

Preface

This book marks the end of the Dutch BSIK Falcon project, addressing the model-driven development of automated logistic systems. In particular, the warehouse and distribution systems as developed by Vanderlande Industries, a leading supplier of integrated logistics systems for automation of warehouses, were selected as Falcon's carrying industrial case.

This book is the sixth in a series of books, all reporting on the large 5-year industry-as-laboratory projects, as executed by the Embedded Systems Institute (ESI), in close collaboration with its industrial and academic partners.²

The Falcon project was executed from October 2006 until September 2011. It was carried out by a consortium consisting of the Embedded Systems Institute, Vanderlande Industries, Demcon Advanced Mechatronics, Delft University of Technology, Eindhoven University of Technology, Eurandom, the University of Twente, and Utrecht University, and lead by ESI, together encompassing 95 FTE.

Falcon focuses on model-driven development within the context of warehouse automation with a specific emphasis on warehouse control and enabling technologies for the automation of warehouse functions. Model-driven development provides a means to handle increased system complexity by focusing on the problem domain instead of the solution domain. It is a development approach that focuses on creating models and system abstractions, as a means to increase productivity and quality by simplifying design processes and supporting design decisions, whilst promoting communication between all parties involved.

The Embedded Systems Institute has, in its previous projects, already shown the benefits of model-driven development in several other domains. The Falcon project adds a new domain by successfully applying this approach to the design of warehouses, robotic warehouse components, and warehouse management and control systems. Key results of the project include highly modular reference architectures that support the model-driven development of warehouse management and control

² The books of the earlier industry-as-laboratory projects Boderc, Tangram, Ideals, Trader, and Darwin are available on ESI's website: <http://www.esi.nl/publications/books/>.

systems; simple aspect models that effectively guide the development of new warehouse concepts or the configuration of new warehouse systems; a versatile automated item-picking workstation integrating a novel underactuated robot hand and new item recognition and localisation algorithms; and a scalable and robust shuttle-based transportation system with similar performance as conventional conveyor-based transportation systems.

I would like to thank the participants of the Falcon project for their commitment and contributions to the project: together they have secured Falcon's success. The financial support by Vanderlande Industries and the Dutch Ministry of Economic Affairs (through AgentschapNL) are gratefully acknowledged. I would also like to thank Springer for their willingness to publish this book, with which the Embedded Systems Institute wishes to share the most important results of the Falcon project with a broad audience, in both industry and academia.



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