



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 312883.

Home made explosives (HMEs) and recipes characterisation – Capability Project Overview

Stefanos Vrochidis

Information Technologies Institute

Centre for Research and Technology Hellas (CERTH)



HOMER Project

	Duration: 36 Months		Partners: 10
	Start/ End Dates: 1 st Nov 2013 – 31 st Oct 2016		Work Packages: 7

- The purpose of HOMER is to expand the knowledge of European bodies about Home Made Explosives (HMEs) to increase the security of the European citizen and support Europe's current and future security needs.
- The goal of the HOMER project is to implement a study to mitigate the threat of homemade explosives from the criminal and terrorist element. This will be achieved by the development of researched HME knowledge made available, through innovative, secure and usable means, for the use of law enforcement agencies, security and the manufacturers of products that can be used as precursors.



HOMER Project: Primary Tasks

- Development of a HME Data Structure (**WP2**)
- Empirical study on Web content with HME information; Development of discovery, retrieval and analysis tools for HME-related Web, multimedia and social media content (**WP3**)
- Analysis of HME recipes discovered and identified for validity of information, volatility, ease of manufacture (**WP4**)
- Development of a multi-user HME Knowledge Management Platform (KMP) (**WP5**)
- Testing and validation of systems including assessment of impact and measurements on human, operational and organisational processes (**WP6**)
- Development of a draft European Standard on HMEs, vocabulary and definition (**WP7**)



HOMER Project: Partners



Co-Ordinator/ End User
Police Service of Northern Ireland



Industry
Yara SA



Tamar Explosive Laboratories Limited



Academic



Trinity College Dublin
Queens University Belfast
Centre for Research and Technology Hellas
Federal Research Institute Germany
South East European Research Centre



End Users
Guardia Civil



Bulgarian Defence Institute

Project Support:

External Advisory Board – Fertilisers Europe, Centre for Applied Science & Technology, ICT Specialist
Security Review Group – UK Government Agency, Federal Ministry of the Interior Austria, ISDEFE Spain



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Use of HMEs



Kinawley, Fermanagh, weapons haul included pipe bombs, gun and fertiliser



Car bomb explosion after taxi driver forced to drive device to Northern Ireland police station

A car bomb has exploded outside a Northern Ireland police station after a taxi driver was forced at gunpoint to drive the device there.



Have about a trip to Ballymerry, County? ...
Ballymerry Police Station



Damage was caused to the heavily fortified station plus surrounding buildings including nearby homes and garages.



Broke businessman brings chaos to Madrid after packing his car with gas canisters and fertilizer and smashing it into the HQ of the country's ruling party over austerity

- Daniel Perez Bertraga, 37, said he 'lost everything' due to austerity policies
- Wanted his car was full of explosives 'timed to go off within 45 minutes'
- Robot was used to examine smashed Citroen Xantia in foyer of the building
- Spain has second-highest unemployment in Europe, with 5.6million jobless

By NIKHIL GOSSWAMI FOR MAILONLINE
PUBLISHED: 11:30, 10 December 2010 | UPDATED: 12:26, 11 December 2010



NEWS

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Oslo: Bomb blast near Norway prime minister's office

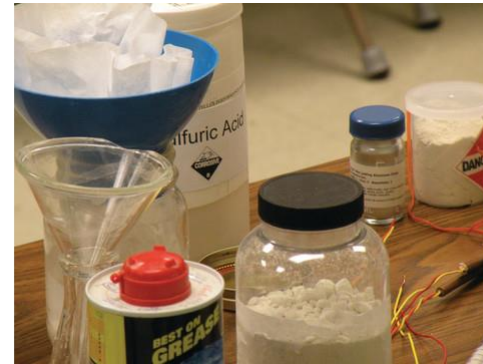
10:22 July 2011 | Europe





New Challenges for LEAs

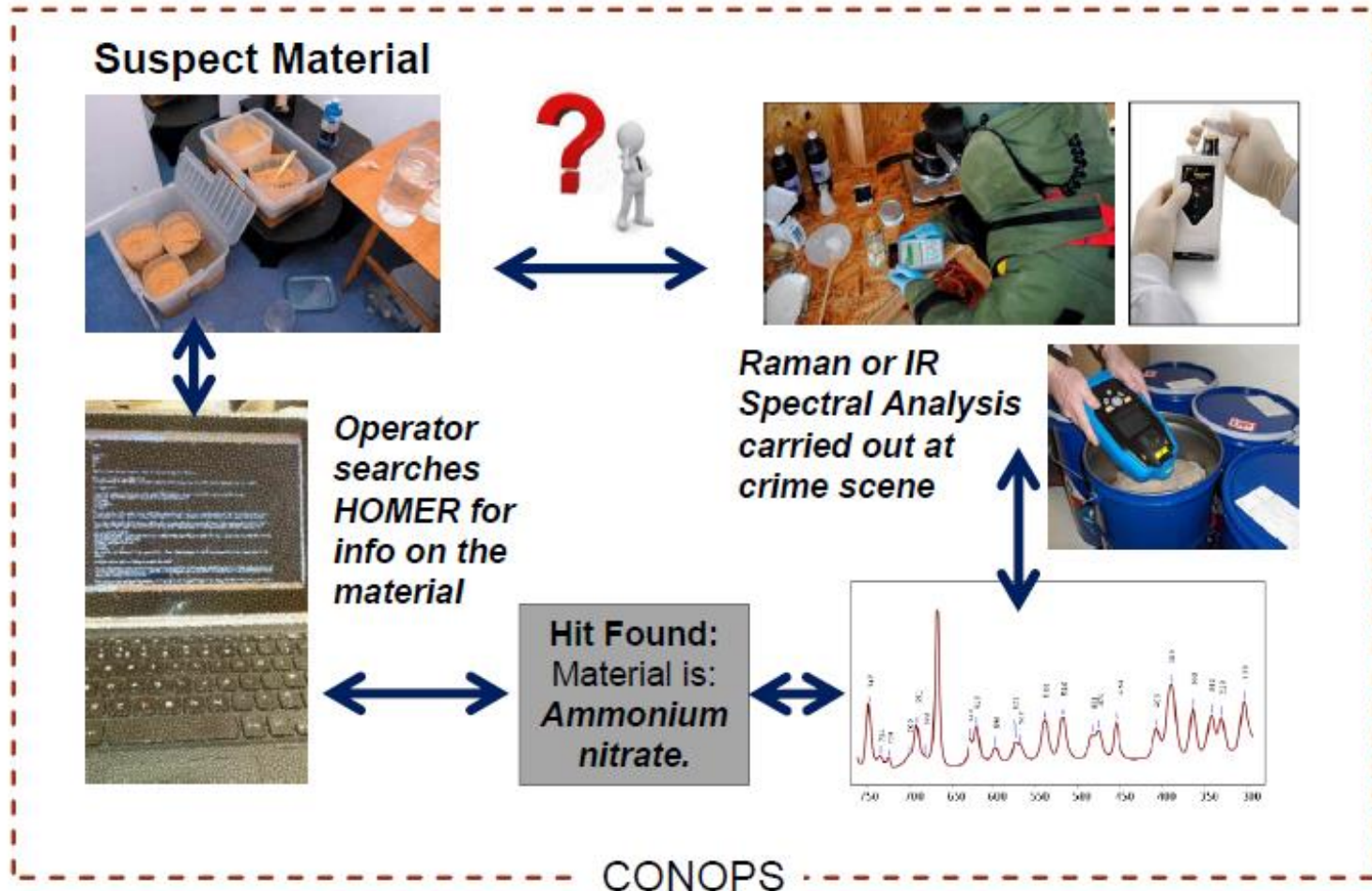
- Extensive use of the Web and Social Media/Multimedia Platforms for diffusing knowledge related to terrorism and the construction of IEDs and HMEs



- Construction of HMEs by using everyday household goods



Identification of HMEs using HOMER





Support LEAs via HME Discovery Tools

- Provide a suite of tools for discovering, retrieving and analyzing HME-related content on the Surface/Dark Web
 - Web pages
 - Blogs
 - Forums
 - Multimedia posts
 - Social media posts
- Support LEAs based on the user needs
 - Gather intelligence using interactive tools
 - Filter the most significant resources



HME Discovery Tools/Web Searching

- Exploit existing search engines for discovering HME Web resources by running keyword-based searches
 - Select the search engine(s) of preference from Surface/Dark Web (e.g. Bing, Yahoo!, DuckDuckGo, Torch)



DuckDuckGo

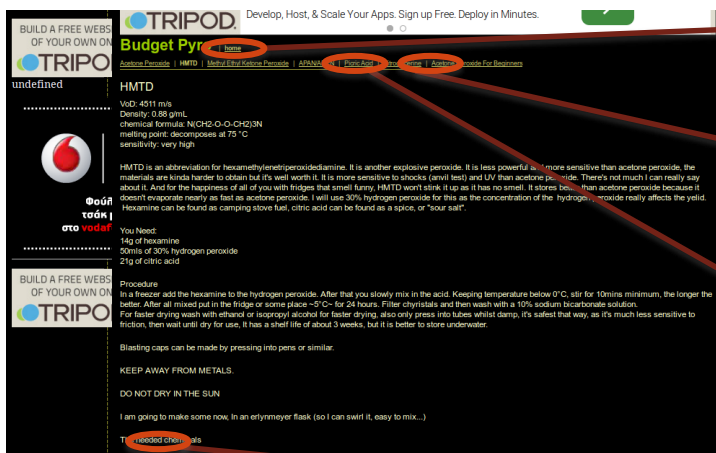


The screenshot shows the HOMER Discovery Tools interface. At the top, there is a search bar with the text "mercury fulminate" and a dropdown menu set to "Yahoo! x". Below the search bar, there are buttons for "Free Text Search", "Explosives", "Ingredients", and "HME discovery". The search results show a link to "FULMINATE COMPOUNDS - unito.it" with a score of 0.98. The description of the link states: "Mercury(II) fulminate is highly sensitive to friction and shock and sparks. It is mainly used as a trigger for other explosives in percussion caps and blasting caps ...".



HME Discovery Tools/Web Crawling

- A Web crawler exploits the graph structure of the Web for the discovery of HME Web resources
- **Focused Web Crawler:** Selects which hyperlinks to follow by estimating their relevance to the HME domain based on local evidence on parent page (e.g. text around a hyperlink, anchor text)



` Home `

` Picric acid `

` Nitroglycerine `

Check out my web site on my other hobby:
` motorcycles `



HME Discovery Tools/Multimedia Analysis

- Perform keyword-based searches on the Youtube platform
- Present the results (video preview + video metadata)
- Identify the HME-related concepts (i.e. objects) present on the discovered videos (e.g. glassware, smoke, liquid)
- Display whether a video file is HME-related or not

The screenshot displays the HOMER Discovery Tools interface. At the top, there is a search bar containing the text "acetone peroxide". To the right of the search bar is a slider control with a red indicator at 0.5, and buttons for "Search" and "Upload". Below the search bar, a video preview is shown with the title "Make acetone peroxide-high explosive". The video thumbnail shows a bright explosion. To the right of the video preview, the following metadata is displayed:

Title: Make acetone peroxide-high explosive
Description: This video is for educational purpose only. Take extreme caution. I'm not responsible for what you do based on this video.
Tags: Acetone Peroxide (Chemical Compound), Explosive Material (Film Subject), Acetone (Chemical Compound), Fire
Concepts Retrieved:
Outdoor: 0.612436

At the bottom right of the video preview, there is a green checkmark icon, indicating that the video is HME-related.



HME Discovery Tools/Social Media Analysis

- Identify of Twitter users involved in HME recipes exchange
 - Keyword-based search on Twitter (i.e. keywords, hashtags)
 - Continuous retrieval and presentation of relevant results (user tweets)

The screenshot displays the 'HOMER Discovery Tools' interface for 'Social Media Analysis'. The main heading asks 'What do you want to monitor?'. Below this, the 'Collection Name' is set to 'HomeMadeExplosives'. The 'Place your Tags' section shows 'lead azide' as the current tag, with examples like 'Pollution', 'Overpopulation', 'Waste', and 'Climate change'. A row of selected tags includes 'nitroglycerin', 'acetone peroxide', 'ammonium nitrate', and 'hydrogen peroxide'. A green bar at the bottom of the setup area says 'All set? Hit the Launch Button' with a power icon.

The right side of the screenshot shows a grid of retrieved tweets:

- cbstrong68**: @fpsuper blue dawn, hydrogen peroxide and baking soda works great! (13 Jul 2016, 0 retweets)
- Pharmacy_Today**: RT @magnoliarx: Cleaning Your Wound: Hydrogen Peroxide or Soap and Water? (13 Jul 2016, 1 retweet)
- BlameOxytocin**: Hydrogen peroxide-induced oxidative damage in peripheral blood lymphocytes from rats chronically treated with... (13 Jul 2016, 0 retweets)
- magnoliarx**: Cleaning Your Wound: Hydrogen Peroxide or Soap and Water? (13 Jul 2016, 1 retweet)
- WaterOnline**: On-Site Hydrogen Peroxide Generation for Advanced Oxidation Process
- maggies31**: Lots of uses for hydrogen peroxide, but this is one!
- BY_climatechange**: (No text visible)
- AllisonandMoon**: @TheKatrinaSet hydrogen peroxide soak.



HME Discovery Tools/Social Media Analysis

- Community detection, Key player identification
- Analytics (e.g. most active users, user locations, heatmaps)

The screenshot displays the HOMER Discovery Tools interface for Social Media Analysis. The main view is titled "Community Detection" and features a network graph of blue and yellow nodes representing communities and users. A sidebar on the left contains navigation options like "HOME PAGE", "SEARCH", and "SETTINGS".

Below the community detection view, there are three panels:

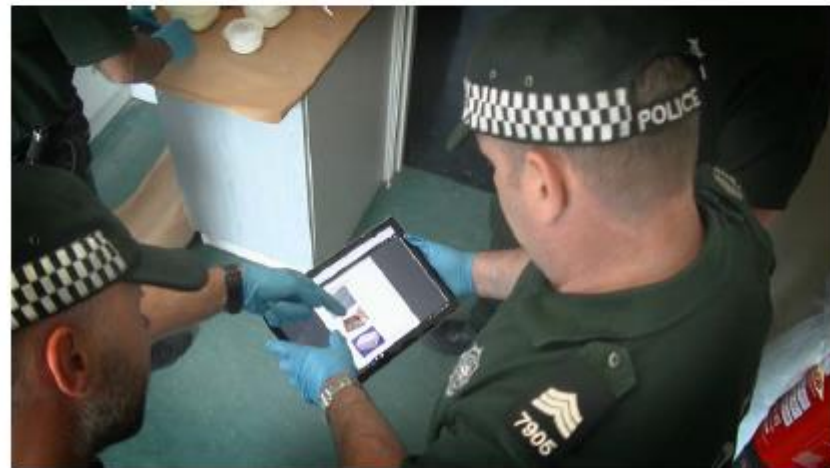
- Users Locations:** A world map showing user distribution with circular gauges for the United States (57% of users), United Kingdom (29% of users), and Bahrain (14% of users).
- Active Users:** A bar chart showing the number of posts for various users, with a list of top users below it:

User	Posts
htbnw2	8
offer_lovely	4
Kaitlyngirl1963	3
niitsitapii	2



HOMER Knowledge Management Platform

Desktop/Tablet version



Mobile version





Envisaged Impact

- Increase the security of Europe for citizens by exploiting information being transmitted on the internet to Predict and Prevent the use of HME through Attacking the Terrorist or Criminal Networks at a Strategic Level whilst Defeating the Device at a Tactical level utilising the tools developed.
- Through the development of tools work to reduce possible occurrences of events using HME by improving the capability of LEAs and Security Agencies to tackle the threat.
- Provision of sustainable solutions to continue to support and inform LEAs and Security Agencies beyond the life of the project to understand new and emerging threats.
- Improve security for the supply and distribution of fertilisers from manufacture to the field



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Thank you

For more information please visit: <http://www.homer-project.eu/>

<http://mklab.itι.gr>

Stefanos Vrochidis, stefanos@iti.gr