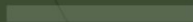




DEFENCE



Battlefield of Things 3: Trench EW Hackathon



EPS 10



INNOVATION FOR DEFENCE

VERHAERT | MASTERS IN INNOVATION



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What to bring along

(components)

We'll provide some components for you to use during the event (next few slides) as well as basic things you need for work - paper, markers, sticky notes - but you might want to bring along other things as well to make sure you have your familiar tools with you and don't have to wait:

- Basic tools: standard screwdriver kit, a multi-tool (Leatherman, etc.), callipers, hot glue gun, etc. and any other tools you might need.
- Your favourite soldering kit (iron, clamp, tweezers, wire cutters, 3rd hand, etc.)
- LED lights and magnifying glasses
- Pens / pencils and note paper of your choice
- Anything you might want to use to decorate your workspace and your prototypes (why not?): NeoPixels, other LED lights, etc.
- USB sticks and SD cards (including micro-SD cards), as well as SD card readers (we'll have those, but you can't ever have too many)
- Video adaptors from your computer to HDMI (in case your computer will be used for a presentation)
- A spare power extension cable - again, we'll have plenty, but you never know!
- 12-volt adaptors
- Cables: USB data cable, micro-USB, USB Type C, USB power hubs, etc.

And, while we'll have quite a few components available, you can always bring along any other components you want to experiment with!

We'll provide

Boards	Maker	Model	Quantity*
Raspberry Pi PICO	Raspberry Pi	Raspberry Pi Pico W - RP2040	5
ESP 32	Expressif	ESP32-C6-DevKitC-1-N8	40
Raspberry Pi Model B	Raspberry Pi	RPI4-MODBP-4GB	10

Sensors and Radio	Maker	Model	Quantity
Accelerometer	TDK	MPU6050	10
Seismic	TE	MiniSense 100NM	20
Temperature	TI	LM75	10
Light	Silicon Labs	Si1145	10
Humidity	Sensirion	SHT45	10
PIR sensor - used in motion-activated lights (Passive Infra Red sensor)	Varioius	HC-SR501	20
Microwave radar	MH-ET	HB100 Microwave Motion Sensor 10.525GHz Doppler Radar Detector	10

Ultrasound piezo sensor	Various	HC-SR04	10
I2S microphone (50Hz-15kHz)	Speed Studio	101020852	10
CO2 levels detector	Sensirion	SGP30 TVOC and eCO2 Sensor Module	10
Full-featured thermal cameras	Pimoroni	PIM366	4
GNSS		ATGM336H GPS Module	10
LoRa	Dragino	LSN50-V2 Waterproof Long Range Wireless LoRa Sensor Node	2
AI Accelerator K210	-	-	10
NRF24L01 + Antenna - 1000m wireless comm	-	-	20
LD2420-24G - Radar human presence	-	-	10
JDY-40 2.4G Wireless Serial Port Transmission Transceiver	-	-	20
ESP32-C3 Development Board	-	-	20
Orange Pi Zero2 - 1GB	-	-	8
Raspberry Pi Compatible Cam - 5MP	-	-	10

Other components	Maker	Model	Quantity
18650 battery cells	-	3.7 V / 2.6 Ah	40
18650 battery holders - single	-	-	15
18650 battery holders - double	-	-	15
CR 2032 batteries	-	-	20
CR 2032 holder	-	-	15
Lead-acid battery	-	7Ah	5
Micro SD cards (cheapest found)	Kingston	32 GB MicroSD Micro SD Card, Class 10, UHS-I	40
Micro SD card readers	Hama		20
HackRF	Scott	HackRF One - SDR	2
Vector Analyser	URSINC	NanoVNA-F V2 Vector Network Analyzer 50KHz-3GHz HF VHF UHF VNA 4.3" Analyzer Antenna	1
Level shifter (3V3 to 5V ⇔ 5V to 3V3) on a breakout board	-	-	20
USB Lipo Charger	-	-	20
Step UP 3.7 to 5V-28V	-	-	30
LiPo batteries	-	EJ606090 3.7V 4000mAh	30
LED lights RGB	-	-	30



Cables	Maker	Model	Quantity
USB cables	-	USB to micro USB	3 packs
		USB to USB C	4 packs
Ethernet cables	-	.5 meters	5
		5 meters	3
		10 meters	1

Summary of RF-tools

- Rhode & Schwarz FSQ 26 spectrum analyzer
- Tektronics RSA306B Real-Time Spectrum analyzer
- Agilent MXA Real-Time Spectrum analyzer
- 2 + 7 BladeRF SDR
- 1 Kraken SDR
- 1 HackRF
- 2 Jammers (20MHz to 6GHz)

Equipment Provided By our Knowledge Partners

Thank you!

ALX Systems will bring along:

Hardware:

- 3 drones (2 open/unsecured, 1 secured for comparison)
- 10x serial GPS modules
- 20x USB sub-GHz radios (315-916 MHz)
- 4x LTE modules (4G Cat.6)

Use cases for participants:

- GPS jamming and resilience testing
- Communication interception and analysis
- Drone system vulnerability exploration
- Development of anti-jamming and RF resilience solutions
- Prototyping and testing additional EW concepts

Senhive will bring along:

Hardware:

- 7x Software Defined Radios (bladeRF 2.0 micro, 47 MHz - 6 GHz)
- Antennas for 2.4 GHz / 5 GHz / 900 MHz
- Coaxial cables & RF adapters
- Use cases for participants:

Use cases for participants:

- Signal interception and spectrum analysis
- RF protocol exploration and reverse engineering
- Wireless communication testing across multiple frequency bands
- Development of jamming and anti-jamming techniques
- Prototyping and testing custom RF-based solutions

Citymesh will bring along:

Hardware:

- Rohde & Schwarz TSMA6 + ROMES (Field equipment): a passive scanner supporting 0 to 6 GHz.
- VIAVI ONA800 (Field equipment) passive scanner supports 9 kHz to 44 GHz.
- VIAVI TM500 RF Device emulator (lab equipment) simulates the load of up to 256 RF devices and allows controlled mobility scenarios

Use cases for participants:

- Field network performance mapping and optimization
- Interference detection and spectrum analysis
- Root-cause investigation of connectivity and quality issues
- Load testing and network behavior under high user density
- Mobility and handover scenario testing in controlled environments
- Validation and prototyping of network optimization strategies

Thank you!