Spread Spectrum Modulation Combined with AI in for Jamming Resistant Communication

Swaswati Purkayastha, Kandarpa Kumar Sarma

Department of Electronics and Communication Engineering Gauhati University, Guwahati-781014, Assam, India, purkayasthaswaswati@gmail.com, kandarpaks@gauhati.ac.in

Nikos Mastorakis

Technical University Sofia Sofia, Bulgaria, mastor@tu-sofia.bg

Abstract—Dynamic spectrum access made possible by cognitive radio enables devices to intelligently adjust their transmission characteristics in accordance with the available spectrum. However, the vulnerability of cognitive radio systems is significantly hampered by their susceptibility to jamming assaults. This paper suggests combining spread spectrum modulation (SSM) and artificial intelligence (AI) approaches to produce jamming-resistant communication to overcome this problem. Chaos shift keying (CSK) is used here as a jamming-resistant method in combination with AI. The goal of this study is to assess and contrast the performance of direct sequence spread spectrum (DSSS) and frequency hopping spread spectrum (FHSS) modulation schemes when integrated with AI algorithms. To evaluate the effectiveness of DSSS and FHSS modulation schemes in jamming scenarios, a comprehensive experimentation approach using machine learning classifiers is used. The findings of this study can contribute to the development of more secure and reliable cognitive radio systems, paving the way for their widespread adoption in various applications.