

# D8.11. SHOTPROS Final Conference Proceedings



Deliverable	D8.11
Deliverable Lead	VESTA
Related work package	WP8
Author(s)	Maaïke Van de Vorst (VESTA), Emma Jaspaert (KUL)
Dissemination level	PUBLIC
Due submission date	30.09.2022
Actual submission	30.09.2022
Project number	833672
Instrument	RIA
Start date of project	01.05.2019
Duration	42 months
Version log	V1.0

## Versions

Vers.	Date	Author	Description
V0.1	20/06/2022	Maaïke van de Vorst (VESTA) Valerie Schlagenhaufen (USE)	Template and structure creation
V0.2	Sept	Emma Jaspaert (KUL)	First draft – preparation of content
V0.3	After final conference event	Emma Jaspaert (KUL)	Additions after conference
V0.4	28/09/2022	Birgit Harthum (USE)	Review & feedback
V0.5	29/09/2022	Emma Jaspaert (KUL)	Final adaptations
V1.0	30/09/2022	Valerie Schlagenhaufen (USE) Gerhard Helletzgruber (USE)	Final review, formatting, and submission

## List of Acronyms and Abbreviations

Acronym / Abbreviation	
CSI	Crime Scene Investigation
D	Deliverable
DMA	Decision-Making and Acting
EU	European Union
LEAs	Law enforcement agencies
VR	Virtual Reality
VRPN	VR and Police Network
XR	Extended Reality

# Table of Contents

<b>Executive Summary</b> .....	<b>4</b>
<b>1 Added value</b> .....	<b>5</b>
1.1 <i>Relation to the SHOTPROS Work packages (WPs)</i> .....	5
1.2 <i>D8.11 is informed by the following deliverables</i> .....	5
1.3 <i>D8.11 consequently feeds into the following deliverables</i> .....	6
1.4 <i>Relation to the SHOTPROS objectives</i> .....	6
<b>2 Introduction</b> .....	<b>7</b>
<b>3 Presentations at the conference</b> .....	<b>7</b>
3.1 <i>Day 1 - Wednesday 14 September 2022</i> .....	8
3.1.1 Keynote speakers .....	8
3.1.1.1 Welcome word “Multi-disciplinary training and innovation” .....	8
3.1.1.2 Opening speech “Police training: changing times and changing needs” .....	9
3.1.1.3 Keynote “The role of practitioners in the EU research and innovation projects” .....	10
3.1.1.4 Keynote “SHOTPROS – A journey through VR police training” .....	11
3.1.1.5 Keynote “Official VR & Police Network kick-off presentation” .....	12
3.1.2 Parallel sessions.....	13
3.1.2.1 “SHOTPROS innovations” .....	13
3.1.2.2 “Human-factor based training framework for VR police training” .....	13
3.1.2.3 “VR applications in a multi-disciplinary context” .....	14
3.1.2.4 “MED1stMR – mixed reality in the field of medical first responders” .....	15
3.1.2.5 “VR and XR applications for CSI – reconstruction, presentation, training and education” ..	16
3.1.3 Panel discussion .....	16
3.2 <i>Day 2 - Thursday 15 September</i> .....	20
3.2.1 Keynote speakers .....	20
3.2.1.1 Welcome word “Virtual Reality Police Network” .....	20
3.2.1.2 “eXtended innovation becomes reality for police” .....	21
3.2.1.3 “How to integrate VR in police training? Getting started” .....	21
3.2.1.4 “Overview of objectives and current activities of XR4Europe” .....	22
3.2.2 Parallel sessions.....	23
3.2.2.1 “The potential of a scenario-based police training in VR for improving officers’ attention, decision-making and acting in high stress situations” .....	23
3.2.2.2 “Materializing the virtual: the contextual impact of multi-sensory experiences in VR” .....	24
3.2.2.3 “The policy-maker toolkit: how to introduce VR into a police organization” .....	25
3.2.2.4 “Plug & Play VR application for police training” .....	25
3.2.2.5 “Reflections on ethics in a VR training context” .....	26
3.2.2.6 “VR and XR platforms to measure the effect of cognitive and physical enhancement technologies” .....	26

3.2.3	VRNP interactive workshops .....	27
3.2.3.1	“Creating future synergies – how to get the most out of the VR & Police Network?” .....	27
3.2.3.2	“Needs and requirements for future VR applications in a police context” .....	28
3.2.3.3	“Challenges for the use of VR in police organisations – what are obstacles and how can we overcome them?” .....	28
3.2.4	Closing of the Conference .....	29
<b>4</b>	<b>Conference proceedings online .....</b>	<b>30</b>
<b>5</b>	<b>Conclusion .....</b>	<b>33</b>

## Table of Figures

<b>Figure 1: Welcome speech of Pieter Van Turnhout.....</b>	<b>8</b>
<b>Figure 2: Opening speech of Governor Cathy Berx .....</b>	<b>9</b>
<b>Figure 3: Keynote speech of Sebastian Serwiak .....</b>	<b>10</b>
<b>Figure 4: Keynote speech of Emma Jaspaert.....</b>	<b>11</b>
<b>Figure 5: Keynote speech of Günther Dauwen .....</b>	<b>12</b>
<b>Figure 6: Welcome word by Wendy van den Branden .....</b>	<b>20</b>
<b>Figure 7: Keynote by Anja Wagner .....</b>	<b>22</b>
<b>Figure 8: Parallel session by Jakob Uhl .....</b>	<b>24</b>
<b>Figure 9: Reference to the conference and the presentations online .....</b>	<b>30</b>
<b>Figure 10: Description of the SHOTPROS conference on the VRPN website.....</b>	<b>31</b>
<b>Figure 11: Summary on VRPN website of the main results of SHOTPROS .....</b>	<b>31</b>
<b>Figure 12: Downloads for didactical guidelines factsheets and presentation decks of conference speakers... </b>	<b>32</b>
<b>Figure 13: Article of the SHOTPROS project website with link to the conference proceedings .....</b>	<b>33</b>

## Tables

<b>Table 1: Deliverables informing this deliverable .....</b>	<b>5</b>
<b>Table 2: Deliverables influenced by this deliverable.....</b>	<b>6</b>

## Executive Summary

The SHOTPROS final conference formed the closing event of the SHOTPROS project. The main aim was to showcase the SHOTPROS VR solution and to present the results from the SHOTPROS project to a broader audience of stakeholders. The final conference took place at the premises of SHOTPROS partner Campus Vesta (in Ranst, Belgium) on 14th and 15th September 2022.

During the conference, the SHOTPROS VR solution was demonstrated, and conference participants were able to try out the SHOTPROS solution for themselves as well. Furthermore, the results of the SHOTPROS project were described and explained in several presentations by consortium partners. Moreover, the consortium chose to organise the conference around the broader topic of VR for police, not only VR training, allowing external speakers to also share their experience and/or research with the audience and to focus on end user relevant topics to raise awareness. The main share of the participants was represented by law enforcement agencies (LEAs) from over 17 European countries.

During the conference, a total of 3 welcome and/or opening speeches and 17 presentations were given, of which nine dealt directly with SHOTPROS' research and results. A total of 25 speakers gave these presentations, from whom 15 were directly related to the SHOTPROS project (either as consortium member or as member of the Advisory Board). Three interactive workshops with the participants were held, each time hosted by a consortium member together with a representative of a LEA partner or Advisor of the project. They served as direct input for the VR & Police Network (objective 5 of SHOTPROS) and the SHOTPROS VR solution itself, the two main sustainable exploitation results of SHOTPROS. Furthermore, one panel discussion took place, which represented a very intensive exchange on different positions regarding VR as a training tool in the police context.

This deliverable 8.11. comprises:

- 1) The conference proceedings: an overview of all the presentations, with an abstract of the content of the presentation (only for longer presentations, not for the short opening speeches), a short bio of the speaker(s), and a link to the PowerPoint presentation of the speaker (if they used it as medium).
- 2) A description about where and how the conference proceedings will be available online. The conference proceedings will be made available on the website of the VR and Police Network (VRPN) ([www.vrandpolice.eu](http://www.vrandpolice.eu)) and on the SHOTPROS website ([www.shotpros.eu](http://www.shotpros.eu)).

# 1 Added value

## 1.1 Relation to the SHOTPROS Work packages (WPs)

The present deliverable is part of the horizontal work package **WP8 – Dissemination, Exploitation & Communication**. It reports the proceedings of the SHOTPROS final conference and the online publication of those. The final conference as such, marks the biggest and final dissemination and communication event of the project. It is reported from an organisational point of view in D7.3, which is complemented by this deliverable D8.11 from a content-oriented side.

## 1.2 D8.11 is informed by the following deliverables

	How did these deliverables influence D8.11?
<b>D1.4</b>	D1.4 describes the process of <b>end user management within SHOTPROS</b> . As the FTs are only possible with end user involvement, this deliverable built the base for the interaction process with LEA partners and other invited end users as network members, interested end users, advisors and other stakeholders.
<b>D8.1</b>	The present deliverable is influenced by the overall communication and dissemination strategy of the project as outlined in D8.1 – Dissemination Plan. Specifically, the communication guide had an influence on the content of the presentations from the consortium partners at the final conference.
<b>All (scientific) deliverables</b>	All relevant <b>results of the SHOTPROS project</b> were presented at the final conference and therefore influenced the present deliverable D8.11.
<b>D7.3</b>	This deliverable contains the report on the final conference and therefore influences and complements the present deliverable D8.11.

*Table 1: Deliverables informing this deliverable*

### 1.3 D8.11 consequently feeds into the following deliverables

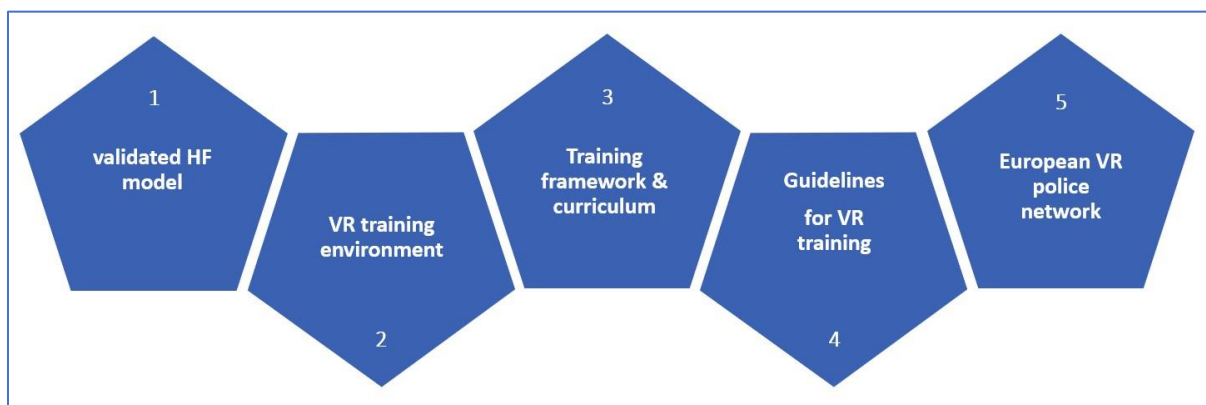
How does D8.11 influence other deliverables within SHOTPROS	
<b>D8.5</b>	This <b>Policy-maker toolkit</b> will be influenced by the management and policy-maker feedback gathered at the final conference. The discussions, but also the challenges faced by a decision maker, which were part of many interactions on the side of the final conference
<b>D8.9</b>	The large media coverage and intensive communication and dissemination work accompanying the final conference will be reported in the <b>Report on dissemination activities including 'VR Police Training network'</b> .

*Table 2: Deliverables influenced by this deliverable*

### 1.4 Relation to the SHOTPROS objectives

There is a strong relation between this deliverable with the 5 SHOTPROS objectives (see Figure 1). The main reason is, that the compiled results of the project (**Objective 1 – 4**) were disseminated and communicated in the presentations, workshops and interactive sessions at the conference as outlined in this deliverable.

Furthermore, the publication of the herewith reported conference proceedings on the website of the Virtual Reality and Police Network (VRPN) and on the SHOTPROS website contributes to a higher awareness and impact of the established network (**Objective 5**).



*Figure 1: The 5 SHOTPROS Objectives*



## 2 Introduction

The SHOTPROS project aimed to investigate the influence of human factors (HF) on decision making and acting under stress at high risk of European police officers. A scientific model (see D7.4), a VR training curriculum with guidelines (see D7.5), a set of technological guidelines for VR training (see D7.6) and scenario creation guidelines for DMA-SR training (see D7.7) built the main results of the SHOTPROS project. All of these results influenced the implementation of the technological SHOTPROS VR solution that was demonstrated in try-out training sessions at the conference to enable interested participants to not only to gain knowledge on VR in the police context but also to experience a VR training session led by experienced VR police trainers from the SHOTPROS team, by themselves. This end user oriented approach (which also formed the basic approach of the project itself) led to a very well received (see results of the conference evaluation in D7.3) final conference of the 42-months Horizon 2020 SHOTPROS project.

This deliverable 8.11. comprises the conference proceedings, as well as access options to these on [www.vrandpolice.eu](http://www.vrandpolice.eu) and [www.shotpros.eu](http://www.shotpros.eu).

For more information about the organisation of the conference (planning and program), the demonstration of the SHOTPROS VR training solution, the demographics of the participants attending the conference, the VRPN and the evaluation of the conference by our participants, see D7.3.

## 3 Presentations at the conference

In this section, all presentations that were given at the SHOTPROS final conference are listed, both on Wednesday 14 September and on Thursday 15 September. A short bio is given of each speaker, as well as a link to their presentation slide deck (if the speaker used one).

The conference delivered:

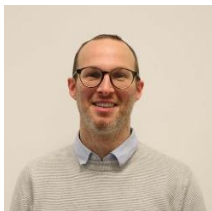
- 3 welcome and/or opening speeches
- 17 presentations (9 with SHOTPROS research and results)
- 25 speakers (15 directly related to SHOTPROS, either as consortium member or as member of the Advisory Board).
- 3 workshops (hosted by a consortium member together with a representative of a LEA)
- 1 panel discussion
- 1 conclusion speech

## 3.1 Day 1 - Wednesday 14 September 2022

### 3.1.1 Keynote speakers

#### 3.1.1.1 Welcome word “Multi-disciplinary training and innovation”

Mr. Pieter Van Turnhout, the CEO of Campus Vesta, welcomed all the conference participants. He states that a common factor for any emergency discipline in the field is having to make decisions with limited information and in a split second. A relevant question is then how to train somebody in situations where decision-making and acting is under the influence of many factors. He uses two important quotes: “Train as you fight, and fight as you train” and “The essence of training is to allow error without consequences”. The aim of SHOTPROS was to find out how training in VR should be designed so that we can close the gap between practice and reality, and to also provide a safe training environment.



**Mr. Pieter Van Turnhout** is the CEO of Campus Vesta since 2021. He is formed as a medic specialised in urgencies and intensive care. He worked for 11 years in the emergencies department, of which 5 years as director. From 2016 to 2018 he was formation coordinator for the fire brigade in the suburban area around Antwerp, to then return to a staff function in the hospital where he soon became vice-director of patient care.



*Figure 1: Welcome speech of Pieter Van Turnhout*

### 3.1.1.2 Opening speech “Police training: changing times and changing needs”

Governor Cathy Berx speaks about the many crises and challenges of the present times. Change can fuel frustration, aggression and fear, but can also fuel great innovation and creative thinking, which SHOTPROS proves with this project. The challenges faced by the police forces grow in direct proportion to the complexity of our society. The better police officers are trained to take the right decisions and act accordingly in stressful and high-risk operational situations, the lower the risk of injuries and trauma for police officers. VR training has assets that more traditional training methods alone cannot offer with the same efficacy, such as the flexibility, endless scenario possibilities, and stress and performance measurements. She thanks SHOTPROS for this engagement, great results and achievements. In 2019, the project started with 6 LEAs, together good for 250,000 police officers responsible for the safety of 60 million European citizens. 3,5 years later, the SHOTPROS conference gathers 18 LEAs who deploy 825,000 police officers responsible for the security of 230 million citizens. Impressive numbers, such as the opportunities of VR training itself.



**Dr. Cathy Berx** is the Governor of the Belgian province of Antwerp since 2008. She is also a professor of Law at the University of Antwerp. Before, she was a top staff member of former Minister-President and Prime Minister Yves Leterme, a member of the Antwerp City Council and vice-chairman of its Social Services Department. She was vice-chairman of the Christian Democratic Party. She joined the Flemish Parliament from 2004-2008.



*Figure 2: Opening speech of Governor Cathy Berx*

### 3.1.1.3 Keynote “The role of practitioners in the EU research and innovation projects”

Mr. Sebastian Serwiak talks about the main benefits and obstacles for the further involvement of end users in European projects in the security area and the way forward. In the past, it was not compulsory to have end user partners in a consortium, but it became clear that projects often diverted from the original goal and did not produce concrete output. The EU wanted to see more products reach full implementation in daily practice and decided to make the involvement of end users at every stage of a project a formal requirement in their work programme. If the end users are to be involved in the uptake of the research and the product, they must feel the ownership of what is being produced. He further discusses the expectations towards the end users concerning their contribution to a project (e.g., practitioners can best define the problem), and describes the benefits (e.g., tackling current and future problems early on) and the observed difficulties (e.g., lack of resources) of end user involvement in research and innovation projects. Involvement in research should be approached by practitioners as procuring innovation and new capabilities. To conclude, he mentions CERIS, a practitioner community with many branches (e.g., fighting crime).



**Mr. Sebastian Serwiak** is the Policy Officer at The Directorate-General for Migration and Home Affairs. He has a long-lasting experience in security research in both national and European dimension. With background of almost 20 years of police service, he was involved in the EU Framework Programmes since 2004 and co-shaped national security research system as Director of the Department of Public Security of the Polish MOI. He continued his involvement in the security research as the MOI representative to the National Centre of Research and Development, and lately as Deputy Director of the National Contact Point for Research Programmes of the EU.

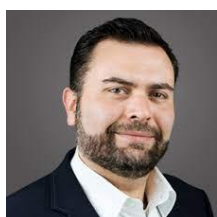
- Consult the presentation slides [here](#)



Figure 3: Keynote speech of Sebastian Serwiak

### 3.1.1.4 Keynote “SHOTPROS – A journey through VR police training”

In this opening keynote, an overview was given of the objectives and results of the SHOTPROS project. The 5 key project goals were described. All objectives strongly support the idea of the European Security Model and support the internal security strategy for the European Union. The key results for the four main stakeholders – trainers, trainees, policy-makers and law enforcement agencies - were presented in a highlight video from the project and serve as an introduction for the following presentations and workshops. The focus is on the technical innovations for the virtual reality (VR) training solution as well as the corresponding training framework "How to train decision-making and acting (DMA) of police officers under stress and in high-risk operational situations".



**Mr. Markus Murtinger** is the coordinator of SHOTPROS and the Director Consulting, Sales & Marketing of USECON GmbH. He works in the field of strategic user & customer experience and digitalisation for over 18 years. He is responsible for more than 200 projects on a national and international level. Markus has many years of experience with stakeholder-centered strategies, user innovation, and experience design methods such as prototyping, design thinking and customer journeys.

*Markus Murtinger was unable to travel to the conference and therefore Emma Jaspaert as a representative of the SHOTPROS consortium and a well-experienced research member of the KU Leuven, presented his slides.*

- Consult the presentation slides [here](#)



*Figure 4: Keynote speech of Emma Jaspaert*

### 3.1.1.5 Keynote “Official VR & Police Network kick-off presentation”

In this presentation, Mr. Günther Dauwen, introduces the audience to the VR and Police Network and asks for the support of all practitioners present to join the network and to create a dynamic network together. He explains what the concrete goals are of the network and how the mission of VRPN (i.e., enhance and encourage the use and development of VR for police and raise awareness for VR topics) can be implemented. Next, he discusses possible activities of the VRPN and asked for input from the audience. More details about the VRPN can be found in D8.9.



**Mr. Günther Dauwen** is the Advisor for European Projects at Campus Vesta. He studied political and social sciences at the University of Antwerp and KU Leuven and worked in and around the EU institutions for 20 years where he was leading several European political and academic networks. Building European networks requires time, patience and respect for the diversity and richness of Europe. Together we can build bridges.

- Consult the presentation slides [here](#)



Figure 5: Keynote speech of Günther Dauwen

### 3.1.2 Parallel sessions

#### 3.1.2.1 “SHOTPROS innovations”

In this session, the (technical) innovations developed in the SHOTPROS project specifically for VR training of police officers were presented. The presented features of the SHOTPROS VR solution expand the existing possibilities of virtual training and make it more realistic, more personal, more sustainable and more adapted to the training goals and personal requirements of the trainees. The results of SHOTPROS are used to show the added value for police training and to illustrate the training workflow.



**Mr. Chris Haarmeijer** is the founder of RE-liON in 1999, together with a fellow computer science student and now CTO Daan Nusman. He served on the advisory board of TNO Defense, Security & Safety as well as the board of the Netherlands Defense Manufacturers Association. Originally working on real-time 3D as a hobby, he is since on a mission to build Training & Critical Mission Planning systems using the latest in immersive technologies for first responders and warfighters.



**Mr. Helmut Schrom-Feiertag** received his Master's degree in Telematics from Graz University of Technology and is a scientist at the AIT Austrian Institute of Technology, center for Technology Experience in Vienna, Austria, for almost two decades. His research focuses on innovations of adaptive virtual reality (VR) training systems that can interpret the user's state and actions in a simulated virtual context and adapt optimally to the user and his or her individual behaviour.

- Consult the presentation slides [here](#)

#### 3.1.2.2 “Human-factor based training framework for VR police training”

In this session, the human factor model of decision-making and acting under stress and high risk (DMA-SR) was presented, which formed the basis of the SHOTPROS project. Moreover, a training framework for VR training for decision-making and acting under stress is elaborated on. Scientific results obtained in the SHOTPROS project were presented, with a particular emphasis on what the model and framework mean for training practices and how they can be implemented by Law enforcement agencies. As usual throughout the whole SHOTPROS project, the session was provided by a multi-disciplinary team of research and end user representatives to again enhance the tangibility of the project results for the participants of the conference.



**Dr. Vana Hutter** is Assistant Professor Sports and Performance Psychology at the Department of Human Movement Sciences, Vrije Universiteit Amsterdam, and senior researcher for the research program “What works in policing: towards evidence-based policing in the Netherlands” at the Netherlands Institute for the Study of Crime and Law Enforcement (NSCR).



**Mr. Ortwin Maetzing** studied psychology and education. For 10 years, he has worked as a coach for top managers, after which he started working as a scientist for Didactics at the State Office for Basic and Further Training and Personnel Affairs of the police North Rhine-Westphalia (LAFP) of the Police of North Rhine-Westphalia, Germany.



**Mr. Alexander Schäfer** is a Police Chief Inspector and a Trainer at the State Office for Basic and Further Training and Personnel Affairs of the police North Rhine-Westphalia (LAFP NRW), Germany. He is working in the field of police further training, including firearms, use of force-training and specialising in training mechanics and didactics for 15 years. Prior to that function he served as an operational police officer in the armed patrol service and public order units.

➤ Consult the presentation slides [here](#)

### 3.1.2.3 “VR applications in a multi-disciplinary context”

In this talk, the importance and benefits are highlighted of VR training tools, such as SHOTPROS, to support multi-disciplinary training of police officers together with other emergency services. Furthermore, the importance of creating networks within and across disciplines to share knowledge about VR and other training opportunities was emphasised.



**Mr. Douglas Stirling** is the Head of the Scottish Multi-Agency Resilience Training & Exercise Unit (SMARTEU), which is part of Police Scotland. SMARTEU consists of resources from the Scottish police, fire and ambulance services. Douglas served in a wide range of roles within the police, including operational policing, community support, firearms, counter terrorism, criminal investigation, counter corruption, detective training and various command roles.



### 3.1.2.4 “MED1stMR – mixed reality in the field of medical first responders”

In this talk, the Horizon 2020 project MED1stMR (GA No 101021775) is presented, which investigates mixed reality training for medical first responders (MFRs). MED1stMR focuses on two central aspects: (1) mixed reality (MR) environment with real manikins and medical tools, and (2) biosignal measurement and AI based smart scenario control. On the one hand Med1stMR will integrate patient simulation manikins and medical equipment into virtual environments to offer realistic training through a rich sensory experience, bringing it closer to reality and enabling both scenario training and medical skill training in the same MR scenario. On the other hand, to enhance the effectiveness of MR training and consequently the performance of MFRs in crisis situations, a physiological signal and trainee behaviour feedback loop with body sensors will be integrated for a smart AI-driven scenario control to personalize and adapt training to the needs. To show the relevance of VR in other but still similar contexts, the partner project of SHOTPROS was selected to give additional insights on multi-disciplinarity, a current and future aspect of collaborative first responder performance.



**Mr. Georg Regal** is a scientist at the Austrian Institute of Technology (AIT), center for Technology Experience and lecturer on Human Computer Interaction at the FH Joanneum and the Technical University Vienna. Georg has over 10 years of experience in HCI research and conducted and coordinated multiple (inter)national research projects. His research focuses on human augmentation and VR as well as accessibility and alternative input strategies for people with disability.



**Mr. Pedro Duque** is the Innovation and R&D Manager of PLUX Wireless Biosignals S.A. He has an Engineering Degree in Physics and Biomedical Engineering from the Sciences and Technology Faculty of the Universidade Nova de Lisboa. He has experience in high-tech environments, from Project Management to Business Development for more than 15 years. He is driven to get people together to solve customers’ challenges in R&D environments with a focus on project performance and going beyond customers’ expectations. He is the Project Manager at MED1stMR European project from project partner PLUX.

➤ Consult the presentation slides [here](#)

### 3.1.2.5 “VR and XR applications for CSI – reconstruction, presentation, training and education”

The Swedish Police Authority is involved in several initiatives to make use of new visualisation techniques. This presentation gives an overview of past and current projects including the Horizon 2020 project RISEN which aims to bring real time forensic analysis to the crime scene and to present the material in XR.



**Mr. Philip Engström** is a research and development coordinator at the Swedish National Forensic centers information technology section. Philip has a M.Sc. in Media Technology from Linköping University and Stanford University, and over 10 years of experience in technical and management roles within the information technology field.

- Consult the presentation slides [here](#)

### 3.1.3 Panel discussion

On Wednesday, a panel discussion was organised with three panelists and one moderator. In this panel discussion, three statements were presented to our panelist about the use of VR in the police context, both in the present and in the future. They took the opportunity to reflect upon these statements, add nuances where they felt necessary, and discuss the statements with each other. Conference participants had the opportunity to vote for or against these statements to also visualise the view of the audience on these statements. The voting results were visible on the screen for all and provided a base for a lively and interesting discussion on different viewpoints on VR and the police. The three panelists come from different professional backgrounds, which sparked interesting discussions.

The three statements asked to the panelists were:

**1) Within 10 years, VR training will have replaced most of the traditional training within police academies and on-the-job training.**

Giny and Jeremy somewhat agree with this statement, although they feel that VR will not replace traditional training, but rather complement it. VR has many benefits for police organisations and can enhance possibilities. It can help them practice more in authentic contexts, especially since the technology will be much more advanced in 10 years. It can also be very cost-effective, since you do not have to travel across the country to do a training or having to find new buildings or sites for training. With VR you can easily create

any kind of settings to match what you want to train. In the future, VR can also be used to train things you cannot train currently in traditional training. However, Douglas mentions that 70% of officers' experience, knowledge and abilities is learned on-the-job and many agencies are so understaffed that they do not have the time to train. In these cases, working the job is still the best on-the-job training. Furthermore, Jeremy made the analogy to the rise of virtual meetings since COVID. At first, everybody was very enthusiastic about it, but now there are many voices that want to go back to just having physical meetings. The same might occur with VR, like any other trend. The trend will rise, but perhaps at some point people might want to go back to physical training.

*A member of the audience voiced concern about the Human Factors and the capability of Artificial Intelligence to fully understand them, and for example doesn't believe an offender in VR can be replaced by AI. Jeremy thinks that we could be surprised how much the technology can evolve in 10 years and that we also have to consider that 25-50% of the police population in 10 or 20 years will consist of younger generations who grew up with these technologies and will more easily adopt this kind of training. Douglas agrees with the future shift in mindset of the younger generations, but he agrees that human factors can never fully be experienced in virtual trainings. Giny also adds that VR is broader than AI. You can do a lot of other things in VR, and it depends on the use case and what you want to do.*

**2) Currently, it is too early to implement VR in police education and practice, since the domain of VR is still in full development and technology is changing too fast.**

The three panelists disagree with this statement. As Jeremy explains: if you wait for technology to be fully mature before implementing the technology, everybody - including criminals - are going to be far ahead of you. According to him, it is again a question of mindset. Do you want to seize an opportunity that is not yet fully mature but can be strategically interesting, or do you wait until it is fully mature and it is already used by everyone? It's a question of how much benefit and how much risk you perceive. He refers to SHOTPROS: it might not yet be perfect, but it's already very good, so it is worth using right now. Douglas agrees that we need to embrace technology now, because it's the way forward. Also, the economic pressures and other constraints placed on trainers and first responders, and access to quality training, is always a challenge and we have to find new ways of doing it. Giny also agrees and explains that the police in the Netherlands decided not to wait and use the reform of their education (going from 4 year to 2 year training) as an opportunity to experiment with VR in their educational program.

*A member of the audience asks Giny if they measured the difference in learning curve between using VR in their training and the old approach, because this could also help convince others to invest in VR. Giny explains that they just started with VR and that they have to wait 2 years before they can measure potential differences (because then the students graduate). But VR already*

*proved to be of added value because students can use the VR tools at home for additional learning outside of teaching hours (that have been cut back with the education reform to two years).*

*Another member of the audience asked Giny if they asked trainers who wanted to use VR or if they forced them, because in their experience a lot of trainers like to stick to what they know. Giny explained how they contacted trainers who in the past already worked a bit with new technologies and asked them to work out some new VR modules with them. She also noticed how important it is to offer support to teachers to get started with VR in their teaching, something Douglas agreed with. He also emphasises the importance of identifying a few champions – preferably those who are highly respected – to convince the others that this is a good change. Jeremy also explains that Europol has recently set up a core group to work on XR and one of the use cases that was identified is training, because there are a lot of opportunities for VR in that area.*

### **3) VR applications should not be used within the police domain because there is no proof that the applications are effective and/or reliable.**

Douglas thinks there is evidence out there that it is effective and reliable, but maybe the evidence is not found yet in the first responder area. But in aviation and in the military, there is already loads of evidence it worked to practice in VR before you go live. Jeremy thinks it is effective as long as there is a need and it fits, and today we have seen that there is a need and it fits. It allows for visualisation before they do it in real-life. Visualising the moves and the situation is already effective. Giny adds that research shows that when you train in VR, you really feel present, and that helps you retain the knowledge for a longer time. So, to use it as an addition in training to prepare them for real-life training, it is already really useful.



**Mrs. Giny Verschoor** is responsible for retrieving the wishes and needs of the Dutch police education for product development in the field of education, knowledge, research and virtual training. Her mission is to promote the professionalism and learning capacity of the Dutch police. In 2022 she was responsible for the development and implementation of VR, which is now integrated into the curriculum of the basic police organisation.



**Mr. Douglas Stirling** is the Head of the Scottish Multi-Agency Resilience Training & Exercise Unit (SMARTEU), which is part of Police Scotland. SMARTEU consists of resources from the Scottish police, fire and ambulance services. Douglas served in a wide range of roles within the police, including operational policing, community support, firearms, counter terrorism, criminal investigation, counter corruption, detective training and various command roles.



**Mr. Jérémy Kespite** is a French Gendarmerie officer who works at the Europol Innovation Lab. He has an operational background, with years of experience managing police officers in the field, and a scientific background as a team leader and project director at the French Law Enforcement IT Department. His current missions involve fostering innovation within the LEA community, leading or coordinating innovative projects and engaging with external stakeholders to create synergies. He is also participating in the extended reality core group, recently launched by the European Clearing Board, and has supported several projects related to VR or AR.



**Dr. Geert Vervaeke (moderator)** is a professor at the Faculty of Law & Criminology of the University of Leuven (KU Leuven) and the Dean of Tilburg Law School at Tilburg University. He is honorary president of the Belgium High Council of Justice (2004-2012).

## 3.2 Day 2 - Thursday 15 September

### 3.2.1 Keynote speakers

#### 3.2.1.1 Welcome word “Virtual Reality Police Network”

Mrs. Wendy van den Branden welcomes the audience to the second day of the conference. She explains it is of the utmost importance that we train police officers in dealing with new challenges. Training facilities need to keep the trainings up to date by taking part in several European projects. The underworld innovates as well and nowadays criminal behavior spreads across Europe faster than ever before. That is one of the main reasons why Campus Vesta will facilitate the formation of the VRPN, to help European LEAs to integrate VR in police training and to foster cooperation on the use of VR in other fields of policing. She encourages the audience to provide them with workable ideas concerning the VRPN.



**Mrs. Wendy van den Branden** is the Director of the police formation at Campus Vesta since 2019 and the Head of EU projects since 2022. She graduated as a master in Germanic languages at the University of Antwerp and was a secondary school teacher for 11 years and a secondary school director for four years.



*Figure 6: Welcome word by Wendy van den Branden*

### 3.2.1.2 “eXtended innovation becomes reality for police”

Innovation is a key driver for embracing the change that surrounds us all. It enables assessing threats and taking profit of the opportunities brought by key enabling technologies. eXtended Reality is one of those technologies that will change the world, blurring the lines between the real world and the virtual world. Being on top of the new types of criminal behavior that come with it, as well as of the opportunities it provides for police training and operational purposes is paramount for law enforcement.



**Mr. Kris D'hoore** is the first Chief Innovation Officer of the Belgian Federal Police and supports the Commissioner General since August 2021 in setting up innovation in the organisation. Kris started his operational career in the Gendarmerie District of Brussels, specialized in information management and worked for almost 12 years as a liaison officer with Interpol in its Headquarters in Lyon and in its Global Complex for Innovation in Singapore.

- Consult the presentation slides [here](#)

### 3.2.1.3 “How to integrate VR in police training? Getting started”

Mrs. Wagner talked about their experiences with VR in the police training of the police North Rhine-Westphalia and concludes they find VR a very useful and effective addition to existing training practices. She further explains how their participation in the SHOTPROS project has fueled the experimentation with and implementation of other VR applications in their organisation. She then also addressed some challenges for the future, such as the regularly changing and developing process of VR and the importance of the inclusion of stakeholders in the development of VR applications. The wish of LAFP is now to use their experience in SHOTPROS to further implement a VR component in their training programs.



**Mrs. Anja Wagner** is a Chief Police Officer and Head of the Department of Police Operational Training and Sport at the State Office for Basic and Further Training and Personnel Affairs of the police North Rhine-Westphalia (LAFP), Germany. She has a master in “Public Administration – Police Management” and has been a policer officer for 26 years. She has held various functions in the patrol service of the police in Berlin and Nordrhein-Westfalen and has been a teacher in the police training for several years.

- Consult the presentation slides [here](#)



Figure 7: Keynote by Anja Wagner

#### 3.2.1.4 “Overview of objectives and current activities of XR4Europe”

The European Non-For-Profit Association XR4Europe was created in May 2021 and is the result of the XR4ALL project supported by the European Commission’s Horizon 2020 programme which ran from December 2018 to August 2021. The founding members are former XR4ALL consortium members and European territorial clusters. The aim is to continue and amplify the actions of XR4ALL. It benefits from the recognition of the European institutions and constitutes the adequate legal framework to defend the interests of the XR community towards these institutions, but also to bring to its members all the services that will support them in their development.



**Mr. Alain Gallez** is the founder and managing director of XR4Europe, a Pan-European association that federates all the XR professionals, organisations and initiatives to support the development, promote and represent XR innovation, industry and creativity made in Europe.

➤ Consult the presentation slides [here](#)



### 3.2.2 Parallel sessions

All parallel sessions were available for all conference participants so that none of them had to choose a specific topic and the audience also had the chance to be able to gain knowledge on topics not directly related to their own discipline.

#### 3.2.2.1 *“The potential of a scenario-based police training in VR for improving officers’ attention, decision-making and acting in high stress situations”*

In this presentation a novel, technology-based training method is introduced that is aimed at improving police officers’ performance under stress, which was developed within the Horizon 2020 project SHOTPROS. Data was collected from 68 police officers who participated in a scenario-based training program in VR. The officers completed three police scenarios with increasing stress potential in teams of three to four. During the testing, the relationship between officers’ attention and subsequent decision-making and acting processes (DMA) was investigated using a multi-method approach (qualitative data and quantitative data on psychological and physiological outcomes). The presentation aims to create a better understanding of the dynamic, complex interplay of psychological and physiological components underlying the stress reaction of European police officers, which manifests in actual, high-stress performance situations on duty. Finally, the presented research will allow practical recommendations for police training in VR.



**Dr. Marie Otilie Frenkel** is a post-doctoral researcher at the University of Heidelberg. Her research focuses on stress and performance psychology in extreme environments.



**Mrs. Friederike Uhlenbrock** is a junior researcher in the field of stress and performance psychology at the University of Heidelberg. Besides her PhD-project, she also works as an applied sports psychologist.

### 3.2.2.2 “Materializing the virtual: the contextual impact of multi-sensory experiences in VR”

Human experience is multi-sensory: seeing, hearing, smelling, tasting and feeling our environment is what makes us living human beings. At the moment one sense is certainly favoured in most virtual media: the sense of sight (closely followed by the sense of hearing) is the predominant way of transporting information, via a screen, projections or a VR-headset. In the context of challenging environments, seeing and hearing are often not enough to transport important information of the environment: the danger that emanates from a puddle of gasoline is mainly recognizable by the piercing smell it emits, to give an illustrative example. In this talk Jakob Uhl discusses the importance and impacts of multi-sensory VR for realism and situational awareness, presents implementations and results from within the SHOTPROS project and reflects upon future usage of multi-sensory elements for challenging environments.



**Mr. Jakob Uhl** works at the AIT Austrian Institute of Technology, Center for Technology Experience and is currently working on his FFG funded PhD in Human-Computer Interaction at the PLUS university of Salzburg. Coming from the field of psychology, his interest lies in the study of human experience and behavior in extended reality (XR), with a special focus on measuring the sense of presence and immersion when integrating modalities like the sense of touch and smell into XR.

- Consult the presentation slides [here](#)



*Figure 8: Parallel session by Jakob Uhl*

### 3.2.2.3 *“The policy-maker toolkit: how to introduce VR into a police organization”*

The policy-maker toolkit was developed in the course of the SHOTPROS project to provide strategies and executive summaries for policy-makers in the field of training for law enforcement. The presentation provides an overview of the toolkit, focusing on the introduction of virtual reality (VR) training in a police organisation. This digital transformation process must be planned carefully with clear objectives, responsibilities and involvement as key success factors. A light was shed on this topic from a theoretical and practical point of view.



**Mrs. Valerie Schlagenhaufen** works at USECON as Marketing & Business Development Manager. Her focus is on communicating, disseminating, and marketing international innovation projects. With a background in marketing and digital transformation, she contributes to the development of guides and toolkits for successful implementation of new technologies in the security domain.

- Consult the presentation slides [here](#)

### 3.2.2.4 *“Plug & Play VR application for police training”*

Often the introduction of VR in training causes complex purchasing processes, high budgets and many internal process adjustments. This discourages many from simply starting out. For the first steps, VR training does not have to be expensive and complex. There are also simple, cheap but efficient VR solutions to start with and to be able to convince the management and policy-makers for more. The internal awareness grows and knowledge of the technology is gained – this supports when more powerful, full immersive solutions will be introduced. Within simpler methods, the training objectives need to be narrowed down, but for basic training, these tools can be helpful. In this presentation, an overview was given of these first introduction steps done by the SIAK (Austrian Police Academy).



**Ronald Maringer** has worked for the Austrian police for more than 20 years. After more than 10 years in the drug department, he changed to the Austrian SIAK, the Police Academy in Vienna. With his technical and application-oriented background, he became the Coordinator of Digital Content and Development in Police Training at the SIAK. He is also an educated trainer of Police Mission Skills, Communication, De-escalation Skills and applied psychology at the Police Academy in Vienna.

- Consult the presentation slides [here](#)

### 3.2.2.5 “Reflections on ethics in a VR training context”

In this presentation, ethical questions and considerations concerning the materialisation of scenario-based training for police officers in VR are highlighted. The presentation focuses on ethical issues related to (1) user data protection, (2) user well-being, and (3) VR design. The aim of the presentation is not to provide an exhaustive overview of all ethical questions (and answers) concerning police training in VR, but rather to emphasise and stimulate the need for ethical reflections when developing or using a VR training system.



**Dr. Emma Jaspaert** is a criminologist and a post-doctoral researcher at the Department of Criminal Law & Criminology, Faculty of Law and Criminology, of the University of Leuven (KU Leuven). She is active in several research domains, including psychology and law, police training, and ethics. She has participated in several innovation projects concerning the use of VR for police training.

➤ Consult the presentation slides [here](#)

### 3.2.2.6 “VR and XR platforms to measure the effect of cognitive and physical enhancement technologies”

Real-time physiological stress and performance monitoring is a relevant addition to virtual reality (VR) training for high-risk professions, such as the police force. VR is highly suitable for the implementation of such monitoring due to the controlled environment and the already used wearables. During this presentation, a broader overview is given of the VR and XR technologies that TNO is testing and applying right now. Furthermore, the SUIT VR training application as measurement platform is presented. To that aim, Olaf Binsch also presents the results of a study that he has conducted to test whether we can use accelerometry to correct non-invasively measured heart rate (HR) for physical activity in 23 trainees who performed three room-clearing VR scenarios. In addition, current work plans and experiments will be presented to use the SUIT application to measure cognitive abilities that are key to accomplish action-intelligence scenarios in the context of special operation forces.



**Dr. Olaf Binsch** is a Senior Research Scientist at the Netherlands Organization for Applied Science (TNO). His primary activities include to lead acquired research programs and projects at the department of Human Performance with the focus areas in the domains of human enhancement, mental resilience, gaming and simulation, human performance and human performance degradation. He also leads the coordination of the current Military Human Factors research between

the partner labs of DRDC Canada, FOI Sweden and TNO for the Dutch Ministry of Defense.

- Consult the presentation slides [here](#)

### 3.2.3 VRNP interactive workshops

Three parallel interactive workshops were organised. Each participant of the conference could sign in for one of the three workshops. The objective of these workshops was to collect information that was relevant for and could serve as input for the VRPN network and/or the final SHOTPROS results. More details about the results from these workshops can be found in D8.9.

#### 3.2.3.1 *“Creating future synergies – how to get the most out of the VR & Police Network?”*

In this workshop, the participants were encouraged to brainstorm about possible future VR cooperation within the police context, to create future synergies. How can we work together, support each other? Participants were asked to dream together about how an ideal VR Police Network (VRPN) could look like and how we can get the most out of VRPN.



**Mr. Günther Dauwen (workshop host)** is the Advisor for European Projects at Campus Vesta. He studied political and social sciences at the University of Antwerp and KU Leuven and worked in and around the EU institutions for 20 years where he was leading several European political and academic networks. Building European networks requires time, patience and respect for the diversity and richness of Europe. Together we can build bridges.



**Mr. Alexander Schäfer** is a Police Chief Inspector and a Trainer Trainer at the State Office for Basic and Further Training and Personnel Affairs of the police North Rhine-Westphalia (LAFP NRW), Germany. He is working in the field of police further training, including firearms, use of force-training and specialising in training mechanics and didactics for 15 years. Prior to that function he served as an operational police officer in the armed patrol service and public order units.

### 3.2.3.2 *“Needs and requirements for future VR applications in a police context”*

In this workshop, the participants were encouraged to envision possible future VR applications within the police context and to reflect upon the desired use and functionalities of such applications. What VR applications could be helpful for the police practice and how should they work? Or which current VR applications within the police context deserve further attention?



**Dr. Emma Jaspaert** is a criminologist and a post-doctoral researcher at the Department of Criminal Law & Criminology, Faculty of Law and Criminology, of the University of Leuven (KU Leuven). She is active in several research domains, including psychology and law, police training, and ethics. She has participated in several innovation projects concerning the use of VR for police training.



**Mr. Hans Pieren (workshop host)** is Operational Supervisor in the police of Amsterdam, the Netherlands, and specialist in the field of hazard management and violence control. Before, he was a uniformed police officer and operator of the Arrest Team in Amsterdam. In the police academy, he is involved in learning and innovating with VR.

### 3.2.3.3 *“Challenges for the use of VR in police organisations – what are obstacles and how can we overcome them?”*

In this workshop, the participants were encouraged to discuss the challenges for the use of VR in police organisations, and brainstorm about possible solutions for these challenges. The mere existence of (VR) technology or new training methods does not imply that they can be adopted by police organisations overnight. What are your insights and experiences, and how do others overcome the obstacles they face?



National Crisis Center

**Mr. Nino Van Impe (workshop host)** works at the CBRNe Expertise Center of the Belgian National Crisis Center and is responsible for projects related to chemical, biological, radiological, and nuclear terrorism and criminal incidents. He is involved in several national and international working groups in the field of security and crisis management and represents the National Crisis Center in different European projects.



SHOTPROS

**Mr. Gregory Marcus** is first inspector, trainer and specialist in violence control with and without firearms. He is currently also the SPOC with regards to the implementation of VR in the police zone Brussels-North in Belgium.

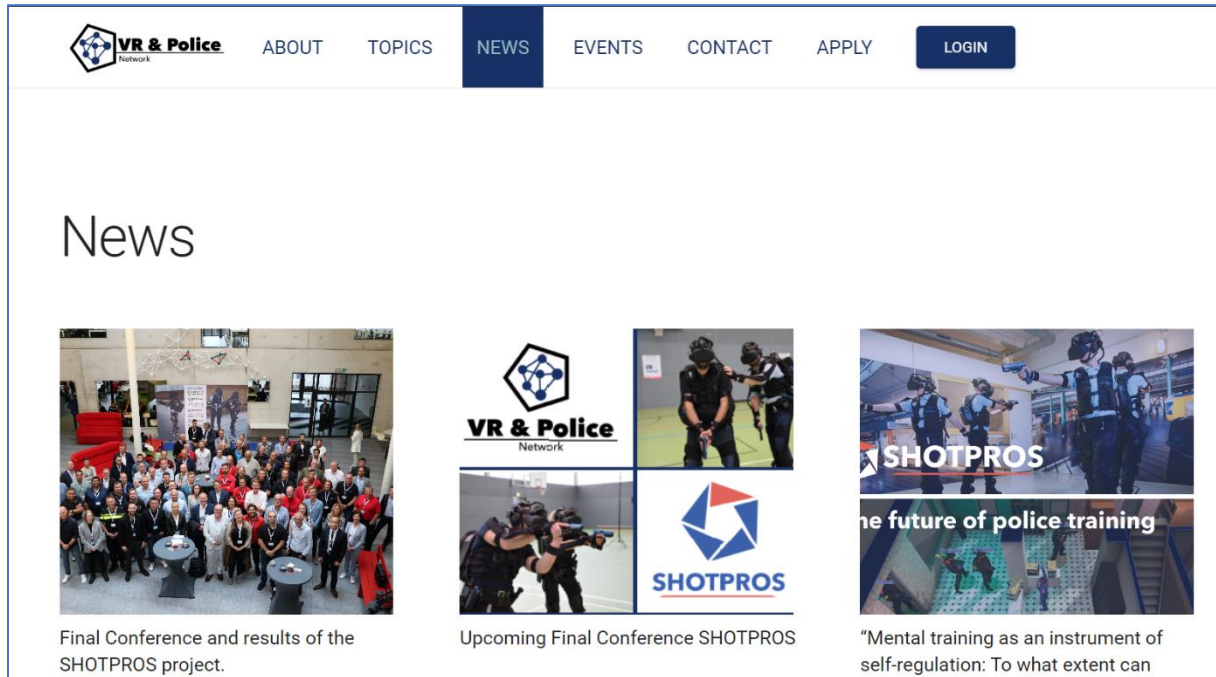
### 3.2.4 Closing of the Conference

After the three workshops, the results of each were presented in a summarised way to the complete audience. Following this input, a short review on the conference was given and the SHOTPROS final conference was closed.

- **Consult the presentation slides [here](#)**

## 4 Conference proceedings online

The SHOTPROS conference proceedings are published online, on the website of the VR & Police Network (VRPN): [www.vrandpolice.eu](http://www.vrandpolice.eu). A separate heading in the “News” section on the VRPN website has been dedicated exclusively for the SHOTPROS final conference (see Figure 9).



*Figure 9: Reference to the conference and the presentations online*

In this section about the Final Conference, a short description is given about the conference (see Figure 10), with information about the number of participants and the feedback received from the participants (for more information, see also D7.3). Next, a summary is given of the main results of SHOTPROS (see Figure 11). Next, the factsheets for the didactical training guidelines can be downloaded from the webpage as well as the presentation decks of the speakers at the conference (see Figure 12).



The screenshot shows the top navigation bar of the VR & Police Network website with links for ABOUT, TOPICS, NEWS, EVENTS, CONTACT, APPLY, and a LOGIN button. The main heading reads "Final Conference and results of the SHOTPROS project." Below the heading, it indicates the article was posted 19 hours ago by Gunther Dauwen and is categorized under "News, Virtual Reality, Virtual Reality Training". A large group photograph of conference attendees is displayed. The text below the image states: "At the end of 3,5 years of hard work in the SHOTPROS project, we present, for the purposes of the participants of the Final Conference

Figure 10: Description of the SHOTPROS conference on the VRPN website

The screenshot shows the same navigation bar as Figure 10. Below the group photograph, the text summarizes the project's achievements: "At the end of 3,5 years of hard work in the SHOTPROS project, we present, for the purposes of the participants of the Final Conference and the members of the VRPN, a summary of the tangible RESULTS. SHOTPROS is a Horizon 2020 project about: **A Human Factors Based (VR) Training Framework for Decision-Making and Acting (DMA) -Capabilities under Stress and in High-Risk Situation for European Law Enforcement Agencies (LEAs).** More info [www.SHOTPROS.eu](http://www.SHOTPROS.eu)

We organised a **successful EUROPEAN Final Conference** with **125 participants** from **17 Countries**. Our participants (from Norway to Malta and from Iceland to Romania) evaluated the event as **very well organised** (95% satisfaction). Our **project was presented very positively in the media**: we were seen on 3 TV stations, heard on the radio and in the written press. The Belgian Minister of the Interior **Annelies Verlinden will promote SHOTPROS in the upcoming EU security summit**. In this networking event 80% of participants said to be **keen to enter into the VR and Police network (VRPN)**.

Figure 11: Summary on VRPN website of the main results of SHOTPROS

[ABOUT](#)
[TOPICS](#)
[NEWS](#)
[EVENTS](#)
[CONTACT](#)
[APPLY](#)

LOGIN

## Summarising the results of the SHOTPROS project:

- 42 months hard work with the results shown in **a leaflet** or **a video report**
- 13 partners, 20 studies, 4000 participants, 6 Field Trials
- 125 participants, 17 countries, 28 speakers, 50 VR try-outs
- A SHOTPROS **Final Evidence-based HF Model for DMA-SR** (to include D7.4)
- 1A **#VR #police #training curriculum** (to include final D7.5)
- A SHOTPROS **Final guidelines for VR training** (to include D7.6) and 7 **Didactical Training guidelines:** (For more info, including a didactical video, see points 1-7 below)

1. Is there constructive, motivating feedback? PDF click here

Figure 12: Downloads for didactical guidelines factsheets and presentation decks of conference speakers

[ABOUT](#)
[TOPICS](#)
[NEWS](#)
[EVENTS](#)
[CONTACT](#)
[APPLY](#)

LOGIN

7. Is there a clear assignment? PDF click here

- SHOTPROS Final Evaluated VR Training Scenarios**
- A **Policy maker toolkit** (can be added in October)
- 16 Presentations of the FINAL Conference:** (For more info, see points 1-16 below)

1. **Role of practitioners in the EU research and innovation projects:** *Sebastian Serwiak, European Commission, Directorate-General for Migration and Home Affairs, Unit F2 – Innovation and Security Research (PDF presentation click here)*
2. **SHOTPROS – a journey through VR police training, an overview of the project results:** *Markus Murtinger, SHOTPROS coordinator, USECON GmbH and Emma Jaspaert, KULeuven (PDF presentation click here)*
3. **SHOTPROS innovations:** *Chris Haarmeijer, RE-liON and Helmut Schrom-Feiertag, AIT -Austrian Institute of Technology (PDF presentation click here)*
4. **Human-factor-based training framework for VR police training:** *Vana Hutter, Vrije Universiteit Amsterdam & Ortwin Maetzing and Alexander Schäfer, LAFP Police North Rhine-Westphalia, Germany (PDF presentation click here)*

In the news-section of the SHOTPROS project website - <https://shotpros.eu/category/news/>, an article about the conference is published with a link to the publication of the conference proceedings on the VRPN website.

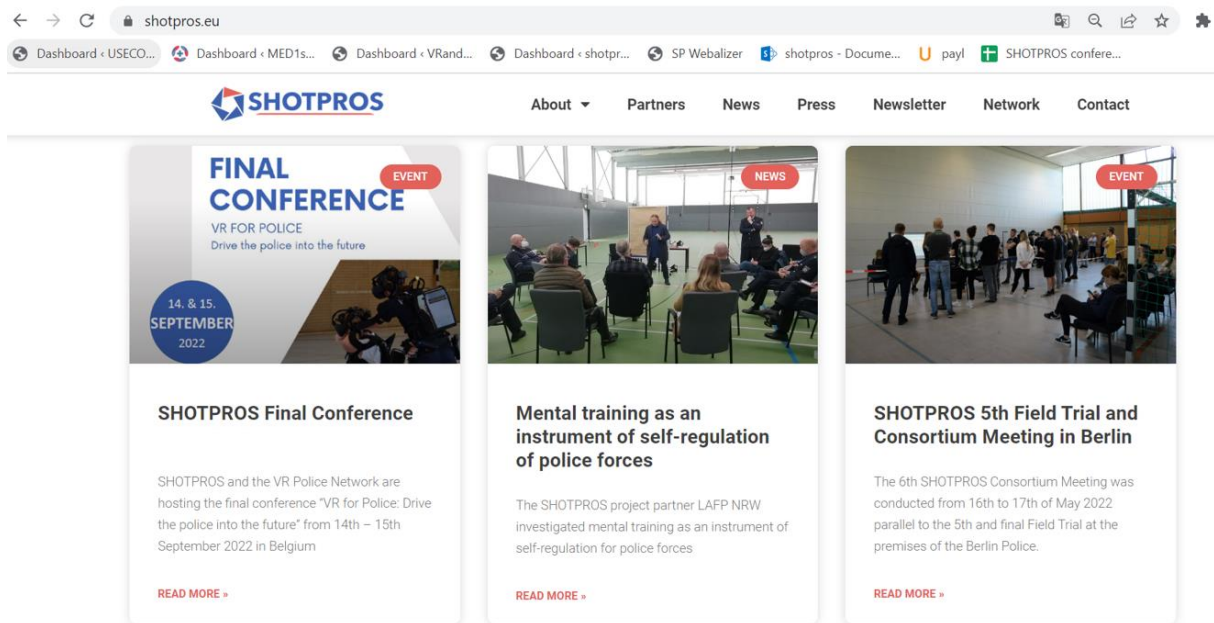


Figure 13: Article of the SHOTPROS project website with link to the conference proceedings

Furthermore, all participants have received an e-mail with links to all the presentations slides, together with a short bio of the speakers.

## 5 Conclusion

With over 130 participants from 17 European countries attending the conference, the SHOTPROS conference has been a huge success. Based on a qualitative and quantitative analysis of the questionnaires we asked participants to fill out, evaluating the organisation and the content of the conference, it became clear participants have highly appreciated to learn more about (and experience) the SHOTPROS results (see D7.3 for more information).

This deliverable provides an overview of the content of the conference with important details about the content, speaker(s) and links to further information. Furthermore, this detailed overview of all presentations, together with the links to the PowerPoint slides of the presentations has been published on the website of the VR & Police Network (VRPN), offering the opportunity to all interested stakeholders, including those who were not present at the conference, to consult the information and learn more about the SHOTPROS project and its results.