Cooperative Multi-Agent Joint Action Learning Algorithm (CMJAL) for Decision Making in Retail Shop Application ⊗

Deepak Annasaheb Vidhate (College of Engineering, Pune, India)

Cite Article ⌄   Favorite ★   Full-Issue Download ⬇

View Full Text HTML >

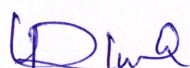(/gateway/article/full-text-html/201442)

View Full Text PDF >

(/gateway/article/full-text-pdf/201442)

Abstract

This article gives a novel approach to cooperative decision-making algorithms by Joint Action learning for the retail shop application. Accordingly, this approach presents three retailer stores in the retail marketplace. Retailers can help to each other and can obtain profit from cooperation knowledge through learning their own strategies that just stand for their aims and benefit. The vendors are the knowledgeable agents to employ cooperative learning to train in the circumstances. Assuming a significant hypothesis on the vendor's stock policy, restock period, and arrival process of the consumers, the approach was formed as a Markov model. The proposed algorithms learn dynamic consumer performance. Moreover, the article illustrates the results of cooperative reinforcement learning algorithms by joint action learning of three shop agents for the period of one-year sale duration. Two approaches have been compared in the article, i.e. multi-agent Q Learning and joint action learning.

Request access from your librarian to read this article's full text.

PRINCIPAL
Dr. Vithalrao Vikhe Patil
College of Engineering
Ahmednagar

Follow Reference   Araabi B. N. Mastoureshgh S. Ahmadabadi M. N. (2007). A study on expertise of agents and its effects on cooperative Q-learning.IEEE Transactions on Systems, Man, and Cybernetics. Part B, Cybernetics, 37(2), 398–409. 10.1109/TSMCB.2006.88326417416167

Follow Reference   Choi Y. C. Ahn H. S. (2010). A survey on multi-agent reinforcement learning: Coordination problems. In Proceedings of 2010 IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications, MESA 2010 (pp. 81–86). 10.1109/MESA.2010.5552089

Claus, C., & Boutilier, C. (1998). The Dynamics of Reinforcement Learning in Cooperative Multiagent Systems. *AAAI/IAAI*, (746), 752.

Gao, L.-M., Zeng, J., Wu, J., & Li, M. (2009). Cooperative reinforcement learning algorithm to distributed power system based on Multi-Agent. In *Proceedings of the 3rd International Conference on Power Electronics Systems and Applications PESA '09.*

Follow Reference   Gosavi A. (2003). Simulation-Based Optimization: Parametric Optimization Techniques and Reinforcement Learning. 10.1007/978-1-4757-3766-0

Guestrin, C., Lagoudakis, M., & Parr, R. (2002). Coordinated reinforcement learning. In *ICML* (Vol. 2, pp. 227–234).

Jiang, J. & Kamel, M. S. (2006). Aggregation of Reinforcement Learning Algorithms. In *Proceedings of theInternational Joint Conference on Neural Networks*, Vancouver, Canada.

Follow Reference   Kok, J. R., & Vlassis, N. (2004). Sparse cooperative Q-learning. In *Proceedings of the Twenty-first international conference on Machine learning - ICML '04* (p. 61). 10.1145/1015330.1015410

Follow Reference   Partalas I. Feneris I. Vlahavas I. (2007). Multi-Agent Reinforcement Learning using Strategies and Voting. In *Proceedings of the*Annual Machine Learning Conference of Netherlands (pp. 65–71). 10.1109/ICTAI.2007.15

Follow Reference   Raju Chinthalapati V. L. Yadati N. Karumanchi R. (2006). Learning dynamic prices in multiseller electronic retail markets with price sensitive customers, stochastic demands, and inventory replenishments.IEEE Transactions on Systems, Man and Cybernetics. Part C, Applications and Reviews, 36(1), 92–106. 10.1109/TSMCC.2005.860578

Tan, M. (1993). Multi-Agent Reinforcement Learning: Independent vs. Cooperative Agents. In *Machine Learning Proceedings 1993* (pp. 330–337).

Follow Reference   Verikas A. Lipnickas A. Malmqvist K. Bacauskiene M. Gelzinis A. (1999). Soft combination of neural classifiers: A comparative study.Pattern Recognition Letters, 20(4), 429–444. 10.1016/S0167-8655(99)00012-4

Follow Reference   Vlassis N. Kok J. R. (2006). Collaborative multi-agent reinforcement learning by payoff propagation.Journal of Machine Learning Research, 7, 1789–1828.

Follow Reference   Vidhate D. A. Kulkarni P. (2012). Cooperative machine learning with information fusion for dynamic decision making in diagnostic applications. In Proceedings of the 2012 International Conference on Advances in Mobile Networks, Communication and Its Applications, MNCApps 2012 (pp. 70–74). 10.1109/MNCApps.2012.19

Vidhate D. A. Kulkarni P. (2014a). A Novel Approach to Association Rule Mining Using Multilevel Relationship Algorithm for Cooperative Learning. In Proceedings of Fourth International Conference on Advanced Computing & Communication Technologies (pp. 230–236).

Follow Reference   Vidhate D. A. Kulkarni P. (2014b). Design of Multiagent System Architecture based on Association Mining for Cooperative Reinforcement Learning.Spvryan's International Journal of Engineering Sciences & Technology, 1(1), 6.

Vidhate, D. A., & Kulkarni, P. (2014c). Multilevel Relationship Algorithm for Association Rule Mining used for Cooperative Learning. *International Journal of Computer Applications, 86*(4), 20–27.

Follow Reference   Vidhate D. A. Kulkarni P. (2014d). To improve association rule mining using new technique: Multilevel relationship algorithm towards cooperative learning. In *Proceedings of the*International Conference on Circuits, Systems, Communication and Information Technology Applications, CSCITA 2014 (pp. 241–246). IEEE.10.1109/CSCITA.2014.6839266

Follow Reference   Vidhate D. A. Kulkarni P. (2016). A Step toward Decision making in Diagnostic Applications using Single Agent Learning Algorithms.International Journal of Computer Science and Information Technologies, 7(3), 1337–1342.

Follow Reference   Vidhate, D. A., & Kulkarni, P. (2016). Enhancement in Decision Making with Improved Performance by Multiagent Learning Algorithms. IOSR Journals, 1(18), 18–25.

Follow Reference   Vidhate D. A. Kulkarni P. (2016). Implementation of Multiagent Learning Algorithms for Improved Decision Making.International Journal of Computer Trends and Technology, 35(2), 60–66. 10.14445/22312803/IJCTT-V35P111

Follow Reference   Vidhate D. A. Kulkarni P. (2016). Innovative approach towards Cooperation Models for Multi-Agent Reinforcement Learning (CMMARL).Communications in Computer and Information Science, 628, 468–478. 10.1007/978-981-10-3433-6_56

Follow Reference   Vidhate D. A. Kulkarni P. (2016). New Approach for Advanced Cooperative Learning Algorithms using RL Methods (ACLA). In *Proceedings of the*ACM International Conference Proceeding Series (pp. 12–20). ACM.10.1145/2983402.2983411

Vidhate D. A. Kulkarni P. (2017). Enhanced Cooperative Multi-agent Learning Algorithms (ECMLA) using Reinforcement Learning. In *Proceedings of the*International Conference on Computing, Analytics and Security Trends, CAST 2016 (pp. 556–561). IEEE.
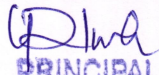
Follow Reference   Vidhate D. A. Kulkarni P. (2017). *Expertise based cooperative reinforcement learning methods (ECRLM) for dynamic decision making in retail shop application. In* Smart Innovation, Systems and Technologies (Vol. 84). Cham: Springer.

Vidhate D. A. Kulkarni P. (2017). Performance enhancement of cooperative learning algorithms by improved decision making for context based application. In *Proceedings of the*International Conference on Automatic Control and Dynamic Optimization Techniques, ICACDOT 2016 (pp. 59–63). ACM.

Request Access

PRINCIPAL
Dr. Vithalrao Vikhe Patil
College of Engineering
Ahmednagar

Research Tools

Database Search (/gateway/) | Help (/gateway/help/) | User Guide (/gateway/user-guide/) | Advisory Board (/gateway/advisory-board/)

User Resources

Librarians (/gateway/librarians/) | Researchers (/gateway/researchers/) | Authors (/gateway/authors/)

Librarian Tools

COUNTER Reports (/gateway/librarian-tools/counter-reports/) | Persistent URLs (/gateway/librarian-tools/persistent-urls/) | MARC Records (/gateway/librarian-tools/marc-records/) | Institution Holdings (/gateway/librarian-tools/institution-holdings/) | Institution Settings (/gateway/librarian-tools/institution-settings/)

Librarian Resources

Training (/gateway/librarian-corner/training/) | Title Lists (/gateway/librarian-corner/title-lists/) | Licensing and Consortium Information (/gateway/librarian-corner/licensing-and-consortium-information/) | Promotions (/gateway/librarian-corner/promotions/) | Online Symposium Series (/gateway/librarian-corner/online-symposium-series/)
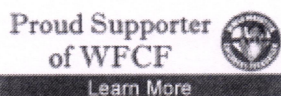
Policies

Terms and Conditions (/gateway/terms-and-conditions/)

(http://www.facebook.com/pages/IGI-

Global/138206739534176?ref=sgm)

(http://twitter.com/igiglobal)
(https://www.linkedin.com/company/igiglobal)

Proud Supporter
of WFCF
Learn More
(http://www.world-forgotten-
children.org)

PRINCIPAL
Dr. Vithalrao Vikhe Patil
College of Engineering
Ahmednagar