Overview of analog implementations of neural networks

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Abstract

probleme: viele implementierungsmöglichkeiten für analoge nns -> verschiedene vor/nachteile -> vorstellen und vergleichen

- vorteile nachteile neuronale netze analog digital
- implementierungen die neuronale netze analog verwenden finden und beschreiben - vergleichen, metriken für auswahl für implementierung finden

1 Introduction

Neuronal networks (NNs) are becoming increasingly relevant for industry and research. Their power stems from being able to approximate an arbitrary function from just input and output values through training and backpropagation. Therefore they are heavily used already today, for example in image recognition which can be used in medical applications or for autonomous systems such as automotives or roboters. Even in manufacturing they can be used productively, let it be for product design or quality inspection.

In recent research, analog neural networks (ANNs) are occurring more and more frequently, as further improvement in gemeral purpose processors slows down, while the demand for powerful NNs increases, slowly forcing research away from the traditional digital ones.

Even though over 30 years ago research has been conducted already in this topic, new developments and improvements are still being made with great success. Therefore, this paper presents some recent work put into ANNs and compares their architectures against each other. As a result, recommendations can be given on which architecture to use based on metrics of a problem or an already developed neural network which should be transferred to the analog design space.

2 Conclusion

References

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