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Communication, Dissemination and Exploitation Report

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Abstract

Throughout the duration of the SINet project several activities concerning communication, dissemination and exploitation took place. These include not only the presentation of research results but also the importance of H2020 Marie Curie Actions in the scientific community. This report summarises such activities and updates Deliverable 3.2.

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1 Introduction

This report presents the communication activities, as well as dissemination and exploitation efforts undergone during the two years of the SINet project. They are presented in Sections 2 and 3 respectively, summarising each activity and providing links to external resources.

2 Communication Activities

The different communication activities were divided into two categories, social media/web and direct outreach to general audiences.

2.1 Web and Social Media

Most of the web-based communication activities are strongly based on SINet's website ¹. In its blog 10 publications were made available, including additional information about the project or links redirecting to other resources. In total, the website registered 2445 page-views from 60 different countries in the world as illustrated by Figure 2.1.

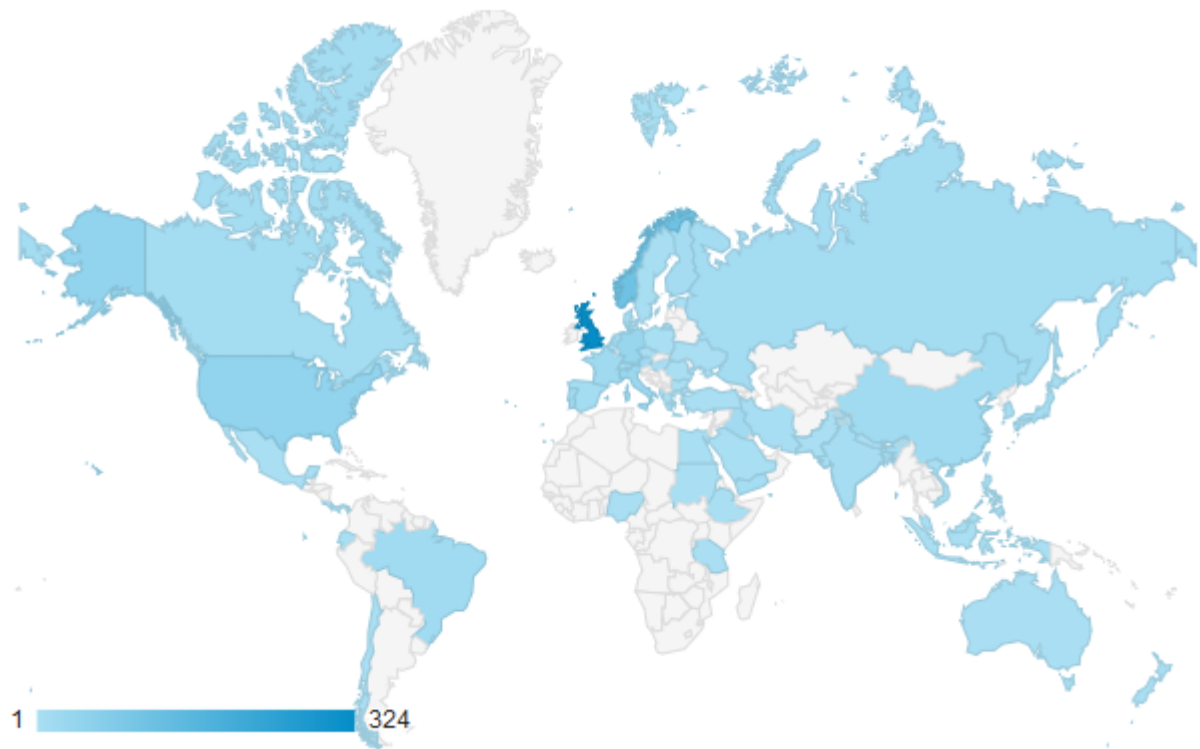


Figure 2.1: Website visitors around the world

The Twitter account connected to the SINet project² was used as a way to report additional updates, not reported on the website, and generic information, with a total of 50 tweets. These tweets include updates about ongoing project activities, Marie Curie actions and other information related with the subject of SINet.

¹<https://sinet.item.ntnu.no>

²https://twitter.com/SINet_MSCA

Additional web presence resulted from news and interviews not only related to research but also to societal issues and interests.

- Interview with Gemini NTNU&SINTEF regarding the proximity of IoT³;
- ERCIM news article on Machine Learning for resource-constrained IoT⁴;
- Interview to Euraxess Norway, presenting the view of mobility and research abroad, reflecting on my own experience with SINet⁵.

2.2 General Audiences Outreach

In the effort of closely engaging non-experts in research activities, the SINet project was present twice at the Researchers' Night in 2016 and 2017, at NTNU. In the first year it included a booth presenting the project's early results, research at the department of Telematics and a poster about mobility of researchers and Marie Skłodowska-Curie actions. In the second year, the participation was in the form of a short lecture about the life-cycle of an IoT device with a real demo.

³(in Norwegian) <https://gemini.no/2018/03/tingenes-internett-naermer/>

⁴<https://ercim-news.ercim.eu/en110/r-i/machine-learning-in-iot-for-autonomous-adaptive-sensing>

⁵<http://www.euraxess.no/norway/research-norway/excellent-assistance-all-practical-needs>

3 Dissemination and Exploitation

This chapter presents dissemination activities that concern the promotion of the results obtained by the project, focusing on, but not limited to, expert audiences or academia. Dissemination resulted both from presentations in different events and preliminary peer-reviewed publications. Another form of promotion has taken place through the publishing of bug reports in open-source software repositories. In particular, throughout SINet activities, bugs on the Linux kernel, two different CoAP implementations, Docker and Contiki have been reported. In this scope SINet has contributed with patches to fix the reported bugs, as well as improvements, which were later included in some of the main distributions (i.e. master branch).

Exploitation activities are focused on engaging industrial actors in order to adequately use SINet's results. These have limited visibility but nonetheless interest and future possibilities have been registered by contacts established with the industry. In particular, a meeting at Ericsson Poland is taking place soon after the end of the project with the goal of exploiting obtained results and addressing customers' pain-points. Additionally, exploitation of the acquired knowledge throughout the conducted research also targeted new research projects, with one successful outcome.

3.1 Dissemination Activities

The following list contains the venues where SINet was presented, discussing its goals and results, as well as the importance of Marie Skłodowska-Curie actions in the promotion of mobility between researchers. These activities were mostly focused on academic audiences, but also included the presence of the industry in some workshops.

- Github Repository¹ – (Academia and Industry)
- Presentation to visitors from Eurecom, NTNU – February 2018 (Academia)
- Invited talk at University of Porto as part of the MarineUAS ITN Winter School – January 2018 (Academia)
- Short presentation at the IoT Gemini Centre, Oslo – August 2017 (Academia)
- Invited talk at the University Centre in Svalbard (UNIS) – August 2017 (Academia)
- MSCA Ambassador at the IE Faculty, NTNU – May 2017 (Academia)
- Invited talk at University of Coimbra – December 2016 (Academia)
- Invited talk at University of Madeira – December 2016 (Academia)
- Presentation at the 2nd CleanSky ITN Conference, Trondheim, Norway – August 2016 (Academia)
- MSCA Ambassador at the IME Faculty, NTNU – May 2016 (Academia)
- Presentation at the SDN Workshop², Stavanger, Norway – May 2016 (Academia and Industry)
- Presentation at Gemini Workshop³, Trondheim, Norway – May 2016 (Academia and Industry)

¹<https://github.com/PalmaITEM>

²<http://cipsijoomla.uv.uis.no/2016.sdn/index.php>

³<http://www.sintef.no/en/ocean/initiatives/gemini-centre-for-maritime-communication/>

- Presentation at H2020 MSCA Workshop, NTNU, Norway – May 2016 (Academia)

The research work conducted in the scope of the SINet project has led to the interaction with researchers in different scientific fields. Aligned with the original SINet description, the multi-disciplinary nature of the project emphasised the cooperation with researchers in the fields of autonomous vehicles and satellites, even before the official start on the project. Additionally, the limited access to resources and networking challenges faced in the Arctic have also resulted in contributions to the Internet of Things and to IoT/Fog Computing in Healthcare.

The following publications have resulted from the work conducted in SINet:

- David Palma, A. Varnajotb, K. Dalenc, I. Basarand, C. Brunettee, M. Bystrowskaf, A. Korablina, R. Nowickih and T. Ronge, “Tourism in the Marginal Ice Zone: Challenges and Implications — An Interdisciplinary Perspective”, in *Polar Geography Journal (to be submitted)*;
- David Palma, Roger Birkeland, “Enabling the Internet of Arctic Things with Freely-Drifting Small-Satellite Swarms”, in *IEEE Global Communications Conference: Selected Areas in Communications: Satellite and Space Communications (submitted)*;
- David Palma, “Enabling the Maritime Internet of Things: CoAP and 6LoWPAN performance over VHF links”, in *IEEE Internet of Things Journal (accepted, under revision)*;
- A. Zolich, D. Palma, K. Kansanen, K. Fjortoft, J. Sousa, K. H. Johansson, Y. Jiang, H. Dong, T. A. Johansen, “Survey on Communication and Networks for Autonomous Marine Systems”, *Journal of Intelligent and Robotic Systems*, 2017;
- A. Varnajot, A. Korablina, A. Bazhenova, A. Mischenko, B. Schartmüller, B. Niraula, C. Brunette, D. Palma, D. Poudel, E. Sukhikh, E. Guk, H. Kauko, I. Basaran, K. Dalen, L. Griem, L. Nikanorova, M. Antonova, M. Årthun, M. L. Bystrowska, M. Korhonen, R. Nowicki, S. Teigen, T. Ronge, “The Arctic Ocean and the Marginal Ice Zone (MIZ)”, *Norwegian Scientific Academy for Polar Research, Longyearbyen, Svalbard* 2017;
- R. Birkeland, David Palma, “Freely-drifting Small-Satellite Swarms for Maritime Sensor Networks in the Arctic”, in *Proc. of Advances in Intelligent Systems and Computing, ICICT 2018*;
- F. A. Kraemer, D. Ammar, A. E. Braten, N. Tamkittikhun, David Palma, “Solar Energy Prediction for Constrained IoT Nodes Based on Public Weather Forecasts,” in *ACM International Conference on the Internet of Things*, October 2017;
- David Palma, A. Zolich, Y. Jiang, T. A. Johansen, “Unmanned Aerial Vehicles as Data Mules: An Experimental Assessment”, in *IEEE Access*;
- R. Birkeland, A. Zolich, D. Palma, “Integrated SmallSats and Unmanned Vehicles for Networking in Remote Locations”, *68th International Astronautical Congress*, September 2017;
- F. A. Kraemer, A. E. Braten, N. Tamkittikhun, D. Palma, “Fog Computing in Healthcare – A Review and Discussion”, *IEEE Access*;
- A. Zolich, D. Palma, R. Birkeland, Y. Jiang, “A multi-hop intermittent wireless sensor network with unmanned aerial vehicles and satellite links for the Arctic”, *Remote Controlled and Autonomous Measurement Platforms Flagship (ReCAMP) Workshop*, April 2016, Tromsø, Norway.

3.2 Exploitation

The exploitation of SINet results has been focused on ensuring the continuation of research activities related to networking in challenging and resource constrained environments. In order to achieve this goal, I have contacted different potential partners, presenting concepts related to SINet in face-to-face meetings, conference calls and dedicated events. The main outcome from these endeavours was the successful acceptance of the ART research project, involving colleagues from multi-disciplinary areas at NTNU.

The following list includes the main exploitation activities:

- Meetings with Ericsson Poland and discussions regarding the creation a startup company about the use of unmanned vehicles for IoT support in remote locations;
- Organised “AI/ML and Networking” seminar with the participation of Telenor, Uninett and Hafslund;
- Accepted research project, ART — Autonomous Resource-Constrained Things (Norwegian Research Council, IKTPLUS);
- Meetings with Tieto Finland and IBM Norway regarding the autonomous management of resource-constrained networks;
- Presentation of a research proposal for resource-constrained IoT devices at ICTurkey 2016, Turkey;
- Presentation of SINet at the KID workshop at NTNU (October 2016) with more than 10 companies in the audience, including Nordic Semiconductor, Telenor and Statoil.

SINet

The SINet project

April 30, 2018

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