

# CEASEFIRE



Advanced versatile artificial intelligence technologies and interconnected cross-sectoral fully-operational national focal points for combating illicit firearms trafficking

**Coordinator:** Centre for Research and Technology – Hellas (CERTH, Greece)

**Consortium:** 14 Countries, 21 Partners

**Duration:** 36 Months

**Start Date:** October 2022

**Use-Cases:** 5

**Type:** Innovation Action

**Goal:** Combat firearms trafficking using advanced Artificial Intelligence (AI) and Information & Communication Technologies (ICT)



The EC-funded Horizon Europe CEASEFIRE project (2022-2025), improves the crime-fighting ability of European nations using modern technology. It brings together 7 companies, 5 research organizations and 9 Law Enforcement Agencies (LEAs) from all over Europe.

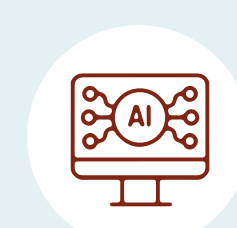
## The challenges

**Trafficking of illicit firearms** funds and arms organized crime. LEAs trying to combat firearms trafficking face difficult challenges that were not even conceivable just a few years ago.

- Modern criminals use illegal, hard-to-monitor and volatile **Dark Web** marketplaces.
- **Cryptocurrency** transactions provide anonymity in illegal exchanges.
- Involved parties coordinate via the regular **“Surface” Web** and social media.
- **3D printing** technology allows easy digital distribution of weapon **blueprints**.
- Modern criminal groups utilize **regular post and courier services**, concealing guns among licit goods within mailed parcels.
- **In-the-field identification of seized weapons** is a real challenge for LEAs:
  - Extremely high diversity in firearm appearance.
  - Possible erasure of serial numbers by criminals.
  - Lack of specialized LEA practitioner training.

## The pillars

CEASEFIRE exploits AI and digital technologies to assist LEAs. It is structured around 5 key pillars:



**Pillar 1.** Develop **innovative, advanced, AI-powered technologies** to boost LEA authorities in tackling firearms trafficking criminal activities.



**Pillar 2.** Enhance **trans-national, cross-disciplinary, multi-agency, operational cooperation and information exchange** among LEAs.



**Pillar 3.** **Conduct criminological analysis** of the phenomenon and **ensure compliance** with European legal/ethical norms.



**Pillar 4.** **Foster the adoption of advanced technologies** in current operational environments, through **hackathons, training activities and pilot studies**.



**Pillar 5.** Engage in **intense dissemination, community building and exploitation planning** activities.

## The technologies

The digital tools contained in the CEASEFIRE system are powered by advanced algorithms.



**Web Crawling.** Configurable and AI-assisted Web crawlers allow LEA users to easily retrieve data relevant to firearms trafficking from on-line sources.



**Computer Vision.** Automatic analysis of various types of images, ranging from regular photographs to 3D printing blueprints or X-ray scans of mailed parcels.



**Natural Language Processing.** Automatic analysis of various text snippets (e.g., taken from on-line forums), language translation, etc.



**Graph Analytics.** Graph modelling and analysis powers various CEASEFIRE functionalities:

- Automated cryptocurrency transactions analysis.
- Data fusion and correlation estimation.
- Reconstruction of criminal networks.

## Use-cases and tools

### Use-Case #1: Real-time systematic firearms incident and intelligence information collection and exchange.

A CEASEFIRE digital application enhances the **intelligence picture** of LEAs on firearms trafficking at a pan-European level. Based on periodic **retrieval of information** from on-line news articles and advanced AI, such as **Natural Language Processing**, it automates organization of incidents in a structured manner and in near-real-time, while facilitating **risk indicators, red flags** and inter-LEA **exchange of strategic intelligence**.



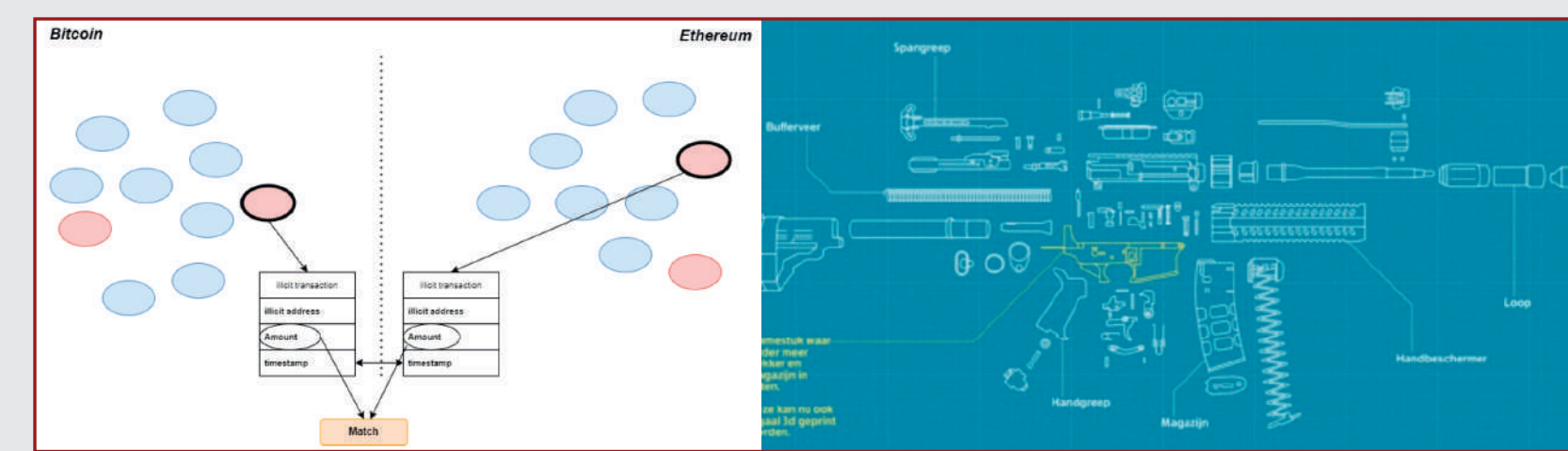
### Use-Case #2: On-the-spot firearm seizure registration and cross-border data search.

A CEASEFIRE tool assists LEA officers in crime scenes during **firearms seizures**. An officer takes photographs using a **mobile device**, which then **analyzes the photos** to identify the characteristics (e.g., model, caliber, serial number location) of seized firearms using advanced AI, such as **Deep Neural Networks** for **computer vision**. The mobile app can transmit reports to the central CEASEFIRE system database for **further cross-analysis**.



### Use-Case #3: Firearms purchase on Dark Web marketplaces. & Use case #5: 3D-printed firearm blueprints distribution.

A set of interrelated CEASEFIRE digital tools allows detection of **Dark Web transactions involving firearms** or related **cryptocurrency payments**, identification of Web user **discussions about firearms**, as well as **monitoring the distribution of blueprints for 3D-printed firearms** in on-line forums.



### Use-Case #4: Mail order and courier service firearms trafficking detection using scanning technologies.

A CEASEFIRE digital tool supports customs officers who use **scanning equipment** to take **X-ray images of mailed parcels**. A friendly **desktop application** performs **on-demand detection** of firearms, firearm components and ammunition on these X-ray images using advanced AI, such as **Deep Neural Networks** for **computer vision**. The application can transmit reports to the central CEASEFIRE system database for **further cross-analysis**.



## Summary

Illegal arms trafficking is a major challenge for European society and law enforcement. CEASEFIRE represents a concerted EC-funded effort towards facing this threat, by putting state-of-the-art technology to good use.

CEASEFIRE Website:  
<https://ceasefire-project.eu/>

CEASEFIRE LinkedIn:  
<https://www.linkedin.com/company/ceasefireproject/>

CEASEFIRE Facebook:  
<https://www.facebook.com/people/CEASEFIRE-Project/100089862614779/>

CEASEFIRE X/Twitter:  
<https://twitter.com/CEASEFIREHE>

CEASEFIRE Youtube:  
<https://www.youtube.com/@CeasefireProject>

Any relevant stakeholder (LEAs, security-related EU/national/international bodies and initiatives, related EC-funded research projects, SMEs active in security products/services, etc.) are welcome to join the CEASEFIRE community, in order to receive regular updates, news and invitations from the wider security ecosystem!

You can subscribe easily at <https://ceasefire-project.eu/community/>. All personal information are kept internally within CEASEFIRE, adhering to the highest privacy standards.



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