pISSN: 1976-4677 eISS
JOURNAL OF COMPUTING SCIENCE

Search for Articles

JCSE, vol. 16, no. 1, pp.25-42, 2022

DOI: http://dx.doi.org/10.5626/JCSE.2022.16.1.25

Automatic Modulation Recognition Using Minimum-Phase Reconstr Forward Neural Network

Sunday Ajala, Emmanuel Adetiba, Oluwaseun T. Ajayi, Abdultaofeek Abayom Badejo, Sibusiso Moyo, and Murimo Bethel Mutanga
Department of Engineering, Norfolk State University, Norfolk, VA, USA Depar Engineering, Covenant Applied Informatics & Communication Africa Center o University, Ota, Nigeria Institute for Systems Science, HRA, Durban Universit Africa Department of Electrical and Computer Engineering, Illinois Institute o Department of Information and Communication Technology, Mangosuthu Un Durban, South Africa Department of Electrical & Information Engineering, Co Communication Africa Center of Excellence (CApIC-ACE), Covenant Universit Research, Innovation & Engagement, Institute for Systems Science, Durban South Africa Department of Information and Communication Technology, Ma Umlazi, Durban, South Africa

Abstract: Identification of signal waveforms is highly critical in 5G communi radio technologies such as cognitive radios. For instance, to achieve efficient cognitive radios need to implement automatic modulation recognition (AMR) works have been reported in the literature on the subject, most of them hav white Gaussian noise (AWGN) channel. However, addressing the AWGN char emulate real-time wireless communications. In this paper, we created datase Radio. Wireless signal impairment issues such as center frequency offset, sa multipath fading effects were applied for the dataset creation. Afterward, we different artificial neural network (ANN) architectures using real cepstrum co reconstruction coefficients (MPRC) extracted from the created signals. Betwe features have the best performance, and the ANN architecture with Levenbe well as logsig and purelin activation functions in the hidden and output layer

performance of 98.7% accuracy, 100% sensitivity, and 99.33% specificity w
This model can be leveraged in cognitive radio for spectrum sensing and aut
demodulators.

Keyword: Cognitive radio; Cepstrum analysis; GNU Radio; Modulation sche

Korean Institute of Information Scientists and Engineers (KIISE) #401 Meorijae Bldg., 984-1 B
Korea
Phone: +82-2-588-9240 **Fax:** +82-2-521-1352 **Homepage:** http://jcse.kiise.org **Email:**