

A Category Goes to Market

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Already many years ago, H.Geiger started to develop an artificial neural network (ANN) paradigm which is of great neurophysiological relevance. Intensive scientific work formed the basis of complex ANN simulations with computers that were and still are applied to hard industrial problem fields. Besides the aspects of learning it is of central interest to study the structure of the Geiger networks. This is the subject of our contribution which focuses on the mathematical (symbolic) aspects. A fruitful cooperation revealed the fact that methods from noncommutative geometry and category theory can be applied to establish a mathematical model of network structuring in a natural way. The model can be exploited to simplify ANN computer simulations in a considerable way leading to an economic effect. This could be observed and demonstrated in an industrial project on optical quality control - a reduction of production costs could be achieved by the application of the model. The overall problem solving in that project integrated symbolic and numerical methods. We briefly describe this project at the end of our contribution. In this sense a “category went to market”.