This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 883297.
How can a LEA be familiarised with AR technology and how we can train specific profiles to introduce them in this framework?
| OBJECTIVE 1 | Realize training of technologically non-expert LEA end-users in the use of the DARLENE WECN devices and interfaces decision support, while enhances European cities resilience, without compromising citizens’ fundamental rights and privacy. |
| OBJECTIVE 2 | Implementation of training workshops and seminars at EU level as a basis to encourage exchange of expertise, sharing and collaboration among LEA training centres across Europe within a joint security network in using the DARLENE tools and applications to co-create and modify training methods and scenarios. |
| OBJECTIVE 3 | To train instructor trainers of DARLENE WECN users in order to organize the pilot demonstrators and to train external end-users. |
| OBJECTIVE 4 | To inform both internal and external LEAs on the technological merits, innovation and competitive advantages provided by the DARLENE system, and in doing so, gather valuable feedback. |
Introduction

**DARLENE: SITUATIONAL AWARENESS + ADVANCED TECHNOLOGY**

DARLENE will employ REAL-TIME SA enhancing technologies based on AR/AI

EXECUTING OODA LOOPS DURING INCIDENTS

1 STEP AHEAD OF TERRORISTS AND OTHER POTENTIAL ADVERSARIES

OODA

1. Observe
2. Orient
3. Decide
4. Act

Agility over Brute Force
Introduction

1. **WECN/PCEN**
   - DARLENE Wearable/Police Car Edge Computing Node (WECN/PCEN)

2. **DARLENE ML Cloud**
   - 5G new radio (5G NR), radio access network (RAN), edge/fog computing, network functions virtualization (NFV), context-aware services, network slices management and orchestration (MNO), computation offloading

3. **Command & Control**
   - 3D Mapping technologies, 3D reconstruction of indoor spaces from multi-RGB input, 3D rendering...

4. **DARLENE LEA Services**
   - “X-Ray” Identification Friend or Foe technology, Augmented Surveillance

5. **Adaptive visualization**
   - Online/offline adaptation, adaptive and adaptable visualisation features...

6. **Multi-modal AR interaction framework**
   - Recognition and monitoring of user interaction, distributed processing, reasoning mechanisms, computer, sensor and actuator networks, computer vision algorithms, voice recognition, hands gesture..
Introduction

WP6 8,1% (72PMs)

WP6 contributors

WP6 leader

8PMs YBQ 11,11%
12PMs KEMEA 16,67%

7PMs ERTZ 9,72%

13PMs PLV 18,06%

5PMs LP 6,94%

5PMs PJ 6,94%

4PMs HfoeD 5,56%

4PMs KUL 5,56%

2PMs CERTH 2,78%
**DARLENE elements: IA, AR**

Showcasing DARLENE solutions utilized in various contexts

**a)** - Segmenting and enhancing officer SA

**b)** - Identification friend-or-foe technology, for officer planning action behind cover
a). Crisis management and healthcare provision after cyber-attack or terrorist incident

b). Criminal/terrorist apprehension

b). Possible explosives threat neutralization

Showcasing LEAs capacities using DARLENE solutions in Use Case #1 (Larnaca Int. Airport)
Showcasing LEAs capacities using DARLENE solutions in Use Case #2 (Markopoulos training facility)

a). Demonstrates armed perpetrator holding hostage, occurring on the other side of the wall.

b). Shows how security camera feed is used to determine the pose of the two individuals, the direction the weapon is pointing and a color coded skeleton visualization.

c). Shows actual view from the DARLENE AR wearable headset, showcasing data even while through the solid wall.
Planning and progress

Start month: 5 (Jan’21)  End month: 36 (Aug’23)

Tasks
- **T6.1:** Training, planning and demonstration
- **T6.2:** Workshop and seminar organization
  - **T6.2.1:** Training of Trainers (ToT) of partner end-users’ instructors
  - **T6.2.2:** Training of LEA end-users and stakeholders in each country
- **T6.3:** External LEA feedback

Deliverables
- **D6.1 & D6.2 (M12 & M25):** DARLENE platform handbook and tutorial content
- **D6.3 & D6.4 (M22 & M36):** Training evaluation report 1st and 2nd version
- **D6.5 (M36):** Training of LEA end-users and stakeholders report
- **D6.6 (M36):** External LEA feedback evaluation report

Milestones
- **MS11:** Training of Trainers completed  (M24)
Planning and progress

Start month: 5 (Jan’21)  End month: 25 (Sep’22)

**DESCRIPTION**

Planning and preparation of training activities, which will include:

- **Revising and detailing** the exact timing and scheduling, technical contents, identifying lectures/instructors, trainees and methodology of each work session in face-to-face, remote and evaluation workshops and seminars in the end-user partner countries
- Checking and arranging the necessary logistics

**Leader & contributors**

Leader: PLV  
Contributors: CERTH, KUL, KEMEA, YBQ, ERTZ, PJ, HfoeD, CP, LP

**Deliverables**

D6.1 (M12): DARLENE platform handbook and tutorial content – 1st version
D6.2 (M25): DARLENE platform handbook and tutorial content – 2nd version
Training preparation will further include:

a) A DARLENE WECN device handbook and tutorial, consisting of a **printed manual and interactive software** to be distributed to instructors, trainees and interested users as both a PC and mobile application (D6.1)

b) A DARLENE prototype tutorial kit to be set up within the premises of target partner end-users in order to launch training sessions (D5.X)

c) An off-line self-evaluation **form** to be filled by trainees and end-users for feedback gathering, possible system improvement and customization

d) **Web and printed informative material** for the presentation of the training workshops and seminars

* During this Task, the DARLENE partners will produce the different training material of the DARLENE technology having regard of legal procedures, privacy and ethical principles
### Planning and progress

#### Start month: 7 (Mar’21)  
#### End month: 36 (Aug’23)

#### DESCRIPTION

This Task will deal with the main activities focused on training, which will consist of two phases, handled as sub-tasks (T6.2.1, T6.2.2)

#### Leader & contributors

**Leader:** KEMEA  
**Contributors:** CERTH, KUL, PLV, YBQ, ERTZ, PJ, HfoeD, CP, LP

#### Deliverables

- **D6.3 (M22):** Training of LEA end-users and stakeholders report – 1st version
- **D6.4 (M36):** Training of LEA end-users and stakeholders report – 2nd version
WP6: overview

Starting month: 5 (Jan’21)  Ending month: 36 (Aug’23)

**Tasks**
- **T6.1:** Training, planning and demonstration
- **T6.2:** Workshop and seminar organization
  - T6.2.1: Training of Trainers (ToT) of partner end-users’ instructors
  - T6.2.2: Training of LEA end-users and stakeholders in each country
- **T6.3:** External LEA feedback

**Deliverables**
- **D6.1 & D6.2 (M12 & M25):** DARLENE platform handbook and tutorial content
- **D6.3 & D6.4 (M22 & M36):** Training evaluation report 1st and 2nd version
- **D6.5 (M36):** Training of LEA end-users and stakeholders report
- **D6.6 (M36):** External LEA feedback evaluation report

**Milestones**
- **MS11:** Training of Trainers completed  (M24)
WP6: roadmap

Start month: 5 (Jan'21)
End month: 36 (Aug'23)
WP6: roadmap

Deliverables

**D6.1 & D6.2 (M12 & M25):** DARLENE platform handbook and tutorial content
**D6.3 & D6.4 (M22 & M36):** Training evaluation report 1st and 2nd version
**D6.5 (M36):** Training of LEA end-users and stakeholders report
**D6.6 (M36):** External LEA feedback evaluation report

Milestones

**MS11:** Training of Trainers completed (M24)

1st YEAR OF LIFE

2021

DEC 04
JAN 05
FEB 06
MAR 07
APR 08
MAY 09
JUN 10
JUL 11
AUG 12
SEPT 13

T6.1

T6.2

T6.3

2nd Qtly
3rd Qtly
4th Qtly
5th Qtly

DARLENE platform handbook and tutorial content
**[WP6] WP6: Progress & status**

- **T6.1**: Continuous work regarding planning of activities
- **T6.2**: Planning of the T6.2.1 and T6.2.2, regarding ToT and working in the D6.1
- **T6.3**: Gathering ever feedback that is provided in both dissemination and workshop event (i.e. Bilbao and València events)
[WP6] WP6: Progress & status
WP6 Task Leaders (end-users) meeting

In order to discuss WP6 terms, the task leaders and end-users (ERTZ and PLV) planned a face-to-face meeting in June 2021, which has been carried in July.
[WP6]: BILBAO event

Date: July. 14th, 2021

Partners:
Thanks to Mr. Pietru and Mr. Antonio (YOUBIQUO), all the technical details of the solution were described, as well as the main functionalities, to an audience of 30 people, from the most representative areas of the BRIMO.
[WP6]: BILBAO event

- The event was held in July, 14\textsuperscript{th} 2021 in the HQ of the BRIMO (ERTZAINZTA) in Iurreta (Bilbao)

- Thanks to the combined effort of ERTZ-YOUBIQUO-PLV we received a fruitful feedback from the involved police officers (11 questionnaires)
Both ERTZAIN TZA and PLV presented the project, introducing the main activities within the WP6, in order of putting in situation about the ToT and the workshop that has to be held following the T6.2.2 content.
[WP6]: BILBAO event

Date:
July 14th, 2021

Partners:
- The ergonomy, dimensions and weight were tested, as well as beta functionalities, during an exercise carried out by several BRIMO (ERTZ) police officers.

- All was recorded, and once the permissions had been approved we will share all multimedia material with the consortium.

- Thanks to the combined effort of ERTZ-YOUBIQUO-PLV we received a fruitful feedback from the involved police officers (11 questionnaires).
From PLV, we have organized a combined event in which VR glasses (from a company called “LAST MONKEY”) and DARLENE will be presented to a specialized audience, mainly LEAs.
- LAST MONKEY works only in VR, addressed to train police officers; they don’t work in AR, so the combined event seems to be very attractive to LEAs and a good opportunity for a dissemination event.
- Although at an early stage, from PLV we think that it could be a great opportunity to show our advances.

- The attendance of the partners of the consortium will be more than welcome; YOUBIQUO has confirmed their attendance and also ERTZAINZTA.

- The event is thought to be carried out in a morning shift, at the PLV HQ.

- The expected audience, always depending on the COVID-19 situation, is between 60 – 80 people, and external audience will be invited.
[WP6] WP6: Progress & status
Jornada sobre nuevas tecnologías aplicadas a las FFCCS
Proyecto Europeo DARLENE (Realidad Aumentada)
Simulador Táctico OCTOPUS (Realidad Virtual)
Organiza: Sección de Proyectos Europeos – Policía Local de València.

https://twitter.com/policialvalvc/status/1448558520278913026?s=20&t=sqP4C2Y5vNc9FATVhjUUwQ
[WP6] WP6: Progress & status
[WP6] T6.1: Next steps

First:
Recruitment process (Methodology, criteria)

Second:
Logistics (Areas, pictures)

Third:
Calendar (Preferences)

Fourth:
Stakeholders/Network (Expected list)

Fifth:
SOTA (solution)
[WP6] T6.1: Next steps

Date: Sept (mids), 2021

(3rd TLM) Partners:

(WP6 meeting) Partners:

- Among the WP6 task leaders, the progress of the WP6 tasks will be discussed, as well as the next steps to be taken.

- Within the WP6 meeting, we will analyse the recruitment of trainers done and the planning of the ToT

- The requirements of YOUBIQUO, regarding which ecosystem will need the solution from each end-user, will be also analysed.
[WP6] WP6: Progress & status
WP6: Progress & status
[WP6] WP6: Progress & status
[WP6] WP6: Progress & status
[WP6] WP6: Progress & status
[WP6] WP6: Progress & status
[WP6] WP6: Progress & status
[WP6] WP6: Progress & status
T6.3: External LEA feedback

Start month: 7 (Mar’21)  End month: 36 (Aug’23)

DESCRIPTION

- After the end of T6.2.2 -> Each end-user partner will report on its action and the feedback received from external end-users and stakeholders.
- The project team will collect the end-user partners’ reports in order to elaborate an external LEA evaluation report.
- The external LEA evaluation will be analyzed and discussed by the project team in a one-day workshop to be held in one of the LEA partners’ country.

Leader & contributors

Leader: ERTZ
Contributors: PLV, KEMEA, PJ, HfoeD, CP, LP

Deliverables

D6.5 (M36): Training of LEA end-users and stakeholders report
D6.6 (M36): External LEA feedback evaluation report
## T6.3: External LEA feedback

<table>
<thead>
<tr>
<th>Start month: 7 (Mar’21)</th>
<th>End month: 36 (Aug’23)</th>
</tr>
</thead>
</table>

### PARTNERS INVOLVED IN TASK 6.3

<table>
<thead>
<tr>
<th>Short name of participant</th>
<th>KEMEA</th>
<th>ERTZ Task leader</th>
<th>PJ</th>
<th>HfoeD</th>
<th>PLV WP leader</th>
<th>CP</th>
<th>LP</th>
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<td>2</td>
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<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

**MMs in T6.3 Total 17**
T6.3: External LEA feedback

WRITTEN ON THE PROPOSAL:

After the implementation of sub-task 6.2.2, each end-user partner will report on its action and the feedback received from external end-users and stakeholders. Reports will include the contacts activated with other LEAs and stakeholders, their comments, suggestions and interest toward the prototype platform. The project team will collect the end-user partners’ reports in order to elaborate an external LEA evaluation report, which will be jointly discussed and analysed by the project team in a one-day workshop to be held in one of the LEA partners’ country. The analysis will highlight possible system improvements, customization and enhancement of commercialization and dissemination opportunities.
T6.3: External LEA feedback

NEXT STEPS:
- Finish all the recopilation of inputs performed by KEMEA regarding:
  - AR product visualisations: 3 options
  - police patrol car
  - Short questionnaire to select the Graphical User Interface components that should appear in the AR glasses (ranking of components).
  - Short questionnaire to distribute among our experts (12 responses each LEA) for the identification of End User requirements for the development of user friendly and effective applications (functionalities).
  - One to one evaluation sessions for the preliminary evaluation of the DARLENE decision-making algorithm results.
T6.3: External LEA feedback

- Putting together inside the consortium all the results of the previously mentioned open processes.
- Decide which of the results share with external LEAs and stakeholders and in which aspects their feedback is more relevant.
- Open questionnaires to external Leas and stakeholders and gather their inputs.
- Work on tasks 6.2.1 (ToT) and 6.2.2 (Training of LEA end-users and stakeholders in each country)
Deep AR Law Enforcement Ecosystem

Training Workplan

DARLENE Stakeholder Board workshop

This project has received funding from the European Union’s Horizon 2020 Research and Innovation programme under Grant Agreement No 883297.
WP6 Breakdown

WP6 - LEA Training Activities

T6.1 Training planning and demonstration

T6.2 Workshop and seminar organization

T6.2.1 Training of Trainers (ToT)

T6.2.2 Training of LEA end-users and stakeholders in 5 countries

T6.3: External LEA Feedback

F2F ToT

+ Remote/Virtual W/shop

+ Joint Evaluation W/shop
Task Interdependencies

WP6 - LEA Training Activities

T6.1 Training planning and demonstration

T6.2 Workshop and seminar organization

T6.2.1 Training of Trainers (ToT)

F2F ToT

+ Remote/Virtual W/shop

+ Joint Evaluation W/shop

T6.2.2 Training of LEA end-users and stakeholders in 5 countries

T6.3: External LEA Feedback

Group /F2F w/shop evaluation per country (0.1 d)

E-learning material

2d physical w/shop

1d w/shop
## T6.2.1 Training of trainers (2D workshop + evaluation)

### Day-1 DARLENE Seminar

<table>
<thead>
<tr>
<th>#</th>
<th>Presentation Focus</th>
<th>Training Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DARLENE overview and Value added for LEAs</td>
<td>1-1.5</td>
</tr>
<tr>
<td>2</td>
<td>Legal challenges and DARLENE safeguards</td>
<td>0.5-1</td>
</tr>
<tr>
<td>3</td>
<td>WECN &amp; SG glasses</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>DARLENE Functionalities</td>
<td>2</td>
</tr>
</tbody>
</table>

### Day-2 DARLENE Guided experienced workshop

<table>
<thead>
<tr>
<th>#</th>
<th>Presentation Focus</th>
<th>Training Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overview of DARLENE Toolkit</td>
<td>0.5</td>
</tr>
<tr>
<td>2</td>
<td>HANDS on sessions with Local scenarios</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Workshop Evaluation w/ survey</td>
<td>0.5</td>
</tr>
</tbody>
</table>
i. DARLENE Project Overview

ii. DARLENE Objectives \ Benefits to LEAs

iii. DARLENE Architecture overview and use of technologies (AI, ML, AR, Edge Computing, 5G, ....)

iv. DARLENE Functionalities

1. Situational Awareness
2. Identification (Persons, Objects,...)
3. Detection (Persons, Objects, Situation, Behaviour,...)
4. Mapping (Location, distance to target, Use of blueprints,...)
5. Navigation (Optimal route to incident,...)
6. Assist/support decision making (Priority actions, Decision Trees, ...)
7. Command and Control Operations - Overview
8. Communication utilities (Between Law Enforcement agents, etc.)
Day-2 Detailed

i. Introduction to DARLENE prototype Tutorial Kit (DpTK)

ii. Experience with DpTK on
   1. Situational Awareness
   2. Identification (Persons, Objects....)
   3. Detection (Persons, Objects, Situation, Behaviour....)
   4. Mapping (Location, distance to target, Use of blueprints....)
   5. Navigation (Optimal route to incident,....)
   6. Assist/support decision making (Priority actions, Decision Trees, ...)
   7. Command and Control Operations
   8. Communication utilities (Between LE agents, etc.
   9. UC on Crisis Management & health care provisioning
   10. UC on suspect apprehension
   11. UC on explosive neutralization
   12. UC on neutralization of perpetrators in public spaces

   • At the end of the second day a Debriefing & Evaluation session should take place
Remote/Virtual W/shop

- From the material presented in the Physical meetings
- From the feedback provided at the end of each physical training e-learning material will be produced.
- The material and the feedback provided will be used to produce e-learning classes for the trained Trainers who will teach/present DARLENE solution to affiliated LEAS.
E-learning Structure (1/3)

Introduction
a) DARLENE Project Overview
b) DARLENE Objectives and Benefits to LEAs
c) DARLENE Architecture overview and use of technologies (AI, ML, AR, Edge Computing, 5G, others, ...)
d) Ethics and Legal considerations for AR in LEA environment

Technologies & Applications
a) Augmented Reality
b) 3D Mapping
c) 5G / Edge Computing
d) Machine Learning
e) Wearable sensors
E-learning Structure (2/3)

DARLENE Functionalities (LEA Services)

a) Active/Few-shot Learning
b) "Multi-person 2D/3D pose estimation in real time"
c) Real-time semantic/instance segmentation
d) Situational Awareness
e) Identification (Persons, Objects, etc.)
f) Detection (Persons, Objects, Situation, Behaviour, etc.)
g) Mapping (Location, distance to target, Use of blueprints) 
h) Navigation (Optimal route to incident, ....)
i) Assist/support decision making (Priority actions, Decision Trees, ...)
j) Command and Control Operations
DARLENE Platform / DARLENE prototype tutorial kit

a) Introduction to DARLENE prototype Tutorial Kit (DpTK)

b) Experience with DpTK on
   I. DARLENE Wearable Edge Computing Node (WECN) Devices: AR glasses
   II. DARLENE Wearable Edge Computing Node (WECN) Devices: Smart Band
   III. DARLENE GUI toolkit for augmented heads-up display
   IV. DARLENE application for augmented C2 operations
   V. DARLENE Police Car Edge Computing Node (PCEN)

Use Cases

a) UC on Crisis Management & health care provisioning
b) UC on suspect apprehension
c) UC on explosive neutralization
d) UC on neutralization of perpetrators in public spaces
e) UC on other Generic policing challenges (e.g., riots control, etc.)
This Task will deal with the main activities focused on training, which will consist of **two phases**, handled as sub-tasks:

1. **T6.2.1: Training of Trainers (ToT)** of partner end-users' instructors (the ones involved in Platform demonstration and user evaluation {WP5}). They will become **the instructors for the training of LEA end-users and stakeholders in each country**. Through the planned ToT the instructors will be trained in the use of the DARLENE WECN interfaces, undergoing a three-phase course:
   I. Face-to-face ToT in each end-user partner country (lecture seminar -40h & 5 instructors per partner- and a workshop (40h). Total: **400h for 25 instructors**
   II. Remote and virtual ToT workshop among end-user partners using the DARLENE platform
   III. Joint evaluation workshop, taking place at the end of each phase of the ToT
2nd PHASE: T6.2.2

- All instructors trained in sub-task 6.2.1 -> employed to **demonstrate the DARLENE developed solution to relevant stakeholders**
- Each end-user partner will organize presentations and training material, both physical and on-line, with other external end-users utilizing the DARLENE tutorial kit
- Partners will contact **security agencies, inviting them in open, one-day training workshops**
- Each end-user partner will organize both face-to-face and remote training workshops with interested end users (25 participants per partner) = **125 trainees** in total
- An off-line evaluation form will be filled out by trainees at the end of this phase
T6.3: External LEA feedback

Start month: 7 (Mar’21)  
End month: 36 (Aug’23)

**DESCRIPTION**

- After the end of T6.2.2 -> Each end-user partner will report on its action and the feedback received from external end-users and stakeholders.
- The project team will collect the end-user partners’ reports in order to elaborate an external LEA evaluation report.
- The external LEA evaluation will be analyzed and discussed by the project team in a one-day workshop to be held in one of the LEA partners’ country.

**Leader & contributors**
- Leader: ERTZ
- Contributors: CERTH, KUL, PLV, YBQ, KEMEA, PJ, HfoeD, CP, LP

**Deliverables**
- D6.5 (M36): Training of LEA end-users and stakeholders report
- D6.6 (M36): External LEA feedback evaluation report
WP6: Deliverables & MS

Start month: 5 (Jan’21)
End month: 36 (Aug’23)
Active tasks in the reporting period

- **TX.X {Title}**
  - {Contributing partners e.g. FORTH, CERTH, etc.}

- **TX.X {Title}**
  - {Contributing partners e.g. FORTH, CERTH, etc.}

- **TX.X {Title}**
  - {Contributing partners e.g. FORTH, CERTH, etc.}

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  - {Contributing partners e.g. FORTH, CERTH, etc.}

- **TX.X {Title}**
  - {Contributing partners e.g. FORTH, CERTH, etc.}

MS1
Thank you!

Jose L. Diego

proyectosplv@valencia.es
Thank you for your attention!