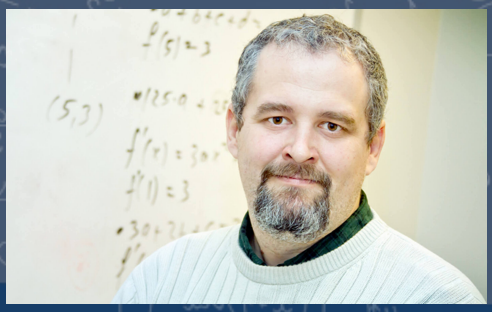
Mathematical Sciences

Spring 2022

Colloquium

Dr. Barnabas Bede

DigiPen Institute of Technology



Bell 130 and Zoom Meeting

Friday, April 8 | 3pm

Click on this announcement to access the Zoom link

Explainable Machine Learning based on Fuzzy Systems

Abstract

In this talk, we will explore the construction of novel fuzzy-based explainable machine learning algorithms. Fuzzy systems are widely used in modeling uncertainty and are based on fuzzy rules describing connections between various variables in this setting. We will start by studying the equivalence between Neural Networks with ReLU activation and Takagi-Sugeno-Kang (TSK) fuzzy systems with triangular membership functions. We prove an equivalence relation between the above mentioned systems under relaxed conditions. As the proofs are constructive, this method allows us to transform between the considered Neural Networks and TSK fuzzy systems. Next we will discuss inter-approximation between TSK and Mamdani fuzzy systems. The interpretability of the proposed models is discussed and future research directions are also explored together with applications.

For further information, please contact Dr. Emil Schwab, eschwab@utep.edu

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