



## **Abstract**

Maximum linear feedback shift registers (LFSR) based on primitive polynomials are commonly used to generate maximum length sequences ( $m$ -sequence). An  $m$ -sequence is a pseudorandom sequence that exhibits ideal randomness properties like balance, run and autocorrelation but has low linear complexity. One-dimensional Cellular Automata (1D CA) have been used to generate  $m$ -sequences and pseudorandom sequences that have high linear complexity and good randomness. This thesis considers the use of two-dimensional Cellular Automata (2D CA) to generate  $m$ -sequences and pseudorandom sequences that have high linear complexity and good randomness. The properties of these sequences are compared with those of the corresponding  $m$ -sequences and the best sequences generated by 1D CA.