# Development of application-specific adjacency models using fuzzy cognitive map

## ABSTRACT

Neural regression provides a rapid solution to modeling complex systems with minimal computation effort. Recurrent structures such as fuzzy cognitive map (FCM) enable for drawing causeóeffect relationships among system variables assigned to graph nodes. Accordingly, the obtained matrix of edges, known as adjacency model, represents the overall behavior of the system. With this, there are many applications of semantic networks in data mining, computational geometry, physics-based modeling, pattern recognition, and forecast. This article examines a methodology for drawing application-specific adjacency models. The idea is to replace crisp neural weights with functions such as polynomials of desired degree, a property beyond the current scope of neural regression. The notion of natural adjacency matrix is discussed and examined as an alternative to classic neural adjacency matrix. There are examples of stochastic and complex engineering systems mainly in the context of modeling residential electricity demand to examine the proposed methodology.