Mathematical Aspects of Cryptography and Machine Learning

Pinkimani Goswami[1]

Department of Mathematics, University of Science & Technology, Meghalaya, India Country

E-mail ID: pinkimanigoswami@yahoo.com

Gitumani Sarma[2]

Department of Mathematics, University of Science & Technology, Meghalaya, India

E-mail ID: gmani.sarma@gmail.com

Chayanika Boruah[3]

Department of Mathematics, University of Science & Technology, Meghalaya, India

E-mail ID: cboruah123@gmail.com

ABSTRACT

Cryptography and Machine learning are two most demanding field in this technical era. Cryptography is an art of secret writing. It allows people to transform information secretly from unauthorized people. In today's world, people are mostly depend on electronic medium such as e-mails, ATM machine, e-commerce etc. The rapid increase of information transformation resulted to an increases of the need of security, authenticity etc. and which implies the increases of the use of cryptographic method. Mathematics is an important field in cryptography to build effective cryptographic methods. Finite field theory, number theory, probability theory, complexity theory are some of the important branches of mathematics that are commonly used in cryptography. On the other hand, Machine learning is one of the subarea of artificial intelligence. It makes computers get into a self-learning mode without explicit programming. It has been used in several places such as online search engine, online recommendation engine – friend suggestion in Facebook, offer suggestion from Amazon/ Flipkart, self-driving car etc. The knowledge of mathematics is very important to understand and implementing the machine learning algorithms. Linear algebra, multivariate calculus, probability theory, complexity theory etc. are some of the important topics of mathematics which are used in machine learning. Although cryptography and machine learning are two different field but each field has contributed ideas and techniques to the other field. Therefore, it is worthy to bring both the field together. In this symposium, we basically cover the mathematics behind cryptography and machine learning to motivate the students/ researcher from mathematics background. It will also cover the relationship between cryptography and Machine Learning.

Topics: Cryptography; Machine Learning; Finite Field; Group Theory; Linear Algebra; Number Theory; Probability Theory.