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MONA-LISA: Multimodal Ontological Neural

Architecture for Linguistic Interactions

and Scalable Adaptations

A Massively-Parallel Architecture for Symbolic

and Subsymbolic Interactions

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Abstract

This paper describes an architecture for symbolic and subsymbolic interactions during machine processing of massively-parallel cognitive activities. The model is centered around a graph-based constraint propagation network which is connected to a recurrent neural network which provides contextually sensitive predictions. The integration of symbolic massive parallelism and subsymbolic neural net PDP processing provides smooth a posteriori learning to the symbolic system and focused guided learning as well as strong constraints during recognition

to the neural network. As the result, the architecture provides the ability to handle strict and structured symbolic constraints during recognition while attaining a smooth contextual prediction ability applied with the least rigidity and learning of input regularities from actual samples. The domain discussed in this paper is natural language understanding for demonstration purposes; however the architecture is expected to show equal strength in other modal channels such as visual inputs.

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