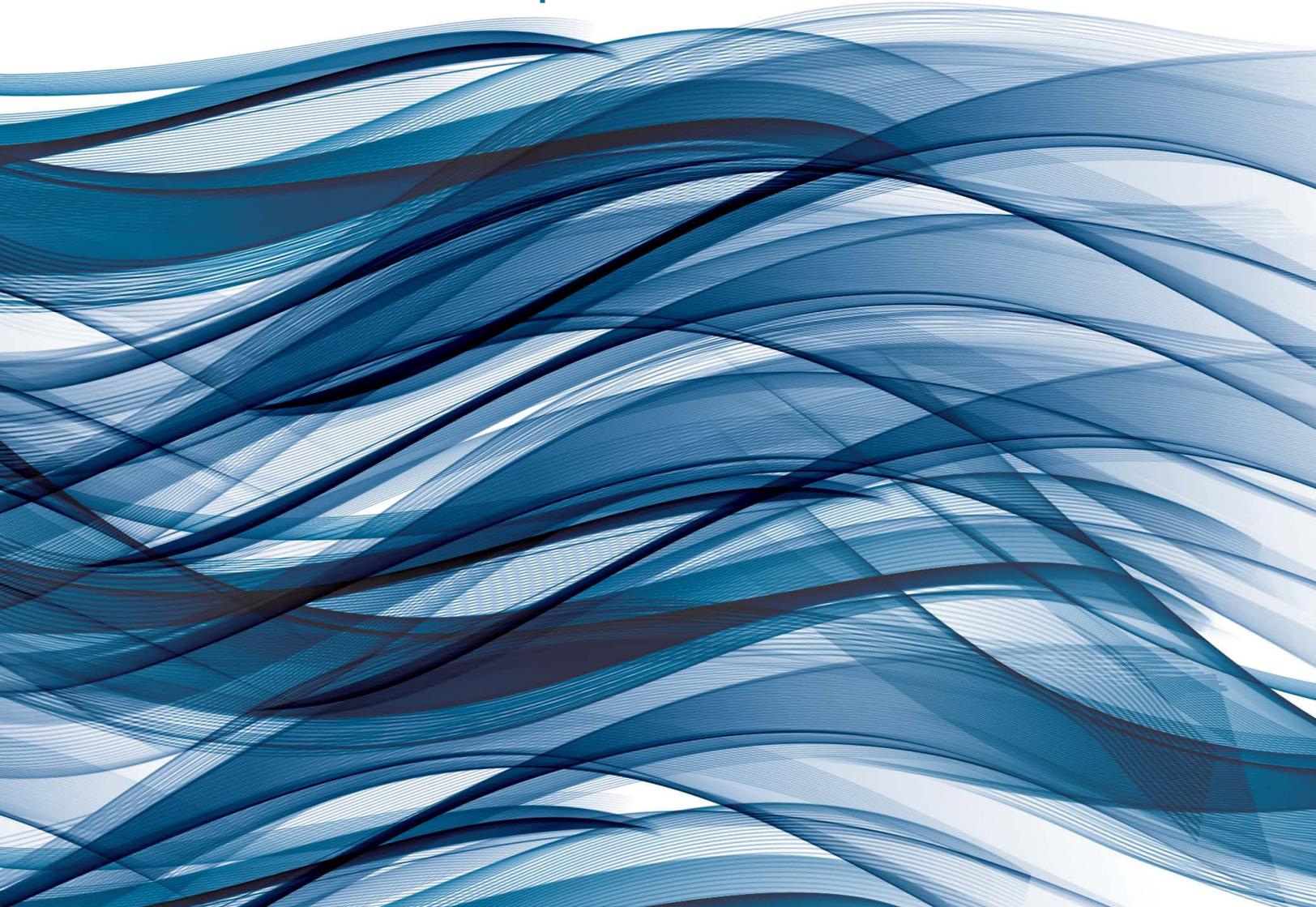




Newsletter #7  
September 2018

# RANGER

**R**Adars for lo**NG** distance maritime surveillance**E**  
and Search and Rescue op**R**ations



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Dear Readers,

Welcome to the seventh issue of the RANGER newsletter.

RANGER is a 42-month European project, co-funded by the European Union’s Horizon 2020 research and innovation programme. The consortium comprises 10 partners from 7 countries, in Correction: a balanced blend of Radar technology industrial organizations, academic/research institutes, high-tech SMEs, and highly relevant end-user organizations. RANGER combines innovative Radar technologies with novel technological solutions for early warning, in view of delivering a surveillance platform offering detection, recognition, identification and tracking of vessels, beyond current radar systems’ capabilities, thus drastically improving the response and intervention capacity of European Search and Rescue operations.

**This issue features an article about the RANGER project’s integration testing activities. It also includes project news and updates as well as related conferences & events.**

Enjoy reading and don’t forget to visit our [website](#) for more information!

The Project Coordinator



## For more Information

Please visit the RANGER website [www.ranger-project.eu](http://www.ranger-project.eu)

You can also keep up with more of what is happening at RANGER project by following us on:



## A lecture delivered during an one day workshop at the Communication & Electronic Military Signal Officers School on “RANGER project – Enhancing maritime surveillance operational capabilities”

(15 May 2018, Haidari, Greece)

On Tuesday 15th of May 2018 during a workshop event, hosted in “Communication & Electronic Military Signal Officers School” premises an hourly lecture concerning “RANGER” platform was given by Mr. Vasileios Papadopoulos.

Mr. Vasileios Papadopoulos, discoursed on the scope and the innovations that RANGER brings on the light and stressed on the use in critical areas such as crime prevention, Search And Rescue (SAR) operations in the Mediterranean Sea. Although the lecture was a small part of the workshop, the interest of the audience and the number of questions asked, kept the presenter for two hours on the floor.

As an introduction, the speaker provided general information about the EU funded projects that MoD, Greece participates. Then RANGER project was presented and analyzed. References on the pressing issues about human trafficking, smuggling, merchandize and current migration crisis, in the Mediterranean Sea, were made such as to show the need and the connection of RANGER project. Special emphasis was put on capabilities of the RANGER platform in comparison with the present maritime surveillance radar systems. Technology innovation of RANGER system and expected impact on Maritime Surveillance Operations but also the change of modus operandi in irregular migration prevention, SAR, were in more details what it was presented. It was obvious that by the end of the workshop the audience had a clear view on how the research program was managed and how it is supposed to contribute in EU border security.

The audience was composed of postgraduate students of NKUA, professors of Panteion and National and Kapodistrian University of Athens (NKUA), military personnel involved in border surveillance and administrative personnel of MoD, Greece.





## RANGER Technical Meeting at ICCS

(16-17 May 2018, Athens, Greece)

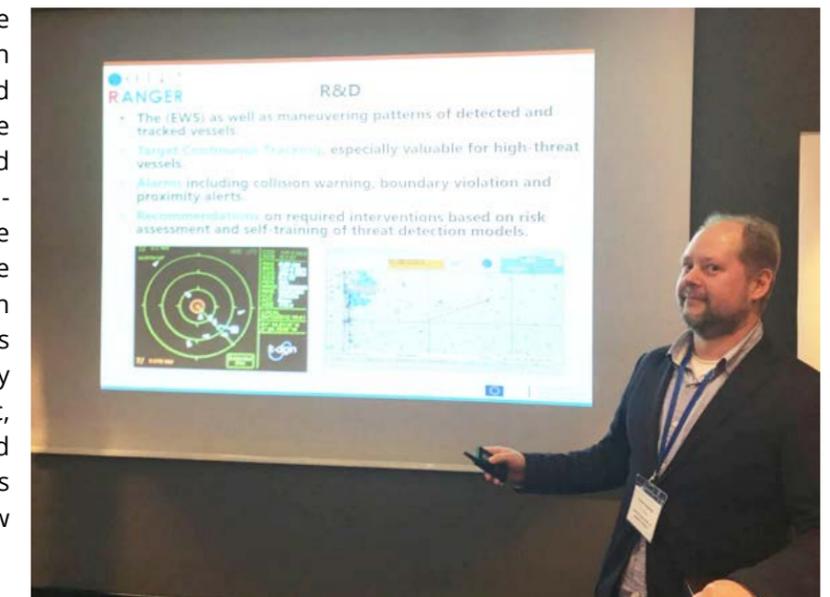
Several experts of the RANGER consortium met at ICCS premises in Athens, Greece for a project technical meeting to discuss and arrange the necessary preparations for the integration and pilot demonstration activities. Specifically, meeting participants discussed in detail the status and interdependencies of the developments of the different RANGER platform components, the deployment and integration aspects as well as the pilot scenarios and logistics for the installation works. The meeting concluded successfully and set the short-term action plans and milestones for the integration and testing activities of the next period.

## Participation of the RANGER project at “Maritime Search and Rescue 2018: Developing Capabilities for SAR Operations” conference

(22 May 2018, Helsinki, Finland)



RANGER participated in Maritime Search and Rescue 2018 event on Helsinki, Finland on 22nd May, and performed a presentation of the project advances for a distinguished audience of European and North-American professionals of maritime search and rescue. This year, the focus of the Conference was on increasing capabilities for operations in austere environments. Especially in the Arctic, increasing vessel traffic, developments in technology and extreme environmental conditions force many response units to review and increase their SAR capabilities.



The aim of the event was also to give the maritime SAR professionals an opportunity to discover innovative systems and capabilities to improve preparations for rescue operations, including but not limited to oil spills and mass rescue. In this later, the presentation of RANGER and the developing radar technologies (OHT and MIMO) along with Early Warnings, Data fusion and Machine Learning, draw the attention of the participants. Other subjects of the presentation, prepared by Mr. Tuomas Tammilehto from Laurea University of Applied Sciences and Mr. Vasileios Papadopoulos from the Hellenic Ministry of Defence, were the changes in SAR operational environment when the capability to detect small vessels from a much wider area increases. For example, the way of performing searches would change when vessels in stress and in need of help could be detected from a much longer distance than today.

The audience was very interested in the outcomes of RANGER and most of the questions raised had to do with the cost-efficiency of the proposed technologies. The presentation is available [here](#)



### RANGER at “Posidonia 2018”

(4-8 June 2018, Athens, Greece)

The “Posidonia 2018” shipping exhibition took place in Athens from 4 to 8 June 2018, constituting the most important shipping exhibition in the world. The exhibition was held at Athens Metropolitan Expo with the participation of more than 1.900 companies from 92 countries. New ideas, services and innovative products were presented in the exhibition and HMoD demonstrated its technological achievements at the stand of the Hellenic Navy with the public turnout exceeding 1.000 people.



The visitors of the exhibition had the opportunity to be briefed by HMoD personnel of proper expertise on the European programmes managed by the Directorate for the Management of European and Development Programmes and materialised by the most capable members of the General Staff. Visitors

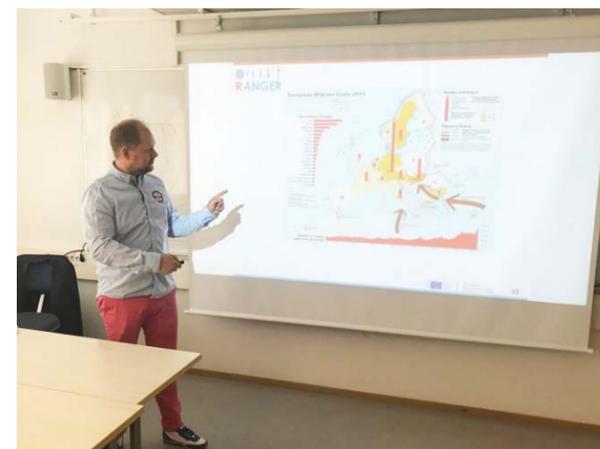
were briefed in detail, on the research programme “RANGER”.

Mr. Vasileios Papadopoulos presented at the stand of the Hellenic Navy the Technology innovation, the capabilities of the RANGER platform but also the expected impact on Maritime Surveillance Operations, human trafficking, smuggling, merchandize, irregular migration prevention and SAR operations.

### Second lecture on ‘RANGER project- Enhancing border security and crime prevention capabilities at the Mediterranean Sea’ delivered at the Laurea University

(13 June 2018, Helsinki, Finland)

On the 13th of June, 2018 Mr. Tuomas Tammilehto gave a lecture on methodological difficulties of showing value creation of RANGER. Donald Rumsfeld has a famous quote in which he highlights the problem of uncertainty and the nature of knowing: “[...] as we know, there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know.” Another, famous person, physician Niels Bohr, is known for his quote: “It is very hard to predict, especially the future.” These two quotes were central in Tuomas Tammilehto’s lecture on RANGER at Laurea University of Applied Sciences. Why? Tuomas highlighted the methodological difficulties of research on a topic such as RANGER, especially related with the worst humanitarian disaster



touching Europe since the Second World War: the immigration crisis. Since RANGER is about making an impact, it is pertinent to demonstrate that the technological advances of RANGER are translating to human lives saved. And here lies the challenge that Tuomas was pinpointing to the students: What

can we do when data of drowned immigrant is distorted, limited, or absent altogether? How can we then analyse technology’s impact? How can we show the value creation in practice? Tuomas and the students examined different ways to reach the goal using criminological methods and theories. We know that RANGER will have an impact, and we know that we don’t fully know what that impact will be. With the fresh eyes of young students, we know that the unknown unknowns will remain unknown, but maybe there are fewer.

### RANGER at FRONTEX Workshop on EU funded security projects

(14 June 2018, Warsaw, Poland)

A general overview of the RANGER project was presented in the annual FRONTEX Workshop on EU funded security projects by the project’s coordinator Mr. Dimitris

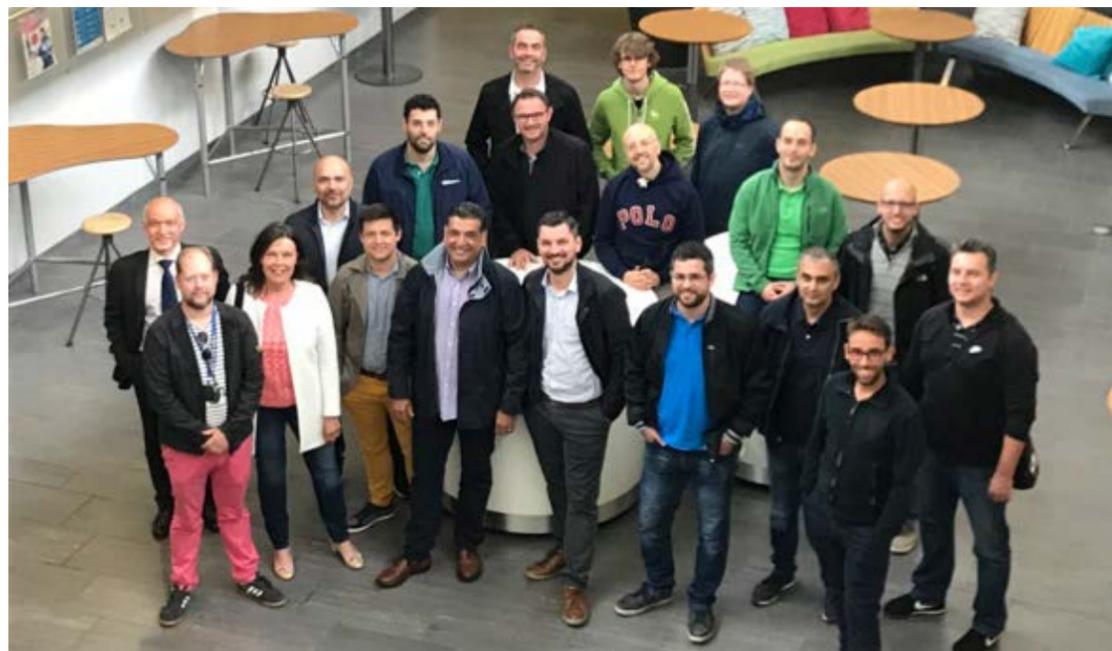


Katsaros on the 14th of June 2018 on Warsaw, Poland. The aim of this workshop dedicated to the border security EU funded projects was

not only to present to the targeted audience the RANGER project, but also to discuss with border guard community and receive their valuable feedback.



**RANGER Plenary and Integration meeting**  
(3-5 July 2018, Helsinki, Finland)



The fourth plenary meeting of the RANGER consortium was hosted by LAUREA and was held on the 3<sup>rd</sup> -5<sup>th</sup> of July in Helsinki, Finland. During the plenary meeting, the consortium had the chance to discuss the outcomes of the last period within each Work Package of the project separately and plan the

activities of the months to come. The presentations were followed by active discussions between the partners about the future actions. The successful plenary was followed by a very productive integration meeting which was dedicated to the integration tests and their valuable results on the third day.

**RANGER project at FUSION 2018**  
(10-13 July, 2018 Cambridge, UK)



RANGER project's partners from NATO-CMRE participated in the 21st International Conference on Information Fusion, which was held in Cambridge, UK on 10-13 July 2018 and presented two technical papers. The first entitled "Belief Propagation Based AIS/Radar Data Fusion for Multi-Target Tracking" by Mr. Domenico Gaglione,

Mr. Paolo Braca and Mr. Giovanni Soldi and the second, under the title "Online Estimation of Unknown Parameters in Multisensor-Multitarget Tracking: a Belief Propagation Approach" by Mr. Giovanni Soldi and Mr. Paolo Braca.

**RANGER lectures at Technische Universität Dresden**  
(30 July-2 August 2018, Dresden, Germany)



In the occasion of the 23rd CCN Workshop, which was held from 30th of July to 2nd of August 2018 at Technische Universität Dresden (TUD), RANGER partners from TUD Mr. Niko Joram and Mr. Adrian Figueroa delivered two presentations related to the RANGER project.

from the Faculty of Electrical Engineering and Information Technology had the opportunity to attend the seminars, which were all related to circuits and systems. Mr. Niko Joram presented the '[RANGER Antenna Design](#)' and Mr. Adrian Figueroa's presentation was under the title '[MIMO Radar Status Project RANGER](#)'

About 50 graduate and postgraduate students

## RANGER project's integration testing activities

By Lazaros Karagiannidis, ICCS

One of the most important tasks in large and complex systems such as RANGER is the integration testing process prior to the final deployment and demonstration of the system as a whole. Therefore the RANGER consortium elaborated a complete set of integration testing activities in order to validate the interactions between the different RANGER modules. In addition, this action took place in the early stages of the development process in order technical partners to identify any errors and/or needs for improvement and in parallel to verify the conformity of the different modules as a whole to the system requirements of the RANGER platform.

After the successful technical meeting in Athens (16th-17th May 2018), where all technical aspects with regards to data flows, data formats and data exchange, communication interfaces, development status, deployment options etc. were thoroughly discussed, documented and it was time to proceed to the next step.

An integration test plan was elaborated after the technical meeting, which include among others interface testing, component testing, integration testing etc. During the integration test meeting that took place in conjunction with the 4th RANGER Plenary meeting in Espoo/Helsinki, Finland (3rd to 5th July 2018) a variety of different tests were successfully performed.

The different SW modules of the RANGER platform were deployed locally at Laurea University or were connected remotely to the RANGER test network. The procedure followed was to split the different data flows into consecutive small tests, proceeding with more extended and end-to-end tests, thus validating the whole data flow chain. As data inputs, captured data were used from OTH radar, MIMO Radar prototype as well as Greek AIS/

Legacy and French AIS. With regards to the OTH radar, we had the opportunity to have live remote connection to the OTH radar installed in France providing live feeds from AIS and OTH radar tracks. The current version of the Advanced User Interface (AUI) was also demonstrated and its main features were tested. The internal components of the RANGER intelligence consisting of the Early Warning Engine (EWE), the data storage, the Data Fusion and Machine Learning module and their internal communications and processes were successfully tested. The Uniform Communication Gateway (UCG), which acts as the interoperability layer of the RANGER platform providing uniform data exchange, data translation and data services was successfully tested with different types of data sources (OTH tracks, MIMO tracks, AIS and Legacy).

The test revealed also some errors that were successfully identified, analyzed and addressed. Ideas for further improvements were also discussed and agreed for further actions. The most valuable aspect of the integration test meeting was that all partners have a clear vision of the RANGER platform as a whole, its functionalities and interactions of the different subsystems.

For the successful demonstration during the first pilot in France, there is still a lot of work to be performed. The action plans have been further refined, remote integration test session have been agreed and planed. Logistics and installation preparation activities have been progressed since the last meeting.

The 1st phase of the French pilot demonstration in October 2018 is approaching, and all consortium partners are committed to work collaboratively towards the successful completion of this significant milestone of the project.



### Milipol 2019

Paris, France 19-22 November 2019

<https://en.milipol.com/Exhibiting/Estimating-your-participation-Milipol-Paris-2019-Homeland-Security>



### Maritime Security & coastal surveillance 2018

27-28 November 2018 Singapore, Asia

<https://coastalsurveillancemda.iqpc.sg/>



### ICCE 2019

Las Vegas, USA 11-13 January 2019

<http://www.icce.org/>



### IEEE International Solid State Circuits Conference ISSCC 201

17-21 February 2019, San Francisco

<http://isscc.org/>



### 13th Conference on Antennas and Propagation

31 March-5 April 2019 Krakow, Poland

<http://www.eucap2019.org/>



### IPSN 2019

Canada 16 April 2019

<https://ipsn.acm.org/2019/index.html>



### Sea-Air-Space 2019

6-8 May 2019 Washington DC, USA

<http://www.seaairspace.org/about/future-dates>



### Maritime Search & Rescue Conference

14-16 May 2019 Tallinn, Estonia

<http://maritime-sar.com/>



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## For more Information

Please visit the RANGER website

[www.ranger-project.eu](http://www.ranger-project.eu)

You can also keep up with more of what is happening at RANGER project by following us on:



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## THE CONSORTIUM



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