1. Record Nr. UNINA9910433248603321

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Titolo	Machine Learning for Cyber Physical Systems : Selected papers from the International Conference ML4CPS 2020 / / edited by Jürgen Beyerer, Alexander Maier, Oliver Niggemann
Pubbl/distr/stampa	Berlin, Heidelberg : , : Springer Berlin Heidelberg : , : Imprint : Springer Vieweg, , 2021
ISBN	3-662-62746-9
Edizione	[1st ed. 2021.]
Descrizione fisica	1 online resource (VII, 130 p. 42 illus., 25 illus. in color.)
Collana	Technologien für die intelligente Automation, Technologies for Intelligent Automation, , 2522-8587 ; ; 13
Classificazione	COM043000TEC007000TEC041000
Disciplina	621.38
Soggetti	Cooperating objects (Computer systems) Telecommunication Computer engineering Computer networks Cyber-Physical Systems Communications Engineering, Networks Computer Engineering and Networks
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Preface -- Energy Profile Prediction of Milling Processes Using Machine Learning Techniques -- Improvement of the prediction quality of electrical load profiles with artficial neural networks -- Detection and localization of an underwater docking station -- Deployment architecture for the local delivery of ML-Models to the industrial shop floor -- Deep Learning in Resource and Data Constrained Edge Computing Systems -- Prediction of Batch Processes Runtime Applying Dynamic Time Warping and Survival Analysis -- Proposal for requirements on industrial AI solutions -- Information modeling and knowledge extraction for machine learning applications in industrial production systems -- Explanation Framework for Intrusion Detection -- Automatic Generation of Improvement Suggestions for Legacy, PLC Controlled Manufacturing Equipment Utilizing Machine Learning -- Hardening Deep Neural Networks in Condition Monitoring Systems

against Adversarial ExampleAttacks -- First Approaches to Automatically Diagnose and Reconfigure Hybrid Cyber-Physical Systems -- Machine learning for reconstruction of highly porous structures from FIB-SEM nano-tomographic data.

Sommario/riassunto

This open access proceedings presents new approaches to Machine Learning for Cyber Physical Systems, experiences and visions. It contains selected papers from the fifth international Conference ML4CPS – Machine Learning for Cyber Physical Systems, which was held in Berlin, March 12-13, 2020. Cyber Physical Systems are characterized by their ability to adapt and to learn: They analyze their environment and, based on observations, they learn patterns, correlations and predictive models. Typical applications are condition monitoring, predictive maintenance, image processing and diagnosis. Machine Learning is the key technology for these developments. The Editors Prof. Dr.-Ing. Jürgen Beyerer is Professor at the Department for Interactive Real-Time Systems at the Karlsruhe Institute of Technology. In addition he manages the Fraunhofer Institute of Optronics, System Technologies and Image Exploitation IOSB. Dr. Alexander Maier is head of group Machine Learning at Fraunhofer IOSB-INA. His focus is on the development of algorithms for big data applications in Cyber-Physical Systems (diagnostics, optimization, predictive maintenance) and the transfer of research results to industry. Prof. Oliver Niggemann got his doctorate in 2001 at the University of Paderborn with the topic "Visual Data Mining of Graph-Based Data". He then worked for almost 8 years in leading positions in the industry. From 2008-2019 he held a professorship at the Institute for Industrial Information Technologies (inIT) in Lemgo/Germany. Until 2019 Prof. Niggemann was also deputy head of the Fraunhofer IOSB-INA, which works in industrial automation. On April 1, 2019 Prof. Niggemann took over the university professorship "Computer Science in Mechanical Engineering" at the Helmut-Schmidt-University in Hamburg / Germany. There he does research at the Institute for Automation Technology IfA in the field of artificial intelligence and machine learning for cyber-physical systems.