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National Recovery and Resilience Plan



OF THE REPUBLIC OF BULGARIA

Scientific group: No: 3.1.12 "Intelligent systems"
FMI, Sofia University "St. Kliment Ohridski"
The main scientific field: "Artificial Intelligence"
Leading scientist: Prof. Ivan Kolev Koychev
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- Prof. Ivan Kolev Koychev – leading researcher
- Prof. Boyan Paskalev Bonchev – established researcher
- Prof. Maria Mihailova Nisheva-Pavlova - established researcher
- PhD student Sylvia Vasileva – young scientist
- PhD student Dimitar Dimitrov - young scientist



SOFIA UNIVERSITY -
MARKING MOMENTUM
FOR INNOVATION AND TECHNOLOGICAL TRANSFER

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Collaboration with researchers from:

- Qatar Computing Research Institute, HBKU, Qatar;
- Mohamed bin Zayed University of Artificial Intelligence, UAE;
- University of Copenhagen, Denmark;
- Sapienza University of Rome, Italy
- University of Padova, Italy
- University of Galway, Ireland,
- Yale University, USA;
- University of Strathclyde, Glasgow, UK
- SRM Institute of Science and Technology, Tamil Nadu, India
- Universidad de Ja' en, Spain,
- Institute of Information and Communication Technologies - BAS, Bulgaria;
- Amazon, Barcelona, Spain,
- Meta AI, USA;
- Ontotext, Bulgaria;
- European Commission

- **Summary**
- 20 + papers were prepared and submitted;
 - 10 + of them were published and presented at international conferences;
 - ~ 10 are under review
 - 10 + citations of the above published papers
- The research is conducted in collaboration with scientists from leading universities and industry research labs.
- 10 + master's students are involved in the conducted research.
- Active in organizing research competitions, workshops, and conferences.

Information Extraction from Medical Text and its Analysis

- Two-level Entailment Classification of Clinical Trials Enhanced by Contextual Data Augmentation
Sylvia Vassileva, Georgi Grazhdanski, Svetla Boytcheva and Ivan Koychev
- Transformer-based Approach for Procedure Recognition and Linking in Spanish Clinical Text,
Sylvia Vassileva, Georgi Grazhdanski, Svetla Boytcheva and Ivan Koychev
- Transformer-based Approach for Symptom Recognition and Linking
Georgi Grazhdanski, Sylvia Vassileva, Ivan Koychev and Svetla Boytcheva

Methods for Disinformation Detection

- A Diverse Multi-Approach Ensemble for Subjectivity Detection in News Articles,
Georgi Pachov, Dimitar Dimitrov, Ivan Koychev, Preslav Nakov
- Detecting Check-Worthy Claims in Political Debates, Speeches, and Interviews Using Audio Data
Petar Ivanov, Ivan Koychev, Momchil Hardalov, Preslav Nakov
- Looking for Traces of Textual Deepfakes in Bulgarian on Social Media
Irina Temnikova, Iva Marinova, Silvia Gargova, Ruslana Margova and Ivan Koychev

Development of generic AI methods, models, and resources

- **bgGLUE: A Bulgarian General Language Understanding Evaluation Benchmark.**

Momchil Hardalov, Pepa Atanasova, Todor Mihaylov, Galia Angelova, Kiril Simov, Petya Osenova, Ves Stoyanov, **Ivan Koychev**, Preslav Nakov, Dragomir Radev

- **Enriched Pre-trained Transformers for Joint Slot Filling and Intent Detection**
Momchil Hardalov, **Ivan Koychev** and Preslav Nakov

- **EXAMS-V: A Multi-Discipline Multilingual Multimodal Exam Benchmark for Evaluating Vision Language Model**

Rocktim Jyoti Das, Simeon Hristov, Haonan Li, **Dimitar Dimitrov**, **Ivan Koychev**, Preslav Nakov

Adaptation and Personalization of Serious Video Games

- Current Trends for Applying GenAI in Game-based Learning.
Albena Antonova, **Boyan Bontchev**
- Personalization in Educational Video Games.
Valentina Terzieva, **Boyan Bontchev**
- Intelligent Adaptation of Difficulty and NPC Behavior in Serious Video Games for Learning.
Ivan Naydeniov, Ilko Adamov, **Boyan Bontchev**

Ongoing Initiatives:

- CLEF CheckThat! Lab Task 3: Persuasion techniques is *a collaboration with the European Commission*.
Dimitar Dimitrov, Nikolay Ribin, Ivan Koychev, Preslav Nakov
- Extending the dataset *Semeval 2021 Task 6: Detection of Persuasion Techniques in Texts and Images*
Preslav Hadzhitsanev, Dimitar Dimitrov, Ivan Koychev, Preslav Nakov
- Increased number of memes and a hierarchical representation of the original 22 persuasion techniques of *Semeval 2021 Task 6: Detection of Persuasion Techniques in Texts and Images*
Dimitar Dimitrov, Firoj Alam, Preslav Nakov, Fabrizio Silvestri, Giovanni Da San Martino
- **Initiative:** Organization of a shared task as part of the 18th International Workshop on Semantic Evaluation (SemEval 2024). [Task 4: Multilingual Detection of Persuasion Techniques in Memes.](#)
Dimitar Dimitrov, Giovanni Da San Martino, Fabrizio Silvestri, Preslav Nakov, Firoj Alam
- CLEF CheckThat! Lab Task 2 Subjectivity Detection.
Dimitar Dimitrov, Georgi Patchov, Dimitrina Zlatkova, Ivan Koychev, Preslav Nakov