

A Hybrid System of Hidden Markov Models and Recurrent Neural Networks for Learning Deterministic Finite State Automata

Authors : Pavan K. Rallabandi, Kailash C. Patidar

Abstract : In this paper, we present an optimization technique or a learning algorithm using the hybrid architecture by combining the most popular sequence recognition models such as Recurrent Neural Networks (RNNs) and Hidden Markov models (HMMs). In order to improve the sequence or pattern recognition/ classification performance by applying a hybrid/neural symbolic approach, a gradient descent learning algorithm is developed using the Real Time Recurrent Learning of Recurrent Neural Network for processing the knowledge represented in trained Hidden Markov Models. The developed hybrid algorithm is implemented on automata theory as a sample test beds and the performance of the designed algorithm is demonstrated and evaluated on learning the deterministic finite state automata.

Keywords : hybrid systems, hidden markov models, recurrent neural networks, deterministic finite state automata

Conference Title : ICAMLISC 2015 : International Conference on Artificial Intelligence, Machine Learning and Soft Computing

Conference Location : Cape Town, South Africa

Conference Dates : November 05-06, 2015