Data Hiding for Covert Wireless Communication

EGN 4952C

Electrical Engineering & Computer Science

Sponsored by: Center for Connected Autonomy and AI at FAU

Team Members

James Yackanich

Juan Rivera

Shazil Shahid

Faculty Project Advisor

Dr. George Sklivanitis

Faculty Course Co-ordinator

Dr. Hari Kalva

Ali Altaher

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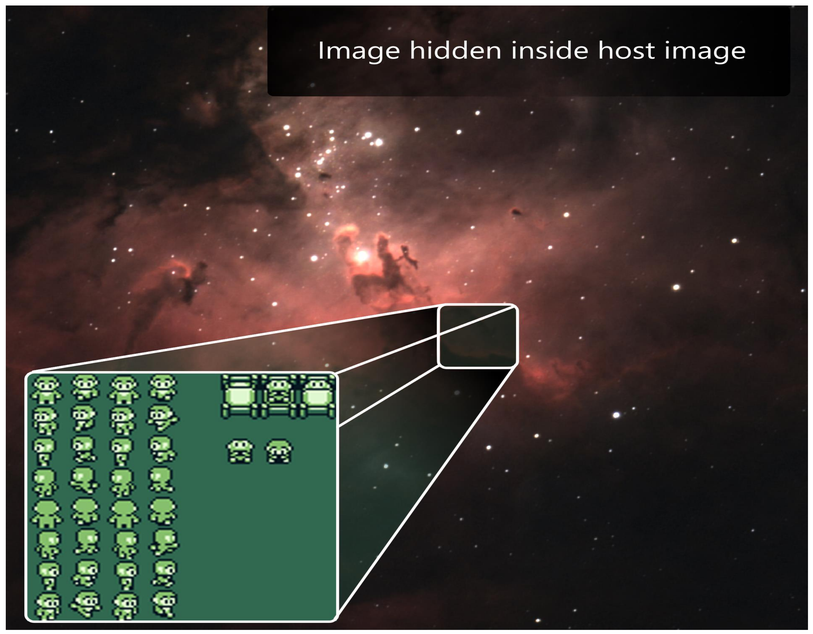

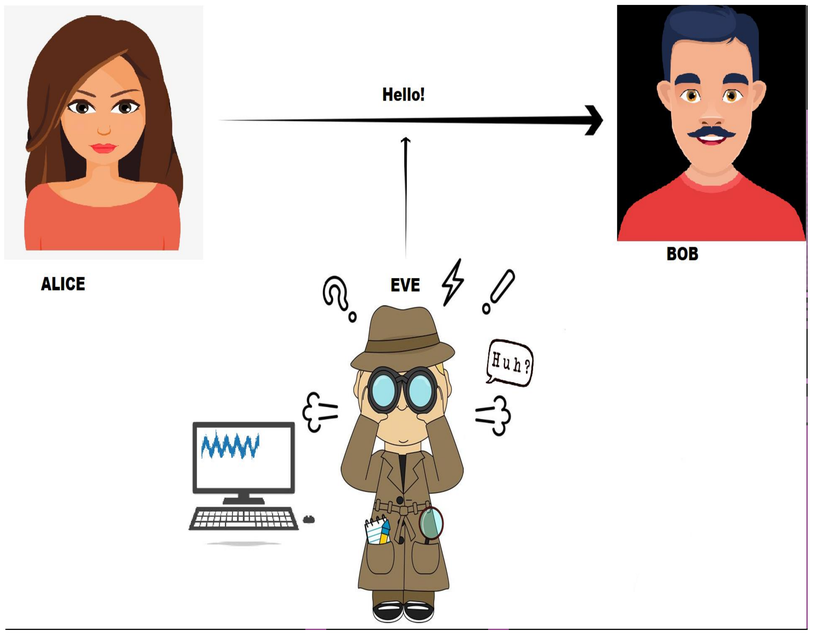

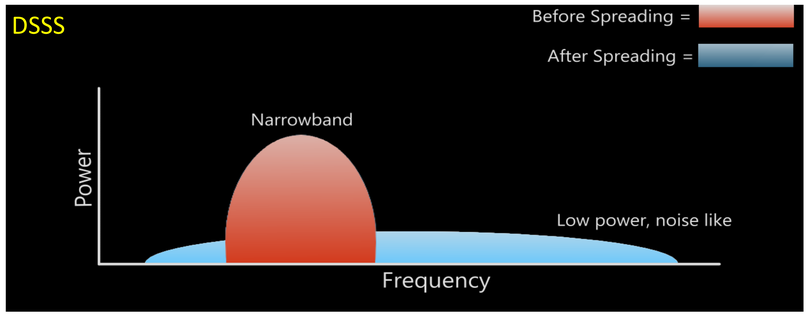

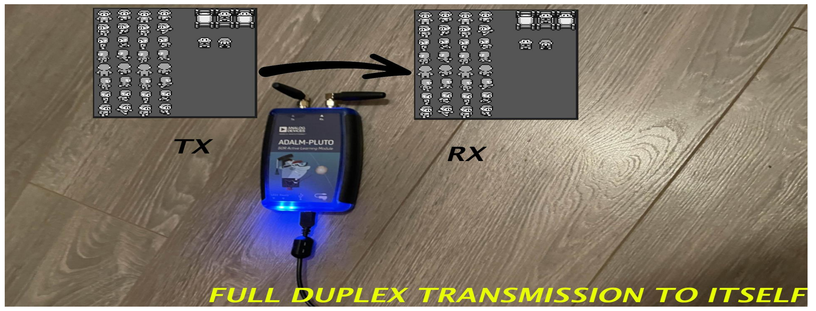

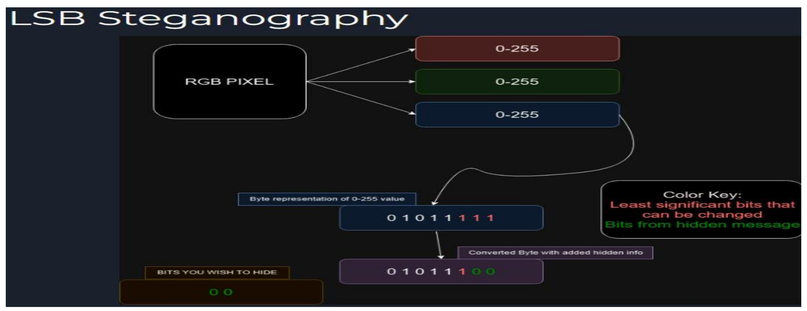

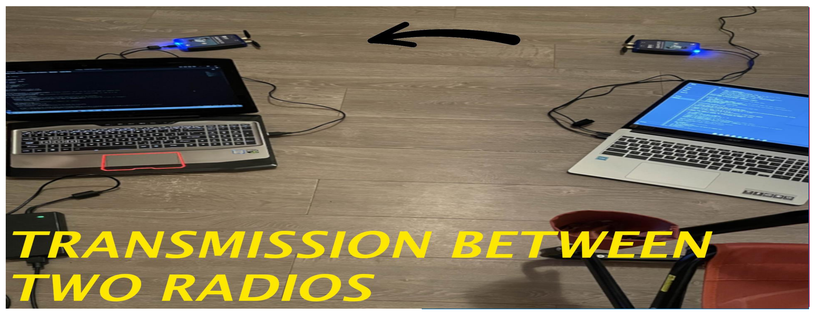

Problem Statement

Undetectable wireless transmissions are fundamental to avoid eavesdroppers or censorship by authoritarian governments. This project will investigate, implement, and compare wireless steganography methods using software defined radios.

Results

- Implemented Least Significant Bit Steganography to transmit images and text covertly
- Implemented Direct Sequence Spread Spectrum to make the signal hard to intercept properly.
- Constructed packets with 11 length barker sequence as preamble
- Successful single radio transmission to itself
- Successful two radio separate computer transmission
- Increased security with shared key to unscramble pseudorandom scrambling

Conclusions & Impact

This project gave us knowledge on programming radios, signal processing, and how to think of security from both an attacker and defender point of view. If the spreading sequence was found, LSB would be cracked quickly, so additional security was added.