The 21st IEEE International Conference on Machine Learning and Applications (IEEE ICMLA 2022)

Special Session on: **Deep Learning and Ontology**

December 12-15, 2022, The Bahamas, Caribbean

https://www.icmla-conference.org/icmla22/

Background and Aims

In recent years, deep learning has been applied successfully and achieved state-of the-art performance in a variety of domains, such as image analysis and data mining. Despite this success, deep learning models remain hard to analyze and understand what knowledge is represented in them, and how they generate decisions. Deep learning was recently applied to ontologies, where it tries to model data representations with many layers of non-linear transformations. Ontology is a structured knowledge representation that facilitates data access (data sharing and reuse) and assists the deep learning process as well. The combination of deep learning and ontologies might be seen in two ways: (1) Deep Learning for Ontologies: ontology population, ontology extension, ontology learning, ontology alignment, integration, etc. and (2) Ontologies for Deep Learning: semantic graph embeddings, latent semantic representation, hybrid embeddings (symbolic and semantic representations).

This special session aims at demonstrating recent and future advances in semantic rich deep learning for ontologies, which can reduce the semantic gap between the data, applications, and the machine learning process, in order to obtain semantic-aware approaches. In addition, the goal of this session is to bring together an area for experts from industry, science, and academia to exchange ideas and present results of ongoing research in structured knowledge and deep learning approaches.

Scope/Topics

This special session invites submissions of original works that are related – but are not limited to – the topics below:

- Approaches for construction ontology embeddings
- Ontology-based text classification
- Learning ontology embeddings
- Semantic role labelling
- Ontology reasoning with Deep Neural Networks
- Ontology debugging and completion using deep learning methods

- Deep learning for ontological semantic annotations
- Spatial and temporal ontology embeddings
- Ontology alignment and matching based on deep learning models
- Application of deep ontologies to specific domains (e.g. energy, medical, IoT, etc.)
- Ontology learning from text using deep learning models
- Deep Linked Data
- Real-life and industrially relevant applications:
  - Recommender Systems based on Knowledge Graphs
  - Knowledge Graph-Based Sentiment Analysis
  - Question Answering exploiting Knowledge Graphs Embeddings
  - Link Prediction
  - Specific domains exploiting Knowledge Graphs (e.g. Health, Education, Energy, Gaz)

Submission Guidelines and Instructions

Papers submitted for review should conform to IEEE specifications. Manuscript templates can be downloaded from IEEE website[1]. The maximum length of papers is 8 pages. All the papers will go through the double-blind peer-review process. Authors' names and affiliations should not appear in the submitted paper. The authors' prior work should be cited in the third person. Authors should also avoid revealing their identities and/or institutions in the text, figures, links, etc.

Paper Publication

Accepted papers will be published in the IEEE ICMLA 2022 conference proceedings (published by IEEE). A selected number of accepted papers will be invited for possible inclusion, in an expanded and revised form, in some journal special issues.

Important Dates:

- Submission Deadline: September 9, 2022
- Notification of Acceptance: October 7, 2022
- Camera-ready papers & Pre-Registration: October 14, 2022

Special Session Organizers/Chairs:

Sarra Ben Abbès, Research Scientist, ENGIE, France
Email: sarra.ben-abbes@external.engie.com
Philippe Calvez, Research Lab Manager, ENGIE, France

[1] www.ieee.org/conferences_events/conferences/publishing/templates.html

Email: philippe.calvez1@engie.com

Special Session contact e-mail: sarra.ben-abbes@external.engie.com

Programme Committee

Sanju Tiwari, Universidad Autonoma de Tamaulipas, Mexico
Nada Mimouni, CNAM, France
Davide Buscaldi, LIPN, Université Sorbonne Paris Nord, France
Davide Buscaldi, LIPN, Université Sorbonne Paris Nord, France
Lynda Temal, Engie, France
Valentina Janev, Mihajlo Pupin Institute, Serbia
Amir Laadhar, Aalborg University, Denmark
Wei Hu, Nanjing University, China