Doctoral School of Information and Biomedical Technologies Polish Academy of Sciences

Domain: IT

Research area: Semantic technologies and machine learning in development of intelligent systems

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Place of research: Systems Research Institute Polish Academy of Sciences

Recruitment & Selection: Interview

Number of positions: Multiple (depending on specific interests of the candidates)

Research Area Description:

Recent years have seen second return of "connectionist AI", for development of intelligent systems. However, it has been already realized that connectionist approaches, as we know them (in 2022), are reaching their limits (see, Will Knight, Two rival AI approaches combine to let machines learn about the world like a child, MIT Technology Review, April 8, 2019). In particular, while extremely impressive in solving specific problems in narrow domains, they seem to be missing capabilities of cross-domain generalization.

The aim of the proposed research will be to explore combination of (mainly connectionist) machine learning (ML) and semantic technologies for development of intelligent systems. In particular, the following areas can be investigated (separately, or jointly; this list is not exhaustive and details of doctoral work will be established jointly by the candidate and the advisory team): (a) interplay between the semantic layer and the ML layer, within a data processing pipeline; (b) reasoning and learning from big-data-scale semantic lakes and linked open data; (c) combination of symbolic and statistical ML models in the context of semantic information processing; (d) introduction of semantic methods into semi-automatic feature extraction for ML; (e) introduction of ML into a semantic data fabric.

References – pertinent research of the advisory team:

http://www.ibspan.waw.pl/~paprzyck/mp/cvr/research/IoT.html
http://www.ibspan.waw.pl/~paprzyck/mp/cvr/research/agents_GRID.html
https://www.ibspan.waw.pl/~paprzyck/mp/cvr/research/analytics.html
https://www.ibspan.waw.pl/~paprzyck/mp/cvr/research/semantics.html

Date: 22.05.2022