

## Secret Sharing Scheme Using Magic Cube and Latin Squares

Tomoko Adachi, Toho University

A secret sharing scheme is one of cryptography. A Latin square of order  $n$  is an  $n \times n$  array in which  $n$  distinct symbols are arranged so that each symbol occurs in each row and column. A magic square of order  $n$  is an arrangement of  $n^2$  integers  $1, 2, \dots, n^2$  into an  $n \times n$  square with the property that the sums of each row, each column, and each of the main diagonals are the same. It is known that a magic square of order  $n$  can be constructed if  $n$  is an integer for which there is a pair of orthogonal diagonal Latin squares of order  $n$ . In 3 dimension, a magic cube of order  $n$  is an arrangement of  $n^3$  integers  $1, 2, \dots, n^3$  into an  $n \times n \times n$  array with the property that the sums in each 1-dimensional subarray and each of the main diagonals are the same.

In this talk, we provide some secret sharing scheme using a magic cube and Latin squares. This is joint work with Dr. Lu in Tokyo University of Science.

Keywords: Secret sharing scheme, Magic cube, Latin square