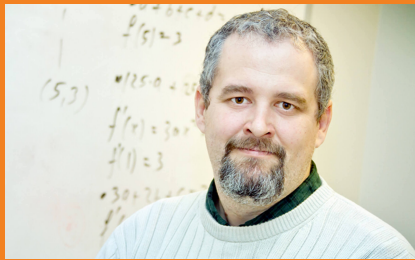


Mathematical Sciences / Computer Science

Spring 2021

Colloquium



Dr. Barnabas Bede
DigiPen Institute of Technology

: Friday, February 5 : 3pm : Zoom Meeting :

Click on this announcement to access the Zoom link

Explainable AI based on the equivalence between Takagi-Sugeno fuzzy systems and neural networks with ReLU activation

Abstract

The recent successes of machine learning and artificial intelligence are widely due to the usage of neural networks and deep learning. Interpretability of neural networks, however, has not been studied as extensively as their applications. Fuzzy systems are based on easily interpretable linguistic rules, but they have been less extensively used in applications compared to neural networks. In the present talk we show that Takagi-Sugeno fuzzy systems with triangular membership functions, under certain conditions, are equivalent with neural networks with ReLU activation. Based on this equivalence we propose a new neural network architecture based on a Takagi-Sugeno fuzzy system with triangular membership function. The proposed system is capable of deep learning, using the backpropagation algorithm. The interpretability of the system is discussed, together with its compatibility with other neural network architectures.

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