David M. Cerna, Department of Artificial Intelligence, ICS Prague :

Learning Logic Programs with negation, Predicate Invention, and Higher-Order Definitions Through the learning from Failures Paradigm.

Inductive Logic Programming (ILP) is a form of symbolic machine learning that learns clausal theories to explain sets of positive and negative evidence. Learning complex clausal theories that generalize well remains a formidable challenge. Extending the language over which the clausal theories are constructed results, not only in improved generalization, but also the ability to solve tasks that cannot be properly formulated in the simpler environment. Problematically, such language extensions lead to unsoundness of existing approaches. In this talk, we will introducing the learning from failures paradigm (developed by Andrew Cropper and Rolf Morel) and described extension of the approach that soundly handle the addition of negation, Predicate Invention, and Higher-Order Definitions. (Joint work with Stanisław J. Purgał, Cezary Kaliszyk, and Andrew Cropper).

References:

Learning programs by learning from failures (https://link.springer.com/article/10.1007/s10994-020-05934-z)

Learning Higher-Order Logic Programs From Failures (https://www.ijcai.org/proceedings/2022/378)

Generalisation Through Negation and Predicate Invention (https://arxiv.org/abs/2301.07629?)

David M. Cerna (https://www.cs.cas.cz/dcerna/) is a Scientist at the Czech Academy of Sciences Institute of Computer Science ([CAS ICS](#)) and Principal investigator of the Linz Institute of Technology [Math$_{LP}$](#). Prior to accepting his position at CAS ICS, he spend numerous years at the Research Institute for Symbolic computation ([RISC](#)) as a postdoctoral researcher within several projects ([LOGTECHEDU](#), [GALA](#), [LogicGuard II](#)). He is currently the insitute representative within the [CLAIRE](#) Research Network, and co-representative for Czechia within the Cost Action [EUROPROOFNET](#). His research interest include, but are not limited to, artificial intelligence, automated reasoning, unification, anti-unification, computational logic, and proof theory.

HORA INFORMATICAE (meaning: TIME FOR INFORMATICS) is a broad-spectrum scientific seminar devoted to all core areas of computer science and its interdisciplinary interfaces with other sciences and applied domains. Original contributions addressing classical and emerging topics are welcome. Founded by Jiří Wiedermann, the seminar is running since 1994 at the Institute of Computer Science of the Czech Academy of Sciences in Prague.

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