



Technologien für die intelligente Automation
Technologies for Intelligent Automation

Oliver Niggemann
Jürgen Beyerer *Editors*

Machine Learning for Cyber Physical Systems

Selected papers from the international
Conference ML4CPS 2015

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Ziel der Buchreihe ist die Publikation neuer Ansätze in der Automation auf wissenschaftlichem Niveau, Themen, die heute und in Zukunft entscheidend sind, für die deutsche und internationale Industrie und Forschung. Initiativen wie Industrie 4.0, Industrial Internet oder Cyber-physical Systems machen dies deutlich. Die Anwendbarkeit und der industrielle Nutzen als durchgehendes Leitmotiv der Veröffentlichungen stehen dabei im Vordergrund. Durch diese Verankerung in der Praxis wird sowohl die Verständlichkeit als auch die Relevanz der Beiträge für die Industrie und für die angewandte Forschung gesichert. Diese Buchreihe möchte Lesern eine Orientierung für die neuen Technologien und deren Anwendungen geben und so zur erfolgreichen Umsetzung der Initiativen beitragen.

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Oliver Niggemann • Jürgen Beyerer (Eds.)

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Editors

Oliver Niggemann
inIT - Institut für industrielle Informations-
technik
Hochschule Ostwestfalen-Lippe
Lemgo, Germany

Jürgen Beyerer
Fraunhofer-Institut für Optronik
Systemtechnik und Bildauswertung
Karlsruhe, Germany

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Preface

Data is the coming resource of the 21st century, e.g. the market capitalization of Google has already achieved almost the value of Exxon Mobil. In the future, this trend will continue for Cyber Physical Systems: E.g. globally connected production systems optimize automatically their energy consumption (keyword: Industrie 4.0), cars react dynamically to the driving behavior of other road users and trains detect wear effects beforehand.

This huge amount of generated data leads to completely new and unresolved challenges for data analysis and machine learning: McKinsey estimates that almost 2 Exabyte of new data were generated in the manufacturing industry in 2010. The amount of data prohibits any manual analysis, e.g. by classical data scientists.

The solution can only be the use of highly automated machine learning methods. But most of these methods do not consider peculiarities of technical systems: The dynamic time behavior is not modeled, control signals and the resulting behavior changes of hybrid systems are not captures and physical knowledge is not used.

Therefore the conference ML4CPS aims at bringing experts from science and industry together to discuss current demands on machine learning for Cyber Physical Systems and match them with recent results from the scientific community.



Prof. Dr. rer. nat. Oliver Niggemann



Prof. Dr.-Ing. habil. Jürgen Beyerer