Title	Authors	Publication Year	Place of discovery	Country	Region	Publication type	Medium	Personnel	IT Infrastructure	AI awareness
A Cyber-Physical Production System Framework of Smart CNC Machining Monitoring System	Zhu, Kunpeng; Zhang, Yu	2018		China	Asia	Journal	IEEE/ASME Transactions on Mechatronics	0	0,5	0
A fog computing-based framework for process monitoring and prognosis in cyber-manufacturing	Wu, Dazhong; Liu, Shaopeng; Zhang, Li; Terpenny, Janis; Gao, Robert X.; Kurfess, Thomas; Guzzo, Judith A.	2017	Search term	USA	North America	Journal	Journal of Manufacturing Systems	0	1	0
A framework to guide the selection and configuration of machine-learning-based data analytics solutions in manufacturing	Zacarias, Alejandro Gabriel Villanueva; Reimann, Peter; Mitschang, Bernhard	2018	Search term	Germany	Europe	Conference	Procedia CIRP	1	0,5	1
A Generic Data Analytics System for Manufacturing Production	Hao Zhang, Hongzhi Wang, Jianzhong Li, and Hong Gao	2018	Snow ball search	China	Asia	Journal	Big Data Mining and Analytics	0,5	0	0,5
A Hybrid Machine Learning Approach for Predictive Maintenance in Smart Factories of the Future	Cho, Sangje; May, Gokan; Tourkogiorgis, Ioannis; Perez, Roberto; Lazaro, Oscar; de la Maza, Borja; Kiritsis, Dimitris	2018	Search term	Switzerland	Europe	Conference	IFIP Advances in Information and Communication Technology	0	0,5	0,5
A methodology for the semi-automatic generation of analytical models in manufacturing	David Lechevalier, Anantha Narayananb, Sudarsan Rachuric, Sebti Foufoud	2017	Snow ball search	France, USA, United Arab Emirates	Europe	Journal	Computers in Industry	0,5	0	0,5
A Predictive Maintenance System Design and Implementation for Intelligent Manufacturing	Cinar, Eyup; Kalay, Sena; Saricicek, Inci	2022	Search term	Turkey	Asia	Journal	Machines	0	0,5	0,5
A systematic development method for cyber-physical machine tools	Liu, Chao; Vengayil, Hrishikesh; Zhong, Ray Y.; Xu, Xun	2018	Search term	New Zealand	Australia	Journal	Journal of Manufacturing Systems	0,5	1	0,5
An intelligent decision support system for production planning based on machine learning	Gonzalez Rodriguez, German; Gonzalez-Cava, Jose M.; Mendez Perez, Juan Albino	2020	Search term	Spain	Europe	Journal	Journal of Intelligent Manufacturing	0,5	0	0,5
An Intelligent Maintenance Planning Framework Prototype for Production Systems	Kranzer, Simon; Prill, Dorian; Aghajanpour, Davood; Merz, Robert; Strasser, Rafaela; Mayr, Reinhard; Zoerrer, Helmut; Plasch, Matthias; Steringer, Robert	2017	Search term	Austria	Europe	Conference	IEEE International Conference on Industrial Technology	1	0,5	1

Architecture Model for a Holistic and Interoperable Digital Energy Management Platform	Senna, Pedro P.; Almeida, Antonio H.; Barros, Ana C.; Bessa, Ricardo J.; Azevedo, Americo L.	2020	Search term	Portugal	Europe	Conference	International Conference on Flexible Automation and Intelligent Manufacturing	1	0	0,5
CAAI—a cognitive architecture to introduce artificial intelligence in cyber-physical production systems	Andreas Fischbach · Jan Strohschein · Andreas Bunte · Jörg Stork · Heide Faeskorn-Woyke · NataliaMoriz · Thomas Bartz-Beielstein	2020	Snow ball search	Germany	Europe	Journal	The International Journal of Advanced Manufacturing Technology	0	0	1
Cloud-based big data analytics platform using algorithm templates for the manufacturing industry	Chanmo Jun, Ju Yeon Lee & Bo Hyun Kim	2018	Snow ball search	South Korea	Asia	Journal	International Journal of Computer Integrated Manufacturing	0,5	0,5	0,5
Cognitive analytics platform with AI solutions for anomaly detection	Vaia Rousopoulou, Thanasis Vafeiadis∗, Alexandros Nizamis, Ioannis Iakovidis	2022	Snow ball search	Greece	Europe	Journal	Computers in Industry	0,5	1	0,5
Computer Vision Toolkit for Non-invasive Monitoring of Factory Floor Artifacts	Deshpande, Aditya M.; Telikicherla, Anil Kumar; Jakkali, Vinay; Wickelhaus, David A.; Kumar, Manish; Anand, Sam	2020	Search term	USA	North America	Conference	Procedia Manufacturing	0	1	1
Data analysis and visualization framework in the manufacturing decision support system of COMPOSITION project	Vafeiadis, T.; Kalatzis, D.; Nizamis, A.; Ioannidis, D.; Apostolou, K.; Metaxa, I. N.; Charisi, V.; Beecks, C.; Insolvibile, G.; Pardi, M.; Vergori, P.; Tzovaras, D.	2019	Search term	Greece	Europe	Conference	Procedia Manufacturing	0	0	0
Developing a big data analytics platform for manufacturing systems: architecture, method, and implementation	Jungyub Woo ,Seung-Jun Shin, Wonchul Seo, Prita Meilanitasari	2018	Snow ball search	USA, South Korea	North America	Journal	The International Journal of Advanced Manufacturing Technology	0,5	1	0,5
Expert System for the Machine Learning Pipeline in Manufacturing	M. Frye, J. Krauß, R. H. Schmitt	2021	Snow ball search	Germany	Europe	Conference	IFAC-PapersOnLine	0,5	0,5	0

Integrating human cognition in cyber-physical systems: A multidimensional fuzzy pattern model with application to thermal spraying	Bocklisch, Franziska; Paczkowski, Gerd; Zimmermann, Stephan; Lampke, Thomas	2022	Search term	Germany	Europe	Journal	Journal of Manufacturing Systems	1	0	0,5
KOI: An Architecture and Framework for Industrial and Academic Machine Learning Applications	Johannes Richter, Johannes Nau, Michael Kirchhoff	2021	Snow ball search	Germany	Europe	Conference	International Conference on Modelling and Development of Intelligent Systems	0,5	0,5	0
ML Pro: digital assistance system for interactive machine learning in production	Neunzig, Christian; Moellensiep, Dennis; Kuhlenkoetter, Bernd; Moeller, Matthias	2023	Search term	Germany	Europe	Journal	Journal of Intelligent Manufacturing	1	0,5	1
MOMIS Dashboard: A Powerful Data Analytics Tool for Industry 4.0	Magnotta, Luca; Gagliardelli, Luca; Simonini, Giovanni; Orsini, Mirko; Bergamaschi, Sonia	2018	Search term	Italy	Europe	Book Chapter	Transdisciplinary Engineering Methods for Social Innovation of Industry 4.0	0	0,5	0,5
Patented intelligence: Cloning human decision models for Industry 4.0	Terziyan, Vagan; Gryshko, Svitlana; Golovianko, Mania	2018	Search term	Finland	Europe	Journal	Journal of Manufacturing Systems	0,5	0,5	0,5
Scalable Data Analytics from Predevelopment to Large Scale Manufacturing	Heimes, Heiner; Kampker, Achim; Buhrer, Ulrich; Steinberger, Anita; Eirich, Joscha; Krotil, Stefan	2019	Search term	Germany	Europe	Conference	Asia Pacific Conference on Research in Industrial and Systems Engineering	0	1	0
Supporting Data Analytics in Manufacturing with a Digital Assistant	Wellsandt, Stefan; Foosherian, Mina; Lepenioti, Katerina; Fikardos, Mattheos; Mentzas, Gregoris; Thoben, Klaus-Dieter	2022	Search term	Germany	Europe	Book Chapter	IFIP Advances in Information and Communication Technology	1	0	0,5
Towards a cognitive assistant supporting human operators in the Artificial Intelligence of Things	Angulo, Chacon et al.	2023	Snow ball search	Spain	Europe	Journal	Internet of Things	1	0,5	0,5
Towards a connected factory: Shop-floor data analytics in cyber-physical environments	Gyulai, David; Bergmann, Julia; Gallina, Viola; Gaal, Alexander	2019	Search term	Hungary	Europe	Conference	Procedia CIRP	0	0	0,5
Towards big industrial data mining through explainable automated machine learning	Garouani, Moncef; Ahmad, Adeel; Bouneffa, Mourad; Hamlich, Mohamed; Bourguin, Gregory; Lewandowski, Arnaud	2022	Snow ball search	France / Marocco	Africa	Journal	The International Journal of Advanced Manufacturing Technology	0,5	0,5	1

Validation of PERFoRM reference architecture demonstrating an application of data mining for predicting machine failure	Chakravorti, Nandini; Rahman, M. Mostafizur; Sidoumou, Mohamed Redha; Weinert, Nils; Gosewehr, Frederik; Wermann, Jeffrey	2018	Search term	Great Britain	Europe	Conference	Procedia CIRP	0	0,5	0,5

Upskilling	Collaborative Work	Data availability	Data quality	Data accessibility	Industrial validation	Target group validation	Use Case	Future research	Author Keywords
0	0	0,5	0	0,5	0	0	Wear and tear monitoring	extending the heterogeneous data scope such as process textual data and the 3D CAD models for deep learning and machining process optimization	Big data analytics condition monitoring cyber-physical production system (CPPS) machining process
0	0	0,5	0	1	0,5	0	Anomaly detection and predictive maintenance	build predictive models using machine learning algorithms and integrate these models into the online process monitoring system for diagnosis and prognosis	Fog computing Machine learning Industrial internet of things Prognosis Cyber-Manufacturing
0	1	0,5	1	0,5	0,5	0	Fault diagnostics	further extend and evaluate the generality of our framework by applying it to other kinds of use cases	data analytics machine learning learning algorithms generative design
0	0	0,5	1	0,5	0,5	0	Wear and tear monitoring	replace the R part in GMDA with RHadoop or SparkR to make it available for use with big data.	manufactory data analytics data mining optimization
0	0	0,5	0	0	0,5	0	Anomaly detection and predictive maintenance	Implemented and validated on not only the milling machine case but also other predictive maintenance pilots withintasks of BOOST 4.0, demonstrating its capacity and potential to support maintenance engineers and machine operators	Industry 4.0 Predictive maintenance Machine learning Big data Asset management Smart factories Sustainable manufacturing
0	0,5	0,5	1	0,5	0,5	0	Manufacturing monitoring, cost and power consumption	extend the manufacturing meta-model to enable the representation of problems in greater detail develop new model transformations to offer more capabilities to the model interpreters and improve the accuracy of the generated models include a scoring engine to TADAM develop a BN builder to enable probabilistic prediction	Advanced analytics Model-based Neural network Manufacturing Milling
0	0	0,5	0,5	0	0	0	Anomaly detection and predictive maintenance	Different use-cases and operational scenarios can be integrated to demonstrate the power advantage of the PdM system as a generic platform. Lastly, integration of the designed system across a factory floor for fleets of equipment monitoring is also planned.	automated machine learning (AutoML) cyber-physical systems (CPSs) data augmentation key performance indicators (KPIs) predictive maintenance (PdM)
0	0	0,5	0,5	1	0,5	0	Wear and tear monitoring	implementation of artificial intelligence in CPMT.Various data visualization and analytics algorithms will be embedded mobile applications for the developed CPMT pro-totype will be developed on different HMIs such as smart phonesand wearable devices OPC UA-based CPMTprototype is under development in our lab	Machine tools Machine tool 4.0 Cyber-physical systems Cyber twin MTConnect
0	0	0,5	0,5	0	1	1	Other/unclear	focused on the integration of this tactical-level decision tool with the low-level flow shop problem. The combination of both tools can be regarded as a first step for the development of a digital twin capable of simulating all the process involved in the manufacturing sector.	Artificial intelligence Intelligent manufacturing Machine learning Operation management Decision support system
0	0	0,5	0	0,5	0,5	0	Other/unclear	either the API needs to support stacked database layouts, or some of the machine learning preprocessing modules need to be moved to the local machine running the SCADA system	-

0,5	0	0	0	0	0,5	0	Manufacturing monitoring, cost and power consumption	focus on validating the proposed conceptual architecture model through an established multi-case research design, as well as on developing solutions based on such architecture to be implemented in manufacturing companies providing interoperability capabilities among enabling technologies and legacy systems that easily integrate with this reference architecture model	Energy efficiency; IIoT Platform; Architecture Model; Energy data driven services; Energy Digital Twin
0	0	0,5	0	0	0,5	0	Manufacturing monitoring, cost and power consumption	automatic feature extraction or explainable AI solve a different use case by the model further efforts are required to build a truly intelligent system that can solve harder use cases through learning over time and re-calibration in an online manner	CPPS Artificial intelligence Industry 4.0 Reference architecture Optimization SMBO Cognition Big data platform · Modularization · AutoML
0	0,5	0,5	0,5	0,5	0,5	0	Wear and tear monitoring	None	Manufacturing-specialised data analytics algorithm template cloud big data analytics platform Hadoop
0	0	0,5	1	0,5	1	0	Anomaly detection and predictive maintenance	comprise the addition of semantic technologies for the description of ML models and the application of reasoning functionalities over them An ontology will be built on top of it in order to enable rules appliance and reasoning related to various models metrics and parameters prescriptive analytics, as an effort to take advantage of the predictive future and to make decisions on any time horizon (immediate or long term), will be added a human-knowledge injection module will be added in order to enable human to add their observations and domain knowledge for further improvement of platform's analytic and predictive capabilities	Cognitive platform Predictive maintenance Failure prediction Decision making Advanced visualization techniques Industry 4.0
0	0	0,5	0	0,5	0,5	0	Machine Vision	future work also includes improving the current image processing routines for low light conditions integration of additional sensor technology such as acoustic, vibration, and high-speed controller data developed through the community Further additions of artificially intelligent modules using deep learning methods	Computer Vision Industrial Internet of Things IIoT Industry 4.0 Cyber-physical Systems Factory data analytics
0	0	0	0	0	0	0	Other/unclear	improvement of the algorithms used in prediction toolkits incorporation of new prediction models and rules These steps are going to be made with the continuous collaboration of the end users	Big data analytics deep learning simulation forecasting decision support
0	0	1	0,5	0	0,5	0	Manufacturing monitoring, cost and power consumption	implementation of optimization and disturbance handling, which directly relate to increasing productivity and sustainability performance on shop floors. The present work also excluded UQ integration, which should be accompanied with	Big data analytics Holonic manufacturing system Cyber-physical system Agent system Energy efficiency Predictive modeling
0	0,5	0,5	0,5	0	1	0	Wear and tear monitoring	automation of the whole ML-pipeline and introduction of ES for the other ML-pipeline phases	Machine Learning Artificial Intelligence Manufacturing Production Expert Systems Hyperparameter Optimization

0	0,5	0,5	0	0	0,5	1	Wear and tear monitoring	Drei Themen: Human Subsystem, Physical Subsystem, Cyber subsystem	Human-cyber-physical systems Human-machine teaming Artificial intelligence Fuzzy pattern classification Thermal spraying
0	0,5	0	0	0	0	0	Manufacturing monitoring, cost and power consumption	evaluate the system’s performance and acceptance in different inspection and testing domains. New use-cases will emerge, and new requirements will drive the development of the system further. Additional features will broaden the scope of the system towards a more general usage and a wider audience	Machine learning Deep learning Software architecture Distributed learning Industrial Machine Learning Edge computing
0,5	0	0,5	0,5	0,5	0,5	0	Wear and tear monitoring	a formats, use cases; support users dur	Failure prognosis Predictive quality control Supervised learning Human–machine interaction Interactive machine learning
0	0	0,5	0	0,5	0,5	0	Manufacturing monitoring, cost and power consumption	None	Data Integration Data Analytics Big Data
0,5	0,5	0,5	0	0	1	1	Other/unclear	integration, intellectualization, interaction, infrastructure,and implementation	Industry 4.0 Pi-Mind Decision-making Cyber-physical system Cognitive models Collective intelligence Value system Preference Clone Patented intelligence Smart decision Ontology
0	0	0,5	1	1	1	0	Other/unclear	focus will lie on organizational decision making structures, team compositions as well as work models in order to ensure the capabilities of data analytics within large scale manufacturing.	Data Analytics Early Phase Data Mining Methods Manufacturing
0	0	0	0	0	0	0	Fault diagnostics	Industrial validation	Augmented analytic Digital intelligent assistant Voice assistant Natural language understanding Assistance technology
1	0	0	0	0	0,5	1	Machine Vision	it will be relevant to define performance metrics that are quick and easy to measure, compared to changes in requirements, and that allow for quick and effective redesign adjustments in each of the components of the Human–AI system	Cognitive skills Artificial intelligence Internet of things Assistive systems Human-centred Cyber–physical systems
0	0	0	0	0	0,5	0	Manufacturing monitoring, cost and power consumption	future work within this research aims at increasing the technology readiness level of the implemented architecture, and also its scalability to reduce latency and achieve faster response times from the analytics models.	Data analytics Internet of Things Cyber-Physical Systems Production management
0,5	0	0,5	1	0	0,5	0	Anomaly detection and predictive maintenance	expand AMLBID to support algorithms of regression, deep learning and distributed ML libraries	Machine learning AutoML Explainable AI Data analysis Decision-support systems Industry 4.0

0	0	0,5	0	0,5	0,5	0	Anomaly detection and predictive maintenance	The PERFoRM framework (including the Data Analytics tool) will be migrated to the actual factory	Industrie 4.0 Predictive Maintenance Data Mining Machine Learning Condition Monitoring Equipment health