

1. Record Nr.	UNISA996417440703316
Titolo	Aircraft Alert
Pubbl/distr/stampa	Inside Washington Publishers United States
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Periodico
2. Record Nr.	UNISA996495171403316
Autore	Bar Schirin
Titolo	Generic multi-agent reinforcement learning approach for flexible job-shop scheduling // Schirin Bar
Pubbl/distr/stampa	Wiesbaden : , : Springer Vieweg, , [2022] ©2022
ISBN	9783658391799 9783658391782
Descrizione fisica	1 online resource (163 pages)
Disciplina	670.285
Soggetti	Flexible manufacturing systems Reinforcement learning Aprenentatge per reforç (Intel·ligència artificial) Sistemes multiagent Sistemes de producció flexibles Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Danksagung -- Abstract -- Zusammenfassung -- Contents -- Abbreviations -- List of Figures -- List of Tables -- 1 Introduction -- 1.1 Research Goals -- 1.2 Methodology -- 1.3 Structure of the Thesis -- 2 Requirements for Production Scheduling in Flexible Manufacturing

-- 2.1 Foundations of Flexible Job-Shop Scheduling Problems -- 2.2 Requirement Analysis of Flexible Scheduling Solutions -- 2.2.1 Influences on Warehouse Control Systems -- 2.2.2 Influences on Manufacturing Control Systems -- 2.2.3 Derived and Ranked Requirements -- 2.3 State of the Art: Approaches to Solve Job-Shop Scheduling Problems -- 2.3.1 Conventional Scheduling Solutions -- 2.3.2 Reinforcement Learning Scheduling Solutions -- 2.4 Identification of the Research Gap -- 2.5 Contribution of this Work: Extended Flexible Job-Shop Scheduling Problem -- 3 Reinforcement Learning as an Approach for Flexible Scheduling -- 3.1 Understanding the Foundations: Formalization as a Markov Decision Process -- 3.1.1 Agent-Environment Interaction -- 3.1.2 Policies and Value Functions -- 3.1.3 Challenges Arising in Reinforcement Learning -- 3.2 Deep Q-Learning -- 3.2.1 Temporal Difference Learning and Q-Learning -- 3.2.2 Deep Q-Network -- 3.2.3 Loss Optimization -- 3.3 State of the Art: Cooperating Agents to Solve Complex Problems -- 3.3.1 Multi-Agent Learning Methods -- 3.3.2 Learning in Cooperative Multi-Agent RL Setups -- 3.4 Summary -- 4 Concept for Multi-Resources Flexible Job-Shop Scheduling -- 4.1 Concept for Agent-based Scheduling in FMS -- 4.1.1 Overall Concept -- 4.1.2 Job Specification -- 4.1.3 Petri Net Simulation -- 4.2 Formalization as a Markov Decision Process -- 4.2.1 Action Designs -- 4.2.2 State Designs -- 4.2.3 Reward Design -- 4.3 Considered Flexible Manufacturing System -- 4.4 Evaluation of the Technical Functionalities -- 4.5 Summary.

5 Multi-Agent Approach for Reactive Scheduling in Flexible Manufacturing -- 5.1 Training Set-up -- 5.2 Specification of the Reward Design -- 5.3 Evaluation of Suitable Training Strategies -- 5.3.1 Evaluation of MARL Algorithms -- 5.3.2 Selection of MARL Learning Methods -- 5.3.3 Evaluation of Parameter Sharing and Centralized Learning -- 5.4 Training Approach to Present Situations -- 5.5 Summary -- 6 Empirical Evaluation of the Requirements -- 6.1 Generalization to Various Products and Machines -- 6.2 Achieving the Global Objective -- 6.2.1 Comparison of Dense and Sparse Global Rewards -- 6.2.2 Cooperative Behavior -- 6.3 Benchmarking against Heuristic Search Algorithms -- 6.3.1 Evaluation for Unknown and Known Situations -- 6.3.2 Evaluation of Real-time Decision-Making -- 6.4 Consolidated Requirements Evaluation -- 6.5 Summary -- 7 Integration into a Flexible Manufacturing System -- 7.1 Acceptance Criteria for the Integration Concept -- 7.2 Integration Concept of MARL Scheduling Solution -- 7.2.1 Integration in the MES -- 7.2.2 Information Exchange -- 7.3 Design Cycle -- 7.3.1 Functioning Scheduling -- 7.3.2 Efficient Production Flow -- 7.3.3 Handling of Unforeseen Events -- 7.3.4 Handling of New Machine Skills -- 7.3.5 Handling of New Machines -- 7.4 Summary -- 8 Critical Discussion and Outlook -- 9 Summary -- 1 Bibliography.

---