



Steven Gregor

Faculty Mentors: Dr. Serpedin
Department of Electrical Engineering
Texas A&M University

ABSTRACT

Due to the advancement of computing speeds and system architecture in recent years, it has become apparent that the current methods for wireless communication are limited. But as new methods for processing are created, so are new ways to send data through space. Perhaps the most promising research currently being explored lies in the concepts of Ultra Wide Band (UWB) communication systems.

Current systems used today utilize a single frequency sinusoidal carrier wave to transmit data. UWB systems, however, use all frequencies available in the spectrum to transmit very low power pulses. These pulses can happen very rapidly (over a billion a second) and require far less power than today's transmission systems. However, limitations of the technology are still being worked on. The transmitter structures can become very complicated due to the extremely large bandwidth needed. Also, a very precise timing clock is needed for both the transmitter and receiver, because the receiver must be in perfect sync with the signal in order for the small impulses to be detected.

My project will include learning as much as I can about UWB transmitter and receiver technology, as well as mastering Matlab simulation techniques for digital signal processing. Perhaps some of the limitations of this new idea can be overcome.