

## **How (can) machines learn to do the right things?**

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Within the last decade Machine Learning has radically advanced both from a scientific point of view and also from the view of industrial applicability. Applications of Machine Learning range from natural language processing (including sentiment analysis) to classify, for instance, letters of application to real-time image recognition to allow for autonomous driving. One reason for these success stories is the fact that the prevailing technique of deep learning does not require elaborated ontologies but mostly depend on a vast amount of examples to train the neuronal network. However, the more these techniques constitute the back ends in sensitive applications the more there is a need to provide means to establish confidence in the appropriateness and safety of such systems. Classical verification techniques depending on structured and symbolic representations are of little help to solve this issue. Starting with an outline of various approaches in machine learning this talk introduces in the main concepts of deep learning illustrating the correlated issues and directions of establishing trust in applications that use such techniques.