelligence" for the special issue under "Additional Information." Your paper must contain significant and original work that has not been published nor submitted to any journals. All papers will be reviewed following the standard reviewing procedures of the Journal.