

Documents

Chiroma, H.^a, Gital, A.Y.^b, Rana, N.^c, Abdulhamid, S.'M.^d, Muhammad, A.N.^e, Umar, A.Y.^e, Abubakar, A.I.^f

Nature Inspired Meta-heuristic Algorithms for Deep Learning: Recent Progress and Novel Perspective
Intelligent Systems and Computing, 943, pp. 59-70.

DOI: 10.1007/978-3-030-17795-9_5

^a Department of Computer Science, Federal College of Education (Technical), Gombe, Nigeria

^b Department of Mathematical Sciences, Abubakar Tafawa Balewa University, Bauchi, Nigeria

^c College of Computer Science and Information Systems, Jazan University, Jazan, Saudi Arabia

^d Department of Cyber Security Science, Federal University of Technology, Minna, Nigeria

^e Department of Mathematics, Gombe State University, Gombe, Nigeria

^f Department of Computer Science, International Islamic University Malaysia, Gombak, Malaysia

Abstract

Deep learning is presently attracting extra ordinary attention from both the industry and the academia. The application of deep learning in computer vision has recently gain popularity. The optimization of deep learning models through nature inspired algorithms is a subject of debate in computer science. The application areas of the hybrid of nature inspired algorithms and deep learning architecture includes: machine vision and learning, image processing, data science, autonomous vehicles, medical image analysis, biometrics, etc. In this paper, we present recent progress on the application of nature inspired algorithms in deep learning. The survey pointed out recent development issues, strengths, weaknesses and prospects for future research. A new taxonomy is created based on nature inspired algorithms for deep learning. The trend of the publications in this domain is depicted; it shows the research area is growing but slowly. The deep learning architectures not exploit by the nature inspired algorithms for optimization are unveiled. We believed that the survey can facilitate synergy between the nature inspired algorithms and deep learning research communities. As such, massive attention can be expected in a near future. © 2020, Springer Nature Switzerland AG.

Author Keywords

Convolutional neural network; Cuckoo search algorithm; Deep belief network; Deep learning; Firefly algorithm; Nature inspired algorithms

Index Keywords

Autonomous vehicles, Computer vision, Data handling, Heuristic algorithms, Learning algorithms, Medical computing, Medical imaging, Network architecture, Neural networks, Optimization, Surveys; Convolutional neural network, Cuckoo search algorithms, Deep belief networks, Firefly algorithms, Nature inspired algorithms; Deep learning

Correspondence Address

Chiroma H.; Department of Computer Science, Federal College of Education (Technical)Nigeria; email: freedonchi@yahoo.com

Editors: Kapoor S., Arai K.

Publisher: Springer Verlag

Conference name: Computer Vision Conference, CVC 2019

Conference date: 25 April 2019 through 26 April 2019

Conference code: 225589

ISSN: 21945357

ISBN: 9783030177942

Language of Original Document: English

Abbreviated Source Title: Adv. Intell. Sys. Comput.

2-s2.0-85065478343

Document Type: Conference Paper

Publication Stage: Final

Source: Scopus

ELSEVIER

Copyright © 2019 Elsevier B.V. All rights reserved. Scopus® is a registered trademark of Elsevier B.V.

 **RELX** Group™