Neural Networks for Safety-Critical Applications - Challenges, Experiments and Perspectives

Abstract:
We propose a methodology for designing dependable Artificial Neural Networks (ANNs) by extending the concepts of understandability, correctness, and validity that are crucial ingredients in existing certification standards. We apply the concept in a concrete case study for designing a highway ANN-based motion predictor to guarantee safety properties such as impossibility for the ego vehicle to suggest moving to the right lane if there exists another vehicle on its right.