Department's Achivements

New Patents Granted to CSE faculties



Patent title: Method For Generating A Secret Key For Encrypted Wireless Communications

The method for generating a secret key for encrypted wireless communications is a physical layer technique that exploits channel randomness between two nodes , the channel being characterized by reciprocity between the two nodes . Reference signals exchanged by the two nodes are used to faun a channel estimate , including gain location and phase location . The gain and phase locations are compared to threshold values , and locations exceeding the respective thresholds are stored in vectors . The moving differences between gain and phase locations at adjacent sampling times define secondary random processes . The moving difference values are quantized and converted to bit streams , which are concatenated to generate the secret key . Measures are provided to reduce parity errors , thereby reducing the bit mismatch rate (BMR) .

Inventors: Dr. Tarek Elfouly, Dr. Amr Mohamed, and Dr. Tamer Khattab

Date of Patent : Sep 2019

Patent title: Non - Coherent Ultra – Wideband Receiver

This patent aims to design a non - coherent ultra - wideband receiver that receives an ultra wideband (UWB) signal, consisting of pulses (or "symbols") and uses on - off keying (OOK) modulation so that when a binary "0" is transmitted, the receiver collects noise - only samples. The receiver collects samples during the symbol (pulse) duration and sorts the samples by magnitude of voltage or energy. The receiver uses the known transmission rate and the estimated signal - to - noise ratio to retrieve a sample index from a look - up table. The receiver then compares the signal sample at the index value with a predetermined threshold voltage (or energy). If the selected sample exceeds the threshold, then it is assumed that all succeeding samples also exceed the threshold (assuming the sort is in ascending magnitude) and the pulse is present and binary "1". Otherwise, the pulse is absent in the sampling period, and binary "O". The process is repeated for the signal duration

Inventors: Dr. Tarek Elfouly

