

# Aspects of Dual-Use in Defense Research

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# Major European Governmental Establishments on Defense Research

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1. Defence Science and Technology Laboratory DSTL [GBR]
2. French National Aerospace Research Center ONERA,  
Centre national d'études spatiales CNES and  
Centre d'électronique de l'armement CELAR [FRA]
3. Netherlands Organisation for Applied Scientific Research TNO –  
Core Area Defense, Security and Safety [NLD]
4. Research Establishment for Applied Science FGAN [DEU]
5. Fraunhofer Society – Group Defense and Security [DEU]
6. Institut Franco – Allemand de Recherche - ISL [DEU / FRA cooperation]
7. Swedish Defence Research Agency FOI [Sweden]
8. Norwegian Defence Research Establishment FFI [Norway]

+ Industrial Research  
Labs (e.g. Qinetiq)

research co-operations  
ET, TG, demos etc.

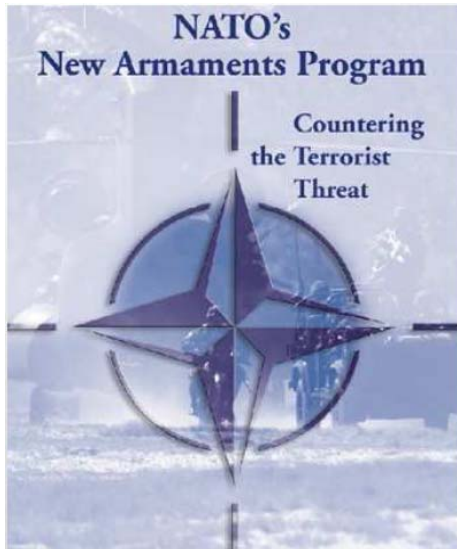
+ Research Universities  
(military & civil)



# NATO Program of Work on Defense against Terrorism

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Goal: To enhance the ability to identify, develop and transition effective technologies to war fighters and first responders such as policemen, firefighters, and emergency workers on the front lines of the struggle against global terrorism.



1. Technology for intelligence, reconnaissance, surveillance and target acquisition of terrorists [DEU]
2. Protection of harbors and ports [ITA]
3. Protection of large-body aircraft against man-portable air defense systems [GBR]
4. Protection of helicopters from rocket propelled grenades [BGR]
5. Countering improvised explosive devices [ESP]
6. Precision air drop technology for special operations forces [USA]
7. Detection, protection and defeat of CBRN weapons [FRA]
8. Explosive ordnance disposal and consequence management [SVK]
9. Defense against mortar attacks [NLD]
10. Critical infrastructure protection [BEL]



Federal Ministry  
of Education  
and Research



Federal Ministry  
of Defence



Federal Ministry  
of Transport, Building  
and Urban Affairs

## Scenario oriented security research

1. Protection and rescue of persons
2. Evacuation techniques
3. Detecting explosives
4. Protection against failure of supply infrastructures
5. A false sense of security – how safe is safe
6. Protection of transport infrastructures
7. Avoiding cascade effects
8. Securing the supply chains



Bundesministerium  
für Bildung  
und Forschung



Bundesministerium  
der Verteidigung





Bundesministerium  
für Verkehr, Bau  
und Stadtentwicklung

## Technology oriented security research

1. Integrated protection systems for policemen, firefighters, and emergency workers
2. The fire service of the future
3. Multi-sensor systems for chemical, biological, nuclear, radiation, and explosive (CBNRE) risks
4. Nanotechnologies in the battle against bioterrorism
5. Pattern recognition
6. Biometry for personal identification
7. Reconnaissance robots
8. Biometrics

# Cross-reference table for both programs

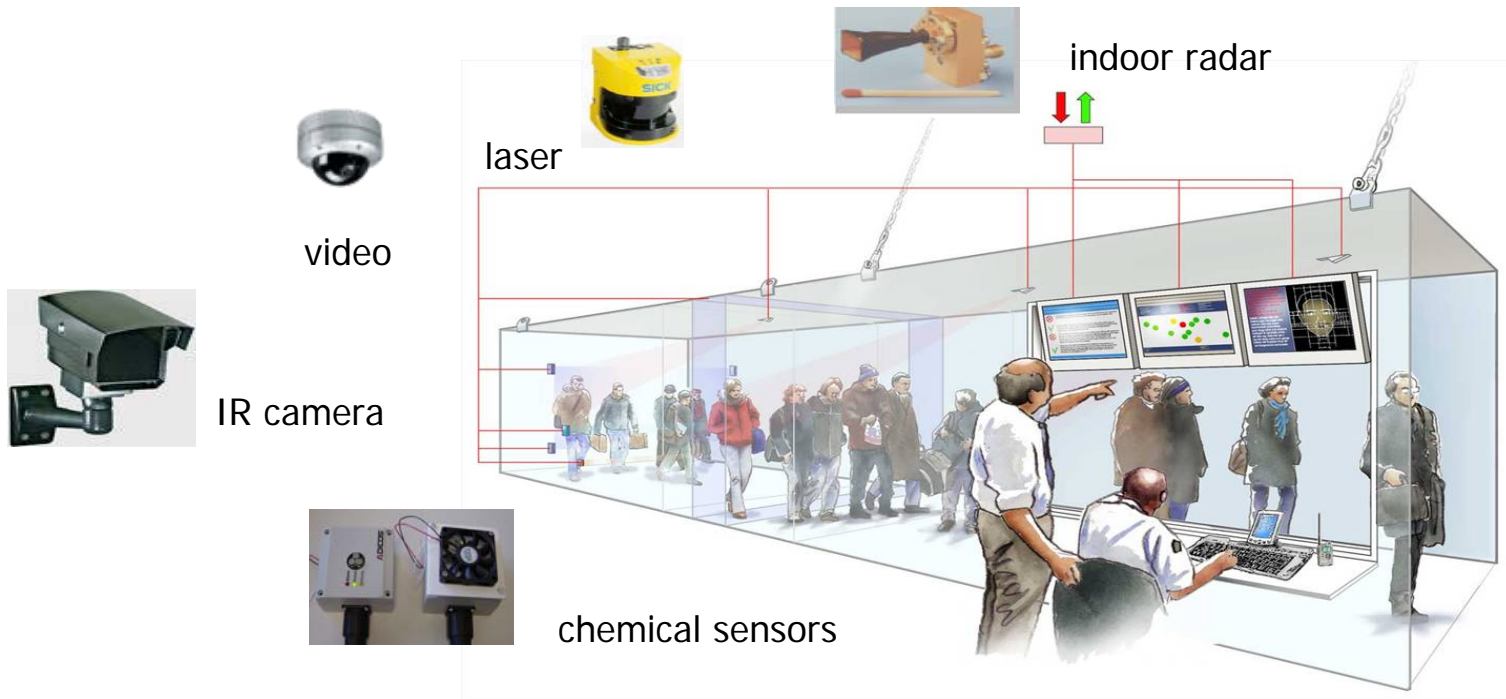
		Scenario oriented security research								Technology oriented security research							
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 <b>NATO Program of Work on Defense against Terrorism</b>	1. Protection of large-body aircraft				X		X	X	X								
	2. Protection of harbors and ports				X		X	X	X								
	3. Protection of helicopters						X	X	X								
	4. Countering improvised explosive devices			X													
	5. Precision air drop technology																
	6. Detection, protection of CBRN weapons			X					X			X				X	
	7. Technology for RISTA of terrorists										X		X		X		
	8. Explosive ordnance disposal																
	9. Defense against mortar attacks	X						X									
	10. Critical infrastructure protection				X		X	X	X								

# Technology Example for Dual-Use: Multiple Sensor Data Fusion

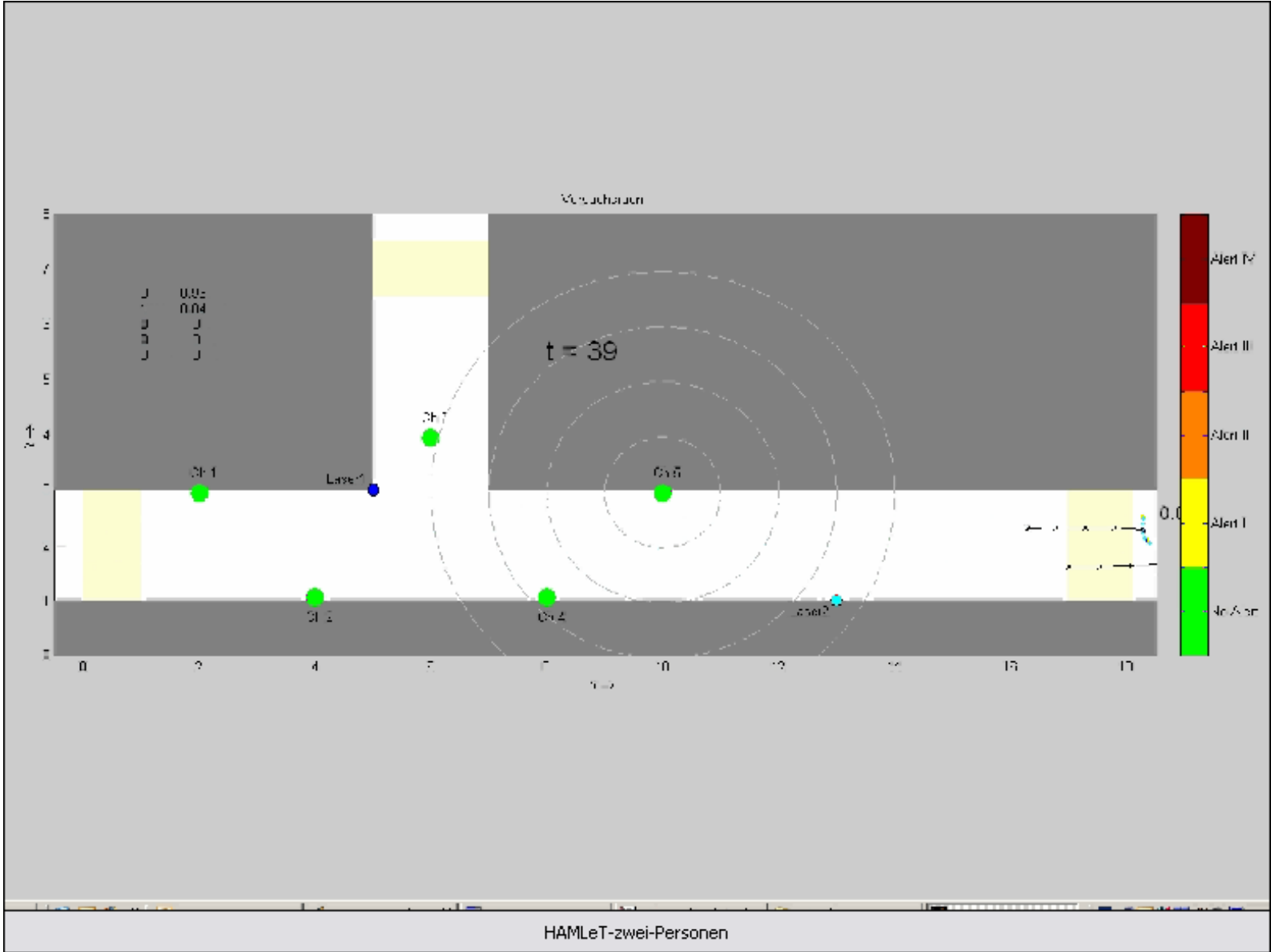
## Detection of persons and hazardous items with a high damage potential (EU PASR 2006 Project HAMLLeT)

Exploit strengths of specific specialized sensors in complex indoor scenarios to track and classify potentially threatening individuals in a person stream.

Assistance: Avoid fatigue in situations with low frequency of suspicious events



# Video Example: Person Tracking and Dynamic Threat Classification



# Conclusions

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- Although the resources in defense research in Europe are not large there are many world-class experts who can (and already do) make important contributions to the development of novel security technologies in Europe.
- The NATO Program of Work on Defense against Terrorism and the German Research Program on Civil Security have some research topics in common such as protection of infrastructures and RISTA of terrorists and therefore knowledge exchange and dual-use of technology should be intensified.
- Tracking of persons and dynamic threat identification is an application area which already greatly benefits from methods and tools of defense research on sensor networks and data fusion. This knowledge transfer increases the competitiveness of European firms in the security market and is already an important contribution of defense researchers to security in Europe.