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Graph-based Methods for Natural Language Processing**

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Preface

Welcome to TextGraphs, the Workshop on Graph-Based Methods for Natural Language Processing. The sixteenth edition of our workshop is being organized on October 16, 2022 in Gyeongju, Republic of Korea, in conjunction with the 29th International Conference on Computational Linguistics (COLING 2022).

For the past sixteen years, the workshops in the TextGraphs series have published and promoted the synergy between the field of Graph Theory (GT) and Natural Language Processing (NLP). The mix between the two started small, with graph-theoretical frameworks providing efficient and elegant solutions for NLP applications. Graph-based solutions initially focused on single-document part-of-speech tagging, word sense disambiguation, and semantic role labeling. They became progressively larger to include ontology learning and information extraction from large text collections. Nowadays, graph-based solutions also target Web-scale applications such as information propagation in social networks, rumor proliferation, e-reputation, multiple entity detection, language dynamics learning, and future events prediction, to name a few.

The target audience comprises researchers working on problems related to either Graph Theory or graph-based algorithms applied to Natural Language Processing, Social Media, and the Semantic Web.

This year, we received 19 submissions and accepted 10 of them. Similarly to the last years, we organized a shared task on natural language premise selection. This task takes as input a mathematical statement, written in natural language, and outputs a set of relevant sentences (premises) that could support an end-user finding a proof for that mathematical statement. The shared task attracted four teams; their participation reports along with the shared task overview by its organizers are also presented at the workshop.

We would like to thank our keynote speaker and we are also thankful to the members of the program committee for their valuable and high-quality reviews. All submissions have benefited from their expert feedback. Their timely contribution was the basis for accepting an excellent list of papers and making the sixteenth edition of TextGraphs a success.

Dmitry Ustalov, Yanjun Gao, Alexander Panchenko, Marco Valentino, Mokanarangan Thayaparan, Thien Huu Nguyen, Gerald Penn, Arti Ramesh, and Abhik Jana

TextGraphs-16 Organizers

October 2022

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Conference Program

9:00–9:30 **Opening Remarks**

9:30–10:30 **Keynote Speaker**

10:30–11:00 **Coffee Break 1**

11:00–12:30 **Oral Session 1**

11:00–11:18 *Multilevel Hypernode Graphs for Effective and Efficient Entity Linking*
David Montero, Javier Martínez and Javier Yebes

11:18–11:36 *Cross-Modal Contextualized Hidden State Projection Method for Expanding of Taxonomic Graphs*
Irina Nikishina, Alsu Vakhitova, Elena Tutubalina and Alexander Panchenko

11:36–11:54 *Sharing Parameter by Conjugation for Knowledge Graph Embeddings in Complex Space*
Xincan Feng, Zhi Qu, Yuchang Cheng, Taro Watanabe and Nobuhiro Yugami

11:54–12:12 *A Clique-based Graphical Approach to Detect Interpretable Adjectival Senses in Hungarian*
Enikő Héja and Noémi Ligeti-Nagy

12:12–12:30 *GUSUM: Graph-based Unsupervised Summarization Using Sentence Features Scoring and Sentence-BERT*
Tuba Gokhan, Phillip Smith and Mark Lee

No Day Set (continued)

12:30–14:00 Lunch Break

14:00–15:30 Oral Session 2

14:00–14:18 *The Effectiveness of Masked Language Modeling and Adapters for Factual Knowledge Injection*
Sondre Wold

14:18–14:36 *Text-Aware Graph Embeddings for Donation Behavior Prediction*
MeiXing Dong, Xueming Xu and Rada Mihalcea

14:36–14:54 *Word Sense Disambiguation of French Lexicographical Examples Using Lexical Networks*
Aman Sinha, Sandrine Ollinger and Mathieu Constant

14:54–15:12 *RuDSI: Graph-based Word Sense Induction Dataset for Russian*
Anna Aksenova, Ekaterina Gavrishina, Elisei Rykov and Andrey Kutuzov

15:12–15:30 *Temporal Graph Analysis of Misinformation Spreaders in Social Media*
Flora Sakketou, Joan Plepi, Henri-Jacques Geiss and Lucie Flek

15:30–16:00 Coffee Break 2

16:00–17:20 Oral Session 3 TextGraphs Shared Task

16:00–16:20 *TextGraphs 2022 Shared Task on Natural Language Premise Selection*
Marco Valentino, Deborah Ferreira, Mokbanarangan Thayaparan, André Freitas and Dmitry Ustalov

16:20–16:35 *IJS at TextGraphs-16 Natural Language Premise Selection Task: Will Contextual Information Improve Natural Language Premise Selection?*
Thi Hong Hanh Tran, Matej Martinc, Antoine Doucet and Senja Pollak

16:35–16:50 *SNLP at TextGraphs 2022 Shared Task: Unsupervised Natural Language Premise Selection in Mathematical Texts Using Sentence-MPNet*
Paul Trust, Provia Kadusabe, Haseeb Younis, Rosane Minghim, Evangelos Milios and Ahmed Zahran

No Day Set (continued)

16:50–17:05 *Keyword-based Natural Language Premise Selection for an Automatic Mathematical Statement Proving*

Doratossadat Dastgheib and Ehsaneddin Asgari

17:05–17:20 *TextGraphs-16 Natural Language Premise Selection Task: Zero-Shot Premise Selection with Prompting Generative Language Models*

Liubov Kovriguina, Roman Teucher and Robert Wardenga

17:20–17:30 Closing Remarks

