

Octuple Pixel Value Difference Method: Safeguarding Data Confidentiality in Cyber-Physical System Security Through Steganography



Pabak Indu, Shruti Kumari, Shinjini Bhattacharyya,
and Souvik Bhattacharyya

Abstract This research article explores the concept of steganography within the realm of cyber-physical system security, with a particular focus on its crucial function in safeguarding the confidentiality of data. This study delves into the practice of covert communication and underscores its importance in safeguarding confidential data. The study explores various steganographic methodologies, encompassing text steganography, image steganography, network steganography, audio steganography, and video steganography, including the innovative Octuple Pixel Value Difference method. Moreover, it provides insight into the topic of steganalysis, which involves the identification of concealed signals and the many approaches utilized in this domain. Steganography, especially with the incorporation of the Octuple Pixel Value Difference method, has become an essential technique in the field of cyber-physical system security since it plays a crucial role in maintaining the secrecy of data. By acquiring a comprehensive understanding of the fundamental principles and methodologies of steganography, professionals engaged in law enforcement, intelligence operations, and military endeavors can enhance their capacity to protect confidential data within our progressively data-driven society.

Keywords Cyber-physical system security · Octuple pixel value difference method · Embedding capacity analysis · Spatial domain steganalysis

P. Indu (✉)

IEM Centre of Excellence for Cloud Computing and IoT, Department of CSE (AIML) and CSBS,
Institute of Engineering and Management, Kolkata, India
e-mail: pabakindu@yahoo.co.in

Institute of Engineering and Management, University Engineering and Management, Kolkata,
India

S. Kumari · S. Bhattacharyya

Department of Computer Science and Engineering, University Institute of Technology, University
of Burdwan, Burdwan, West Bengal, India

S. Bhattacharyya

Department of Computer Science and Engineering, Dr. Sudhir Chandra Sur Institute of
Technology and Sports Complex, Kolkata, India