**Abstract**

CAPTCHA (Completely Automated Public Turing test to tell Computers and Humans Apart) is a type of challenge-response test used in computing to determine whether or not the user is human. MAPTCHA is known as Mathematical CAPTCHA. Some researchers proposed different kinds of CAPTCHAs such as puzzle-based CAPTCHAs, mathematical CAPTCHAs, NON-OCR Approach based MAPTCHA, Chinese CAPTCHAs and Geometric & Arithmetic CAPTCHA without database etc. These implementations have some disadvantages like they are time consuming and very much complicated to understand. To overcome the disadvantages of previous CAPTCHA algorithms we have proposed our own MAPTCHA algorithm. This paper presents “*MathSec: Design and Implementation of Novel MAPTCHA Algorithms for Establishing Secured Access”.* In this project, we have proposed two versions of our MAPTCHA algorithm. In version 1, we have rotated the images of operands at different angles clockwise or anticlockwise depending on the random values generated by the random value generator. After implementing our own proposed algorithm, we have found that 60 degree gives us very good results than other angles. So, it should be chosen as the optimum angle to rotate the images of operands. 60 degrees is multiplied with some random values generated by the random value generator distributed uniformly from 0 to 1. Then this angle is used to rotate the images of operands. In version 2, we have taken random text generated by the random text generator, which is merged with integer numbers from 1 to 10. These merging is done with the numbers deviating to downwards slightly and then overlapping with the random text. Though it may at first look slightly hard for the user to solve but if they read the hint then it will be very easy to solve. In version 1, we have generated random angles clockwise or anti-clockwise which make it difficult for the bot to crack it easily. In version 2, we have used integer numbers overlapped with random text which make it difficult for the bots to only recognize the integer numbers using any OCR technique. So, in this paper we have presented our own proposed algorithms and saw how it gives advantages over some previously proposed MAPTCHA algorithms. CAPTCHA is a test which deals with security for a website. So, it is important that we make it a robust and usable one.

**Keywords:** CAPTCHA, Amodal completion, Usable security case, MAPTCHA, rand() function, Optimum angle, MATLAB OCR, MATLAB OCR specifying Character set.