Cybersecurity in Unmanned Autonomous Systems (UAS)/Robotics: Public Perception of UAVs and Autonomous Vehicles

RET Robotics Module

This research is supported by Award #1542465:
RET Site: Cyber Security Initiative for Nevada Teachers (CSINT)
Robots and Cybersecurity?
Major concerns with robotics and security

Privacy:

Robots are mobile sensing platforms.

What gets done with those data?

How is that sensing perceived?

Data Security:

Data are transmitted wirelessly, how to secure data, while also allowing robot to function quickly?

Who is allowed to know information that robot knows, how can it be securely transmitted?
Robots in our lives
Google Glass
Glasshole

Google Glass Is Banned On These Premises
No Surveillance Devices
Topics Covered

➔ Public Perception of Technology
➔ Survey Design
➔ Behavior Studies
➔ Paper Preparation/Publication
Lab Activities

➔ To help teachers learn about robotics and cybersecurity, they will participate in in-progress lab activities
  ◆ HRI studies
  ◆ UAV piloting (where appropriate)
  ◆ Data analysis
  ◆ Literature review (as part of their module activities)

➔ Teachers will develop and conduct their own survey study
  ◆ Only lab activity that could conceivably be completed in 4-week period
  ◆ Work will be supported by graduate students/undergraduates experienced in conducting such studies
Public perception of technology is shaped by incomplete and prejudicial information about that technology

- News reports
- Personal Biases
- Exaggerated capabilities of technology
What might affect perceptions?

➔ Recognizable equipment on UAV
  ◆ Camera/recording equipment
  ◆ Weaponry
  ◆ Public safety/government identifiers

➔ Connotations of news coverage regarding UAVs
  ◆ Word choices
  ◆ Danger coverage/Public interest stories
  ◆ Videotaped reactions

➔ Knowledge of laws related to unmanned flight
Module goal: test some of these factors

- Construct “news coverage” or “public disclosures” of UAV activity
- Use survey studies of general public
  - via Mechanical Turk or other distributed survey methods
  - Ask questions related to perceptions of that particular UAV
  - Perceptions of UAVs in general
  - UAVs in their own life
- Develop recommendations for public disclosure of UAV-related information
- Target for publication in AUVSI
What you might bring back to classroom

➔ Increased knowledge of experimental method
  ◆ Behavior studies
  ◆ Survey studies
  ◆ Analysis and discussion of results

➔ Knowledge of robotics and cybersecurity
  ◆ Types
  ◆ Forms
  ◆ Capabilities/Limitations
  ◆ Uses in daily life

➔ Knowledge of academic research process
  ◆ BS->MS->PhD Pipeline
  ◆ Paper publication timeline
Related Supported Projects


To do when you get in on Tuesday

The Human-Robot Interaction work going on in the RRL involves many experiments involving human participants.

Since you will be dealing with human participants, I recommend taking the UNR Research Integrity Office training course:

http://www.unr.edu/research-integrity/training/study-training
Optional Prep