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TECHLAV

TOPIC	Sensitivity analysis of hidden Markov models
ORGANIZERS	Student Leadership Council and Faculty of ACIT Institute and TECHLAV Center
AREA	Hidden Markov Models Sensitivity Analysis
SPEAKER	Seifemichael Amsalu (PhD)
DATE	Friday November 18, 2016
TIME	3:00 – 4:00 p.m. (EST)
VENUE	Fort IRC 410, North Carolina A&T State University, UTSA and SIPI will be joining through video-conferencing
FEES	No Charge

SYNOPSIS

Sensitivity analysis is a general technique for investigating the robustness of the output of a system model. Sensitivity analysis of probabilistic networks has recently been studied extensively, which resulted in developing mathematical relations between a parameter and an output probability of interest and also methods for establishing the effects of parameter variations on decisions. Hidden Markov models (HMM) sensitivity analysis has been usually performed by taking small perturbations in parameter values and re-computing the output probability of interest. As recent studies show, the sensitivity analysis of HMM can be done using a functional relationship that describes how an output probability varies as the network's parameters of interest changes To derive this sensitivity functions, existing Bayesian network algorithms have been employed for HMMs. These algorithms are computationally inefficient as the length of the observation sequence and the number of parameters increases. In this study, a new simplified matrix-based efficient algorithm for computing the coefficients of the sensitivity function for all hidden states and all time steps is proposed and will be applied in tuning the parameters of an HMM model to improve accuracy.

ABOUT THE SPEAKER



Seifemichael Amsalu is a 4th year Ph.D. student at North Carolina A&T State University. He is currently a graduate research assistant at the ACIT Institute, working on Driver Models for Both Human and Autonomous Vehicles with Different Sensing Technologies and Near-crash Activity and also Hidden Markov Models Sensitivity Analysis. He received a Bachelor degree in Electrical and Computer Engineering and a Master degree in Communication Engineering, both from Addis Ababa University, Ethiopia in August, 2007 and September, 2011, respectively.