

# UNIVERSITY OF SOUTH FLORIDA

## Defense of a Doctoral Dissertation

Keyless Anti-Jamming Communication via Randomized DSSS

by

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For the Ph.D. degree in Computer Science and Engineering

Spread spectrum techniques including Direct Sequence Spread Spectrum (DSSS) and Frequency Hopping Spread Spectrum (FHSS) are used widely as a countermeasure against jamming attacks. In recent years, the DSSS based system has been used to achieve the anti-jamming systems without a pre-shared secret key. Delayed Seed-Disclosure DSSS (DSD-DSSS) is one of these systems that uses a random seed to generate multiple spreading codes to spread an original message. However, it discloses the information of a random seed in a way that it is vulnerable to the attacker. In this research, we propose a new system that mainly focuses on concealing a random seed from the attacker by inserting it at a random position of a spreading message. We develop a new technique to identify the location of a random seed at a receiver by aligning between multiple received messages. Our evaluation and simulation results show that a receiver can obtain the position of a random seed. Then he can recover both a random seed then regenerating the spreading codes used to spread an original message.

### Examining Committee

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11:00 AM  
ENB 313

**THE PUBLIC IS INVITED**

### Publications

- 1) **A. Alagil** and Y. Liu, "Randomized positioning dsss with message shuffling for anti-jamming wireless communications," in 2019 IEEE Conference on Dependable and Secure Computing (DSC), Nov 2019, pp. 1–8.
- 2) **A. Alagil** and Y. Liu, "Random allocation seed-dsss broadcast communication against jamming attacks," in proceedings of the 2019 international conference on Security and Privacy in Communication Networks (Securecomm), Oct 2019.
- 3) **A. Alagil** and Y. Liu, "Wireless Jamming Attack," in: Shen X., Lin X., Zhang K. (eds) Encyclopedia of Wireless Networks. Springer, Cham.
- 4) **A. Alagil**, M. Alotaibi, and Y. Liu, "Randomized positioning dsss for anti-jamming wireless communications," in 2016 International Conference on Computing, Networking and Communications (ICNC), Feb 2016, pp. 1–6.

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