

**CEA**

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## Targeted topics

*Please choose from the list below 3 topics, at maximum.*

*Remove then the rows corresponding to the non-selected topics in order to highlight your selection*

SU-INFRA01-2018-2019-2020	Prevention, detection, response and mitigation of combined physical and cyber threats to critical infrastructure
SU-DRS02-2018-2019-2020 subtopic 1	Technologies for first responders - subtopic 1: Victim detection technologies
SU-FCT03-2018-2019-2020	Information and data stream management to fight against (cyber)crime and terrorism
SU-BES02-2018-2019-2020 subtopic 1	Technologies to enhance border and external security - subtopic 1: Providing integrated situational awareness and applying augmented reality to border security
SU-BES02-2018-2019-2020 subtopic 2	Technologies to enhance border and external security - subtopic 2: Detecting fraud, verifying document validity, and alternative technologies to identifying people

# Artificial Intelligence

- *N2D2 is an **open source** Framework for **exploration and generation** of optimized **deep neural network**- Allows to benchmark COTS Hardware (GPUs, CPUs,..) and select the right one for the targeted application*
- *PNEURO is a programmable energy-efficient hardware accelerator designed for DNN – Applicable to all types of NN applications- Performances on video FPGA compared to NvidiaTK1 are X2 faster, X4.5 more energy efficient- On ASIC: X7 faster, X200 more energy-efficient*
- *Library of dedicated IPs*
- *Applicable to following calls:*
  - **SU-BES02-2018-2019-2020 sub-topic2 (alternative technologies to identifying people)**
  - **SU-FCT03-2018-2019-2020 (use of Artificial Intelligence for analyzing big data)**

# Smart Camera & Image processing

- *Target: embedded smart systems embarking pre-processing*
- *Optimisation and porting embedded applications*
- *High performance optical sensors integrating pre-processing*
- *Can be coupled to VR and our Artificial Intelligence solutions*
- *Applicable to following calls:*
  - **SU-BES02-2018-2019-2020 sub-topic1 (highly-standardized interfaces showing real-time information in a user-friendly way)**- Use of smart glasses to analyse in Real time images in the direction of the eyes- can be coupled to VR
  - **SU-DRS02-2018-2019-2020: Technologies for first responders (victim detection)**- We have developed a solution for pedestrian detection for construction machines
  - **SU-FCT03-2018-2019-2020 (use of Artificial Intelligence for analyzing big data)**. Detection of abnormal behaviors in real time using smart camera + PNeuro

# Cybersecurity

- *Data protection*
  - High performance lightweight cryptography
  - Homomorphic encryption (computing on encrypted data)
  - Detection of cyber-attacks in IoT (Monitoring and light-weight machine learning techniques)
- *Code protection*
  - Software countermeasures against side-channel attacks (code polymorphism, fault detection )
  - Countermeasures against fault-injection attacks (detection of integrity violations)
- *HW protection*
  - Secure hypervision with ARM trustzone
  - Many-core systems safety (interference-free cohabitation of mixed critical applications)
- *Applicable to following calls*
  - **SU-INFRA01-2018-2019-2020** (Prevention, detection, response and mitigation of combined physical and cyber threats to critical infrastructure)
  - **SU-FCT03-2018-2019-2020** (information and data stream management to fight against cybercrime and terrorism).