

Semi-Supervised Conceptors and Conceptor Logic

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Conceptors were recently introduced by Herbert Jaeger for the framework of reservoir computing as a mathematical formalism to access the internal representation of concepts by neural networks, but can also be applied to standard feed-forward neural networks.

Their potential applications include controlling dynamics of reservoirs,

denoising and classification of network responses and creating smooth transitions between patterns. On top of this formalism a quasi-Boolean logic was introduced to allow combining conceptors to represent more abstract concepts.

In general, conceptors are a promising idea to connect the subsymbolic behavior of neural networks to a symbolic representation of the high-level concepts corresponding to the underlying computations both in a bottom-up approach of calculating conceptors from neural responses and a top-down approach of applying the conceptors to manipulate the dynamical system given by the (recurrent) neural network.