

Preface

It is with great pleasure that I welcome you to the final book on the Embedded Systems Institute project POSEIDON. The project was funded under the Dutch BSIK program “Embedded Systems.” The project partners were the Embedded Systems Institute (ESI), Thales Netherlands, Noldus Information Technology, Delft University of Technology, Eindhoven University of Technology, University of Amsterdam, Tilburg University, and VU University Amsterdam. The project started in June 2007, ended in May 2012, and encompassed an overall volume of 84 fte.

As for all of ESI’s large projects, POSEIDON has followed the by now well-known Industry-as-Laboratory paradigm, in which scientific research is performed in the context of an industrial case. For POSEIDON, the case was defined in the context of the new emerging market of support systems for maritime safety and security. The POSEIDON partners addressed a variety of research topics ranging from integration and testing to systems-of-systems, from visualization to security, from vessel trajectory segmentation to adapter generation, and from situation awareness to trustworthy information interoperability.

The POSEIDON project has been highly successful. Among the results we count the following highlights:

- An architectural framework for information-centric systems of systems and an integrated demonstrator, showing how the combination of many new technologies can be applied to offer improved system support to coast guard operators for a higher level of situation awareness.
- An extendable method to analyze and visualize the kinematic behavior of moving objects. This method offers powerful solutions for the construction of user-defined operational pictures in next-generation maritime systems.
- A highly efficient data reduction method resulting in vessel trajectories using only 2 % of the original amount of data.
- A formal definition of a semantic concept hierarchy of maritime information, enabling automatic reasoning on semantic level with maritime concepts, implemented in a knowledge base.

- A new method for trust management and distributed access control for use in a systems-of-systems environment in the absence of a central security authority.
- Concepts and techniques for systems integration and acceptance at runtime: systems join-and-leave, runtime acceptance testing, and system health diagnosis.
- Adaptor generation techniques for the quick realization of reliable connections between systems.
- A method for runtime anomaly detection by mining of semantic information about ship movements.
- Strong cooperation between universities resulting in a number of shared publications.
- Over 100 scientific and professional publications and PhD. and MSc. theses.

All partners in the project are satisfied with the results achieved in the POSEIDON project. Some of the results and insights obtained in POSEIDON will find their way in the Thales Netherlands product portfolio. Other achievements have found their way to the portfolio of projects that ESI is executing together with industrial and academic partners, including the successor project METIS, where new research topics are tackled that were instigated by POSEIDON.

I would like to thank all project participants for their commitment and contributions: as a team they have turned POSEIDON into a success! The support of Thales Netherlands and the Dutch Ministry of Economic Affairs (now EL&I) through AgentschapNL is gratefully acknowledged. We also thank Springer for their willingness to publish this book. With this book, we expect to share the important results achieved with a larger, worldwide audience, both in industry and academia.



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