

Identifying malicious secondary user presence within Primary User Range in Cognitive Radio Networks

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Research Article

Keywords: Primary User, Secondary User, security, misuse, Boundary detection method, Recurrent Neural Network, PU Coverage, Malicious User Detection by Ordering (MUDR), higher detection speed, Precise detection

Posted Date: March 18th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-309430/v1>

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Abstract

Cognitive Radio (CR) is a widely used wireless radio communication to utilize the available spectrum space of licensed users (Primary Users) efficiently. The primary Users (PU) unused spectrum space for a particular period is allocated to the Secondary Users (SU). The most alarming issue in this assignment is security, in which the secondary users disguise as primary users and misuses the allotted spectrum. To address this issue, in this paper we have proposed the Boundary detection method that uses the estimated location of each SU, which is obtained using the Recurrent Neural Network algorithm, to determine the boundary of PU coverage. Then Malicious User Detection by Ordering (MUDO) methodology is proposed, in which all secondary users are ordered, and based on the orders the SUs are paired with corresponding PUs. The SUs with the least orders are discarded as they might be malicious users. The proposed methodology possesses higher detection speed and precise detection thereby enhancing the performance of Cognitive Radio (CR).

Full Text

Due to technical limitations, full-text HTML conversion of this manuscript could not be completed. However, the manuscript can be downloaded and accessed as a PDF.

Figures

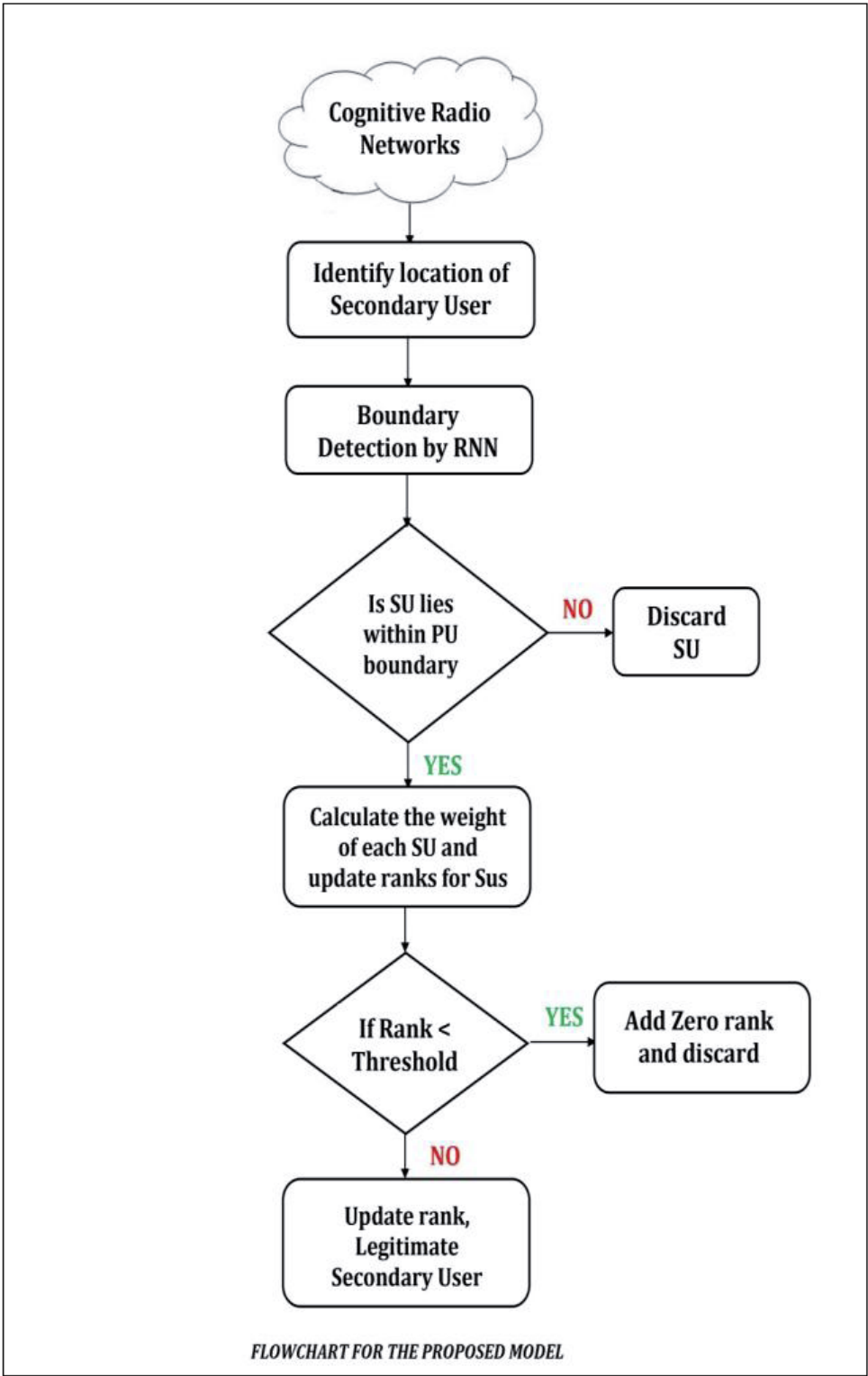
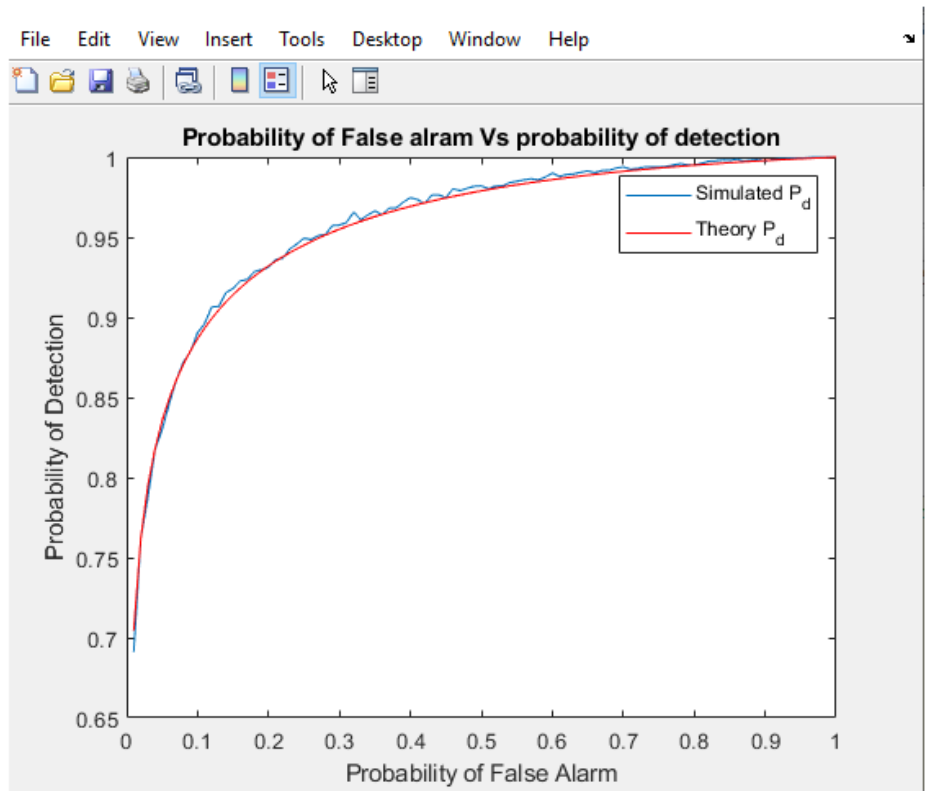


Figure 1

FLOW CHART OF THE PROPOSED METHODOLOGY



0.01, with SNR 10dB and the broadcasting factor at $d=1$.

Figure 2

PERFORMANCE ANALYSIS OF PD AND PF

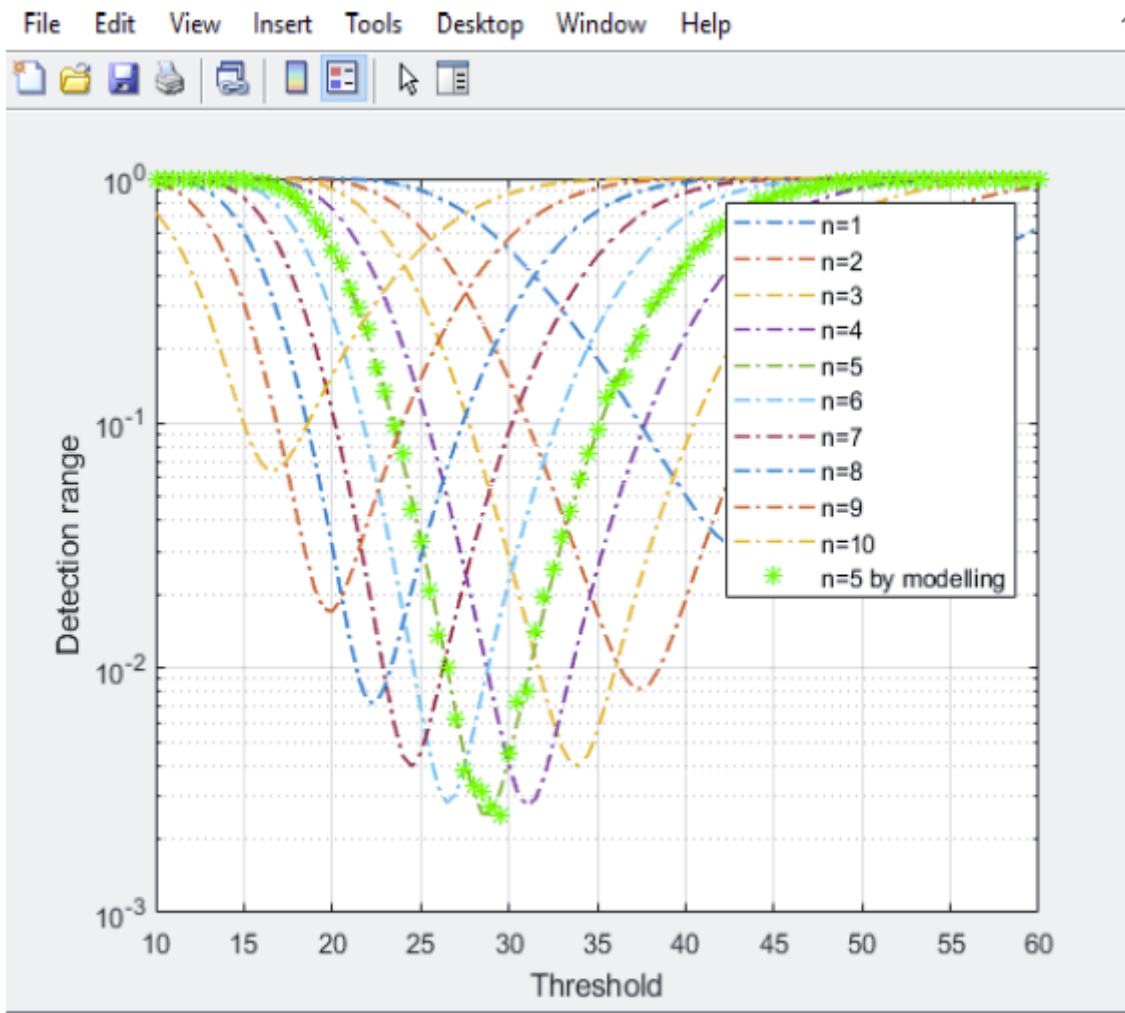


Figure 3

PERFORMANCE ANALYSIS OF BOUNDARY DETECTION ALGORITHM

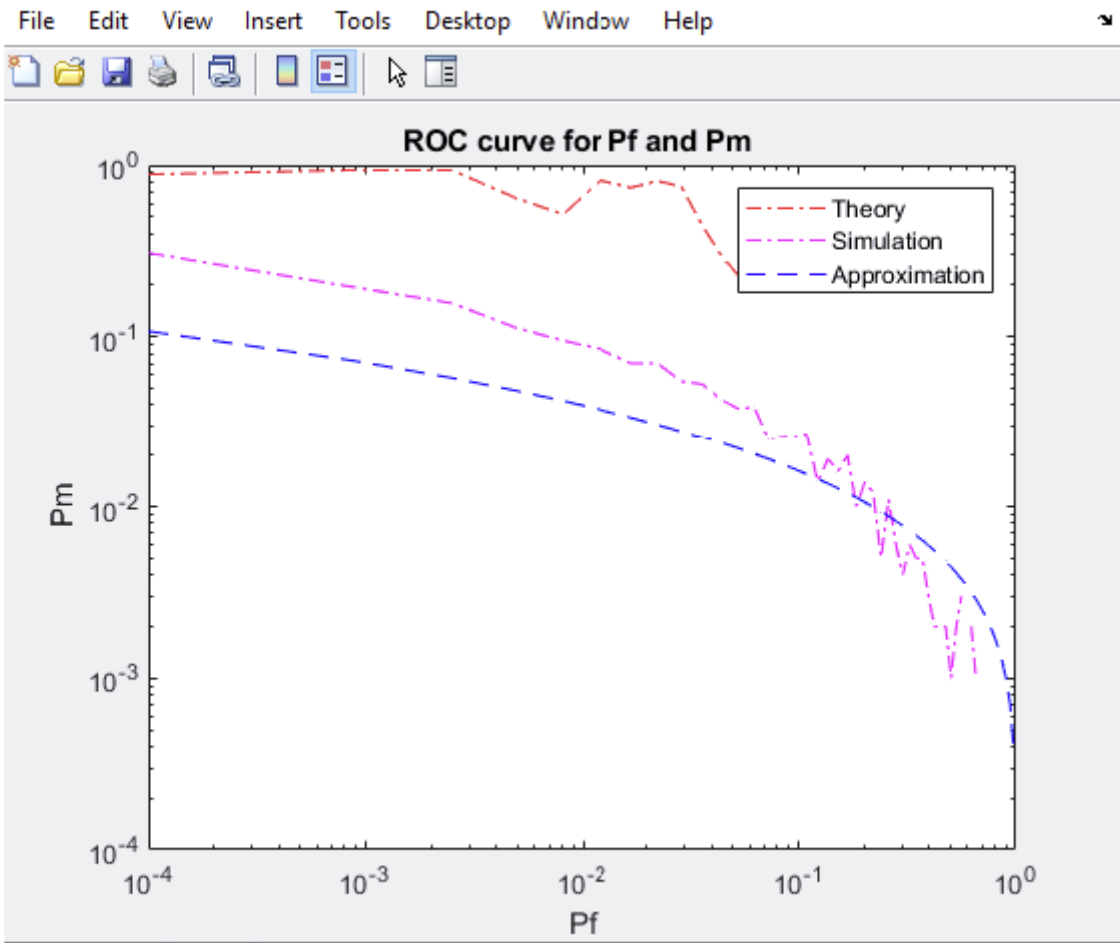


Figure 4

ROC CURVE OF PD AND PF

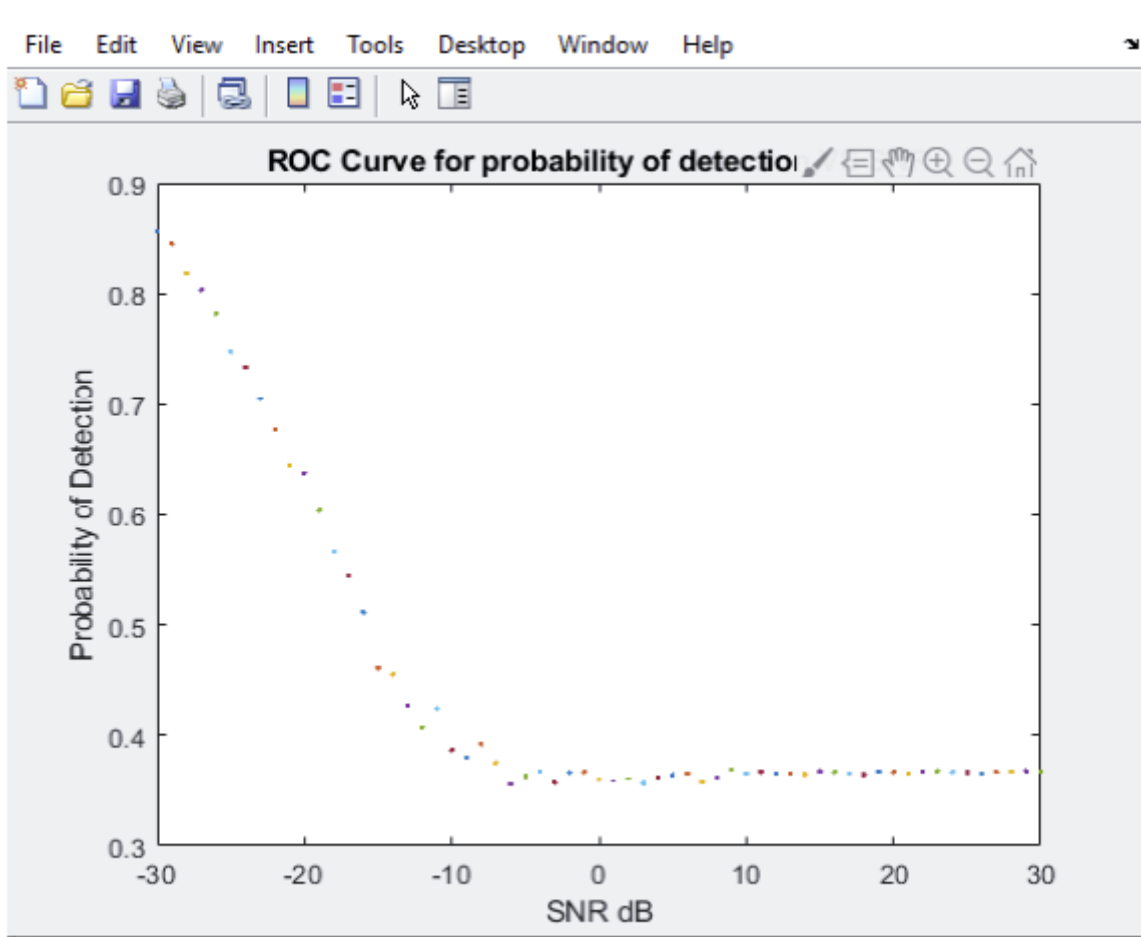


Figure 5

PERFORMANCE ANALYSIS OF PD AND SNR

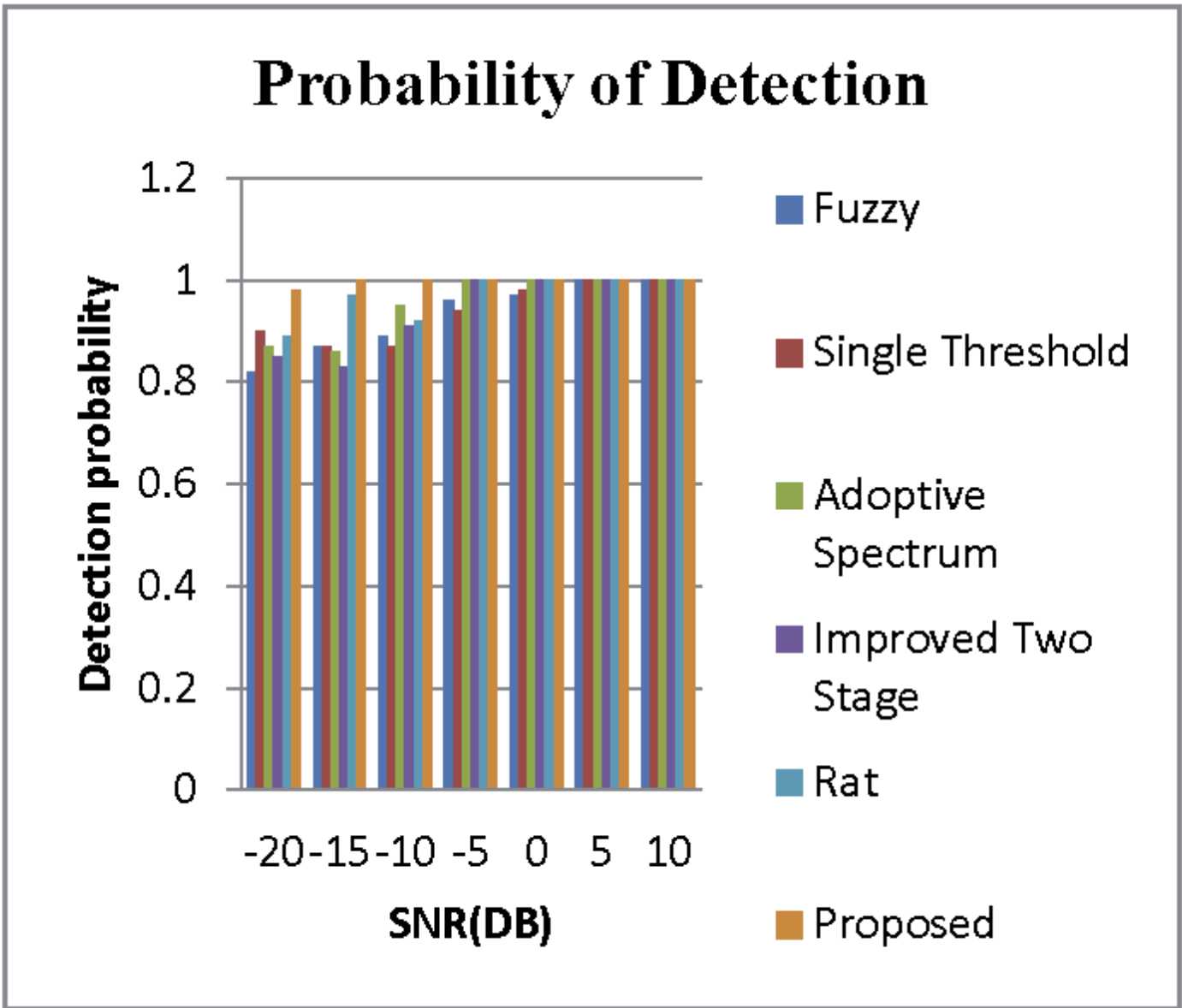


Figure 6

COMPARISON OF OVERALL PROBABILITY DETECTION