Vol. 21, No. 10, p. 1413-1534 / Oct., 2020

Front. Inform. Technol. Electron. Eng.

Administrated by
Chinese Academy of Engineering

Sponsored by
Chinese Academy of Engineering & Zhejiang University

Published by
Springer & Zhejiang University Press

Edited by
Editorial Office of *Journal of Zhejiang University-SCIENCE & FITEE*

Printed by
Hangzhou Shengyuan Printing Services Co., Ltd.

Publication Date
1st Week per Month

Price (Domestic)
160 CNY/Issue

ISSN 2095-9184
CN 33-1389/TP

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Perspective

Research Articles

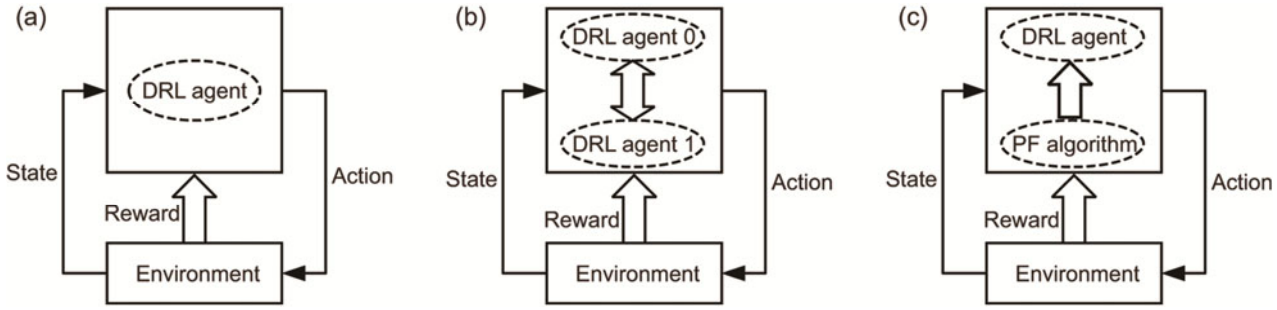
Highlights

Artificial intelligence + wireless communications

Artificial intelligence and wireless communications

Jun WANG, Rong LI, Jian WANG, et al. https://doi.org/10.1631/FITEE.1900527 (p.1413-1425)

The applications of artificial intelligence (AI) and machine learning technologies in wireless communications have drawn significant attention recently. AI has demonstrated real success in speech understanding, image identification, and natural language processing domains, thus exhibiting its great potential in solving problems that cannot be easily modeled. AI techniques have become an enabler in wireless communications to fulfill the increasing and diverse requirements across a large range of application scenarios.



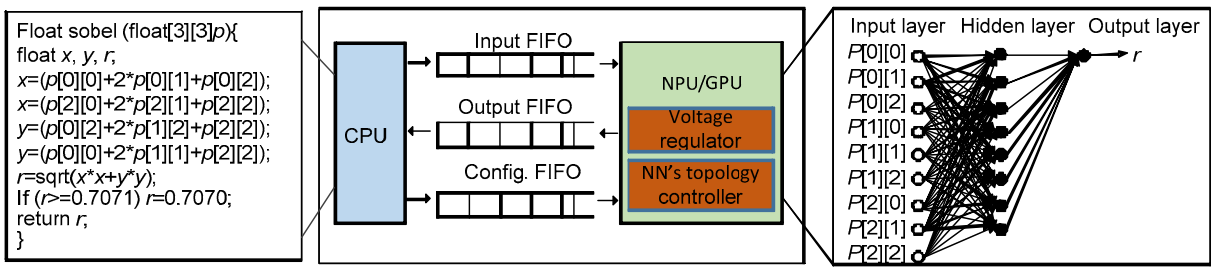
Learning methodologies: (a) direct learning; (b) dual learning; (c) expert learning

Approximate computing

Multi-dimensional optimization for approximate near-threshold computing

Jing WANG, Wei-wei LIANG, Yue-hua NIU, et al. https://doi.org/10.1631/FITEE.2000089 (p.1426-1441)

The demise of Dennard's scaling has created both power and utilization wall challenges for computer systems. As transistors operating in the near-threshold region are able to obtain flexible trade-offs between power and performance, it is regarded as an alternative solution to the scaling challenge. A reduction in supply voltage will nevertheless generate significant reliability challenges, while maintaining an error-free system that generates high costs in both performance and energy consumption. The main purpose of research on computer architecture has therefore shifted from performance improvement to complex multi-objective optimization.



An NN-NTC combined approximate approach