

IOTWeek

Dublin — June 20-23, 2022

Secure Communication Based on Robust 3D Localization

George N. Karystinos (PI)

GLOBAL VISION:

IoT TODAY AND BEYOND

IOTForum

Project Overview

- **Open Call 3**
 - Oct. 2021 – May 2022
- **Partners**
 - EU: Technical University of Crete
Prof. Karystinos, Dean of School of Electrical & Computer Eng.
 - US: Florida Atlantic University
Prof. Pados, Director of Center for Connected Autonomy & Artificial Intelligence
(funded by NSF supplemental grant for experimentation on POWDER platform)

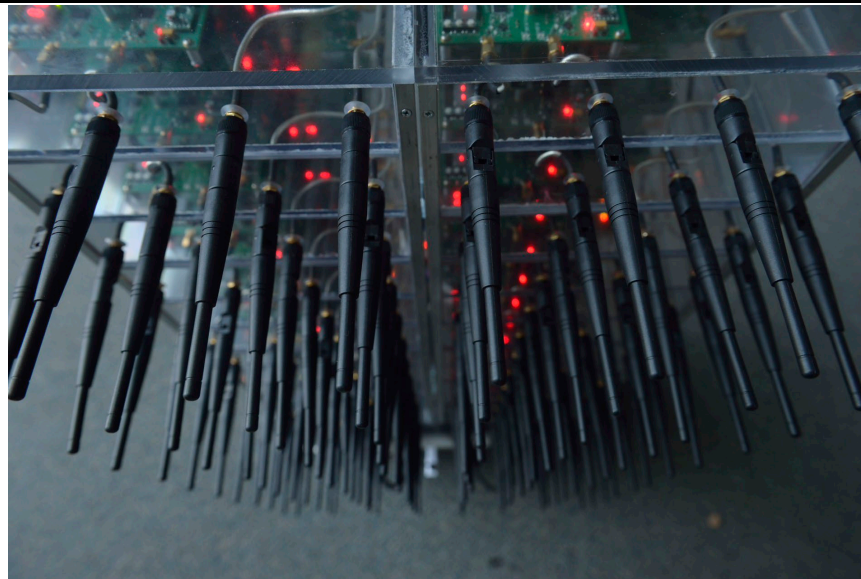


ΠΟΛΥΤΕΧΝΕΙΟ ΚΡΗΤΗΣ
TECHNICAL UNIVERSITY OF CRETE



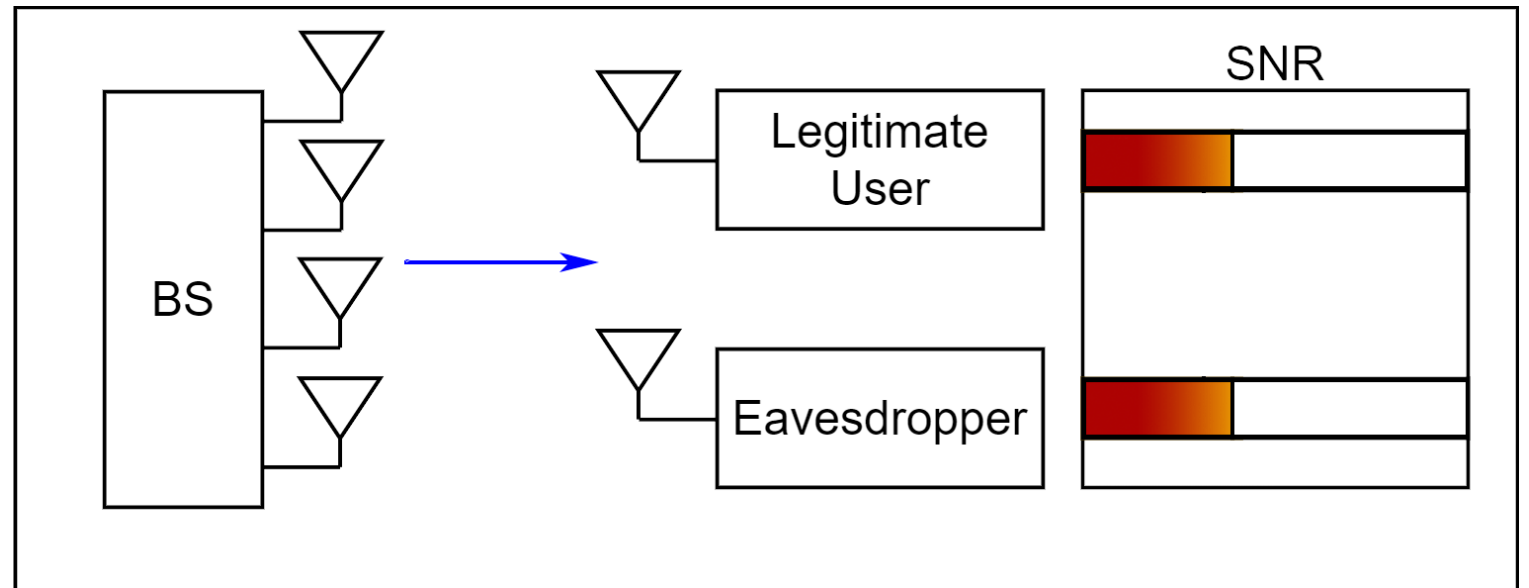
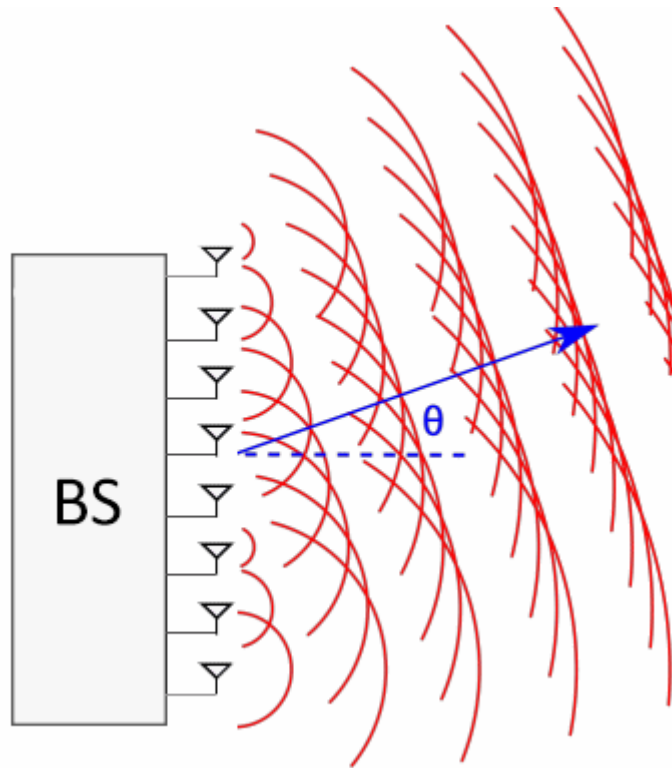
**CENTER FOR CONNECTED AUTONOMY
AND ARTIFICIAL INTELLIGENCE**
College of Engineering and Computer Science
Florida Atlantic University

Experiment Description

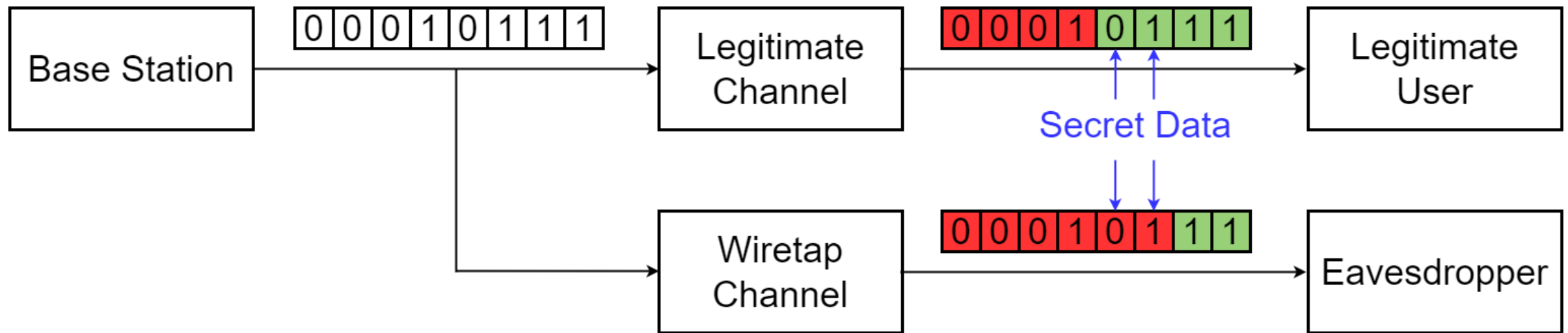


- **ArgosV2 data sets:** UHF, 2.4GHz, and 5GHz bands, diverse environments, up to 104 base station antennas.
- **Securing wireless transmissions:**
 - Front-line security
 - ✓ Spatial security (making the signal inaccessible, through beamforming)
 - ✓ Coding-induced protection (through polar codes)
 - Argos data calibration

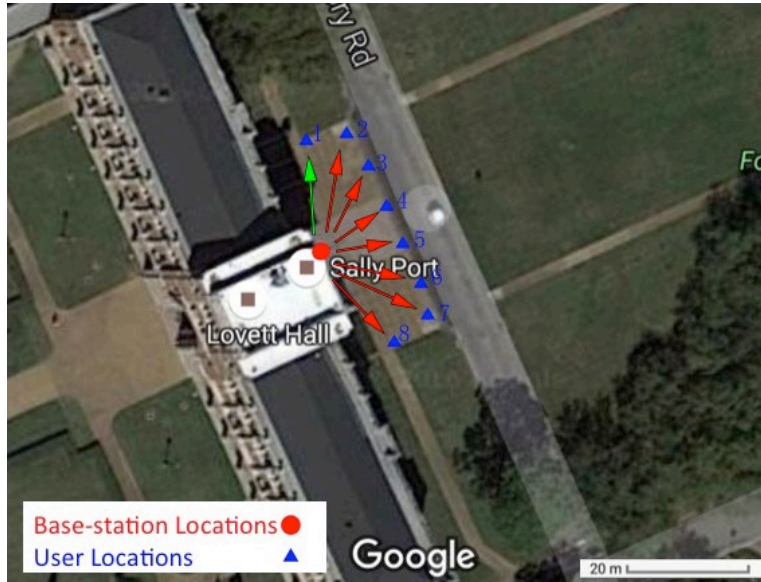
Beamforming



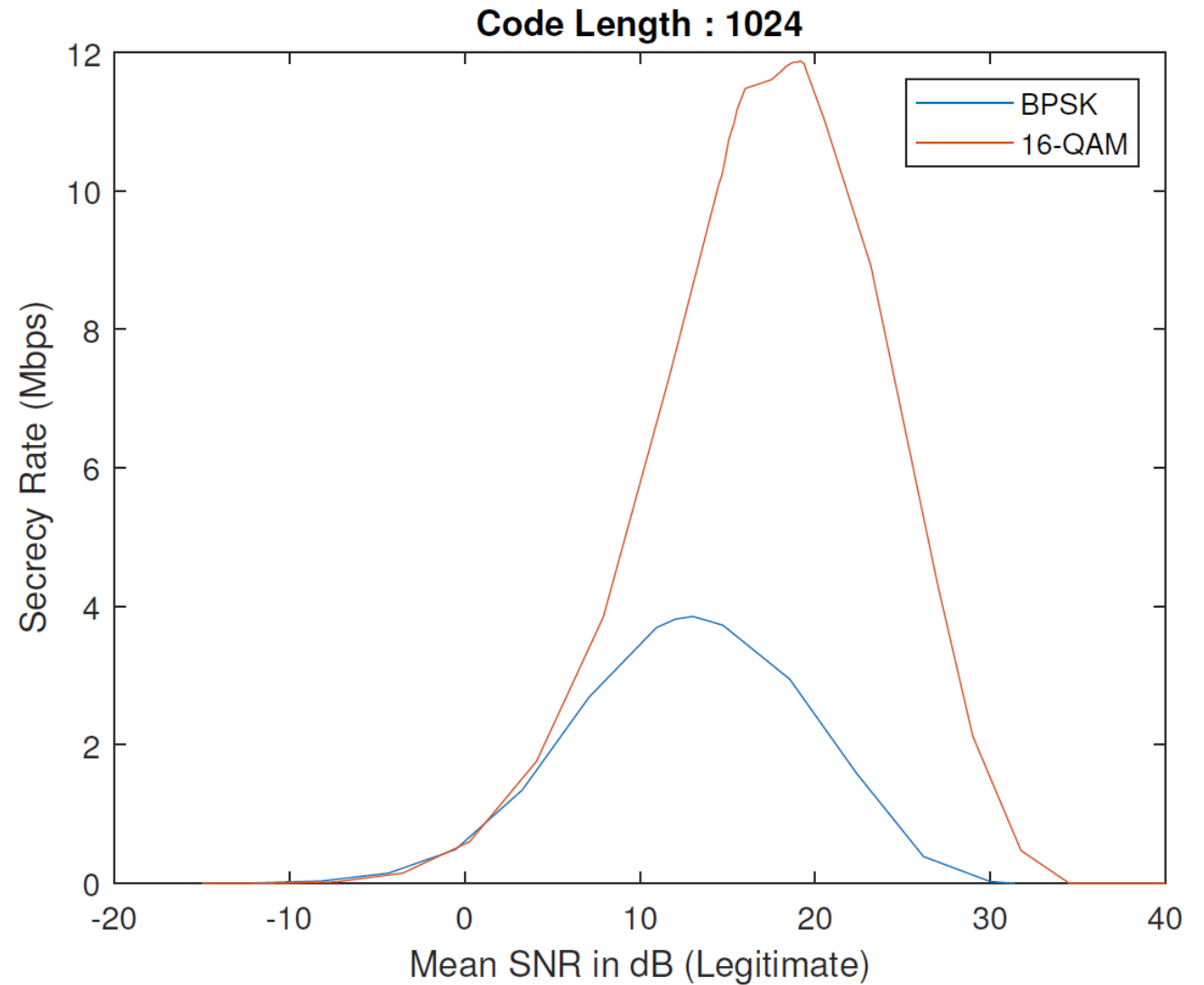
Polar Coding



Experiment Results



[pictures from renew-wireless.org/datasets]



Highlights and Next Steps

Highlights

- FAU-TUC technical exchange through NSF-EU initiative
- Use of POWDER platform
- Workshop on coding, data processing, time/space-series analysis, and security [Florida Atlantic University, May 18]
- POWDER data set calibration

Next Steps

- Accomplishments beyond and after this NSF-EU collaboration
- Investigation of secrecy coding for OFDM-based adaptive subcarrier allocation
- Integration of Hybrid ARQ for front-line security enhancement
- Real-time implementation of the above in ArgosV3-based POWDER platform



IOTWeek

Dublin — June 20-23, 2022

Thank you!

Find more:

G. Karystinos, gkarystinos@tuc.gr

D. Pados, dpados@fau.edu

iotweek.org