

# Abstract

**Ahmed Abd Elaziz**

## **Smartphones for Payments and Withdrawals Utilizing Embedded LED Flashlight for High Speed Data Transmission**

Due to the huge dependence of the users on their smartphones and the huge technological advances in their design, smartphones have replaced many electronic devices nowadays. For that reason, it is of great interest to use such phones to replace magnetic cards. This paper uses the builtin Xenon flashlight in today's Android smartphones to experimentally transmit the data stored on the user magnetic card to a card reader automatic teller machine (ATM). We experimentally modulate the embedded Xenon flashlight in a smartphone with the required information of a traditional magnetic card and transmit the light over a secure high speed optical link at 15 bps with no additional hardware at the user end. The paper introduces the design of an implemented small, inexpensive supplementary receiver circuit module, which is easily attached to a contemporary card reader ATM machine. Furthermore, the paper tests the system performance under the effect of interference from another transmitter as well as compares its speed and security to the regular ATM card and to other competing technologies.