

DETECTION OF CONCEALED THREATS ON PEOPLE IN UNCONTROLLED PUBLIC SPACES AND IN BAGS/CONTAINERS

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AFFILIATIONS:

RADIO- PHYSICS + XPCI TECHNOLOGY

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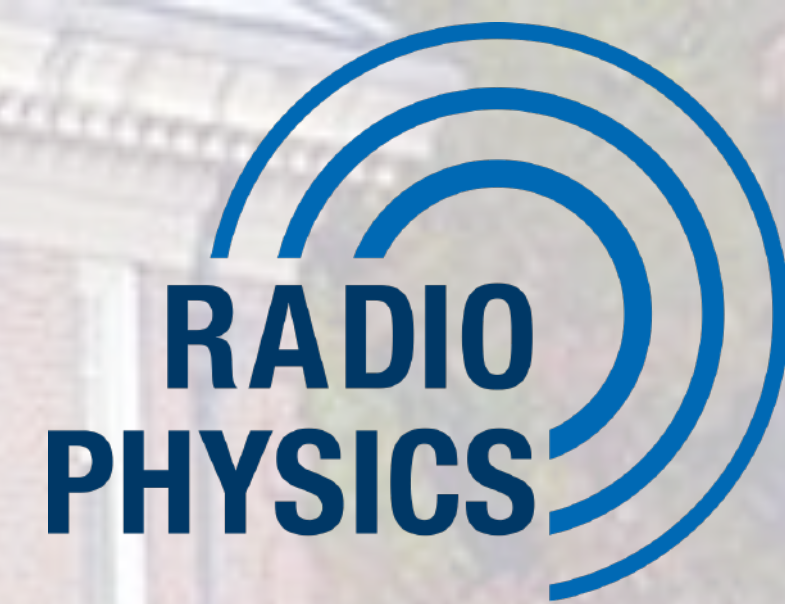
ON PEOPLE IN PUBLIC SPACES



IN BAGS/ CONTAINERS

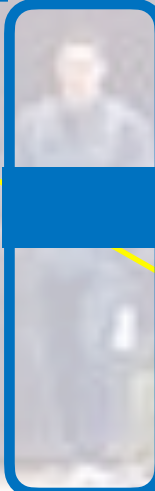


RADIO-PHYSICS ALARMS ON CONCEALED THREATS IN UNCONTROLLED PUBLIC SPACES



1. **SPACE** STAND-OFF CONCEALED THREAT DETECTION
2. **PROBLEM** RESPONDERS DO NOT KNOW IF AND WHEN THERE IS A THREAT
3. **SOLUTION**
 - SCAN CROWS FOR PERSON BORNE CONCEALED THREATS IN UNCONTROLLED PUBLIC SPACES
 - SEND ALARM TO RESPONDERS VIA CLIENT OR MOBILE DEVICES.
4. **RESULTS**
 - 95%+ DETECTION RATES; 0.1% FALSE POSITIVE RATE TARGET
 - DEPLOYED IN MULTIPLE COUNTRIES. HOTEL COMPLEX REMOVED ALL OTHER PEOPLE SCANNING DEVICES
5. **TRL**
 - 9.8. SCHEDULED JHUAPL TESTING WITH US NAVY AND TSA IN Q2 2021
 - WORKING ON DEPLOYMENTS FOR US SCHOOL, STADIA AND HOSPITALITY

**THREAT DETECTED
AT 100 FEET
FROM ENTRANCE**



XPCI TECHNOLOGY DETECTS CONCEALED THREATS IN BAGS/CONTAINERS

XPCITE

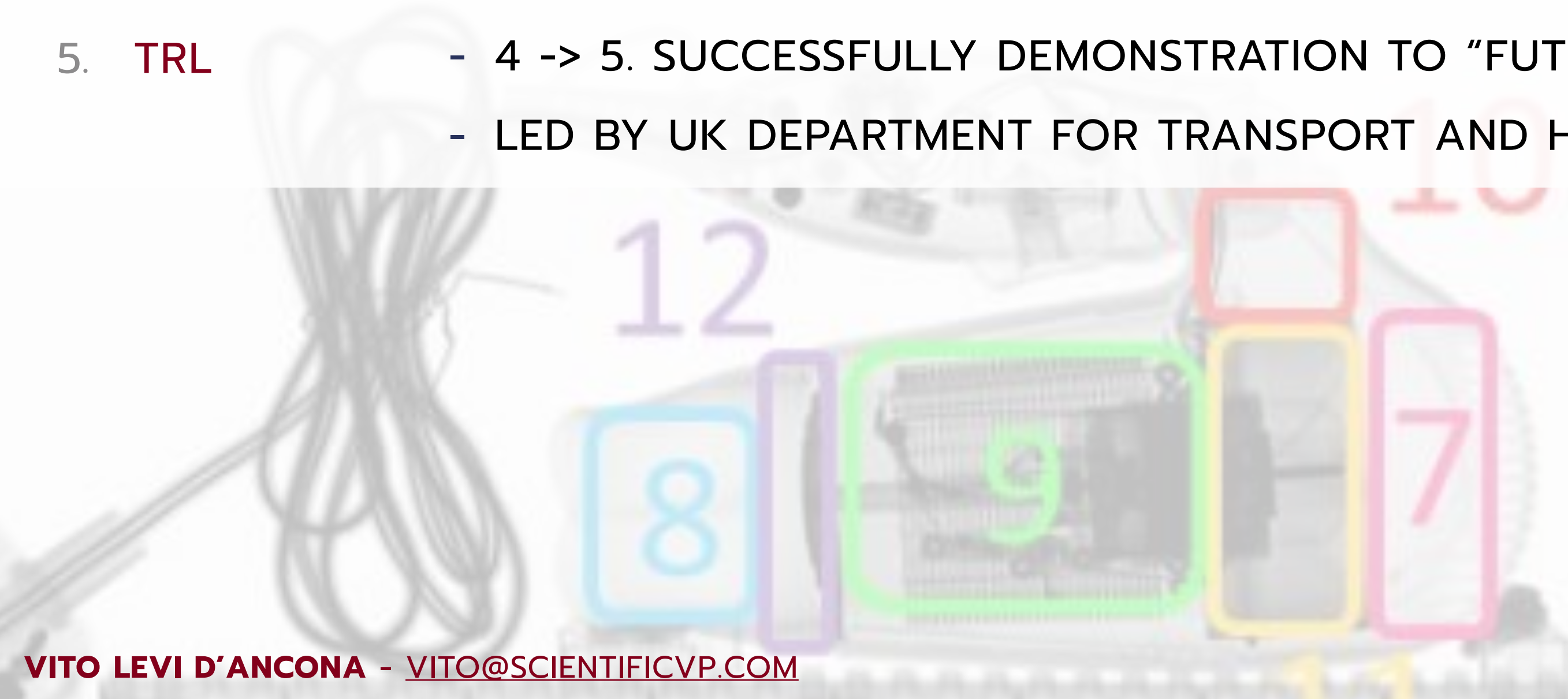
1. **SPACE** COUNTER SMUGGLING OF THREAT MATERIALS/CONTRABAND HIDDEN IN EQUIPMENT CONTAINING CLUTTER
2. **PROBLEM** EXISTING SOLUTIONS (SCATTERING OR X-RAY DIFFRACTION) HAVE LOW THROUGHPUT
3. **SOLUTION**
 - DNN DEEP LEARNING APPLIED TO X-RAY PHASE CONTRAST IMAGING DEVICES ACHIEVES HIGH THROUGHPUT
 - FLAG SUSPICIOUS OBJECTS OF INTEREST AUTOMATICALLY TO SECURITY PROFESSIONALS
4. **RESULTS**
 - 100% TRUE POSITIVES, 17.5% FALSE POSITIVES IN AIRPORT TRIALS
 - 1'58" VS 8'45" AIRPORT REVIEWERS (ON 80 TARGETS). 3 VS 1 IMAGE/TARGET HUMAN OPERATOR
5. **TRL**
 - 4 -> 5. SUCCESSFULLY DEMONSTRATION TO "FUTURE AVIATION SECURITY SOLUTIONS" (UK GOV).
 - LED BY UK DEPARTMENT FOR TRANSPORT AND HOME OFFICE

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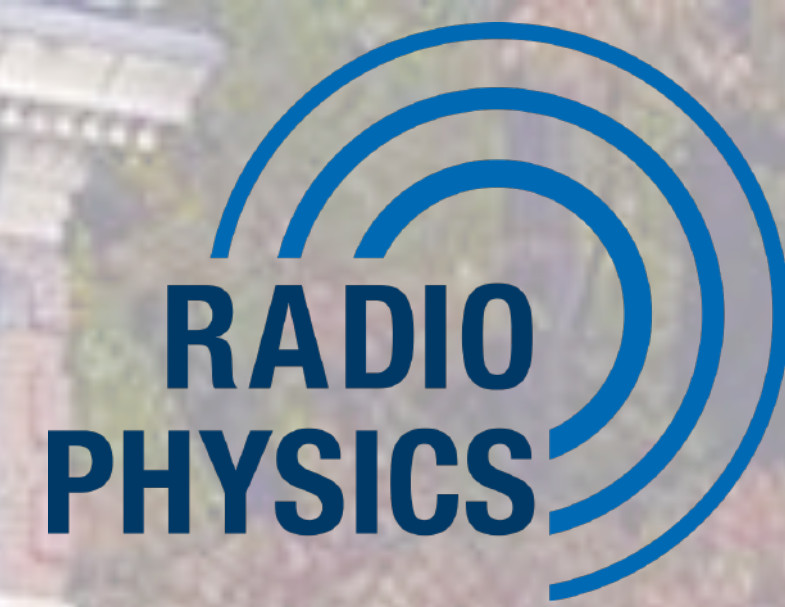
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TECHNICAL APPENDIX

RADIO-PHYSICS ALARMS ON CONCEALED THREATS IN UNCONTROLLED PUBLIC SPACES



- RADAR, VIDEO AI & LIDAR SENSORS MAP OUT SECURE AREAS
- 71-86GHZ POLARIMETRIC RADAR AUTOMATICALLY SCAN CROWDS IN UNCONTROLLED PUBLIC SPACES
- SYSTEM SENDS ALARMS ON CONCEALED THREATS (I.E. BOMBS, GUNS, KNIVES) AT 100+ FEET FROM EACH SENSOR TO RESPONDERS VIA CLIENT OR MOBILE DEVICES

A diagram illustrating a security system. A sensor is mounted on a building, emitting yellow lines that represent a scanning beam. These lines cover a crowd of people walking on a sidewalk. A white box with a blue border is positioned above the crowd, containing the text "THREAT DETECTED AT 100 FEET FROM ENTRANCE". Several individuals in the crowd are highlighted with blue rectangular boxes. The background shows a brick building with windows and a grassy area.

**THREAT DETECTED
AT 100 FEET
FROM ENTRANCE**

A VIRTUAL ASSISTANT COMBINES X-RAY PHASE CONTRAST IMAGING WITH DEEP LEARNING

XPCITE

- XPCI: 10,000X MORE SENSITIVE THAN OTHER REFRACTIONS (ANGLES OF REFRACTION < 1,000TH OF A DEGREE). X-RAYS UNDERGO REFRACTION SIMULTANEOUSLY, ACHIEVING A HIGH THROUGHPUT. WE ANALYZE EVERY PHOTON
- DNN: AUTOMATES DISAMBIGUATION, IMPROVING RELIABILITY OF THREAT ALERTS
- VA: SUPPORTS SECURITY PROFESSIONALS BY COMPARING SCANNED IMAGES AGAINST A DNN MODEL THAT CONTAINS THREAT SIGNATURES, FLAGGING UP SUSPICIOUS OBJECTS OF INTEREST

