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IEEE Computational Intelligence Magazine
Special Issue on "Computational Intelligence for Mobile Network Optimization"

http://ihsanlab.itu.edu.pk/cfp-ieee-cim-mobile-net-optimization-feb-2018.html

Introduction/ Overview

Modern society has become increasingly reliant on mobile networks for their communication needs. Such networks are characterized by their dynamic, heterogeneous, complex, and data intensive nature, which makes them more amenable to automated *mobile network optimization* performed using ``computational intelligence'' (CI) techniques rather than manual optimization. CI techniques—which subsume multidisciplinary techniques from machine learning, optimization theory, game theory, control theory, and meta-heuristics—have a rich history in terms of being deployed in networking. Looking ahead, greater integration of CI into mobile networking architectures will likely be an essential component of the future of mobile networking, and will play a leading role in the upcoming 5th generation (5G) wireless mobile networks. From the perspective of mobile networking, CI techniques can be used to propose intelligent solutions that optimize problems such as scheduling and routing, traffic, capacity, coverage and power optimization for mobile networks. In particular, CI techniques will likely play an important role in future 5G wireless networks since the traditional *self-organizing network* (SON) techniques would not suffice for 5G, due to the stringent requirements of exceptionally high data rates and extremely low latency in the future 5G technology.

This special issue aims at illustrating the CI-enhanced network models, architectures, and protocols for mobile network optimization (MNO).

Main topics of interest (but not limited to):

CI-based techniques for MNO:

- Reinforcement learning for MNO
- Artificial neural networks for MNO
- Genetic algorithms for MNO
- Game theory for MNO
- Machine learning techniques for MNO
- Metaheuristic optimization tech. for MNO
- Self-organization maps for MNO
- Biological-inspired networking for MNO
- Fuzzy logic techniques for MNO
- Big data analytics for MNO

Technical issues related to building CI-based MNO solutions:

- Optimization of learning & convergence rates for MNO
- Real-time self-organization, self-configuration, self-optimization and self-recovery for MNO (in particular for 5G)
- Reliability, efficiency and routing issues in mobile network traffic optimization
- CI-based opportunistic spectrum access for MNO
- CI-based optimal network and computational resource allocation and sharing

Application of CI techniques for various MNO tasks:

- CI techniques for mobile heterogeneous networks (HetNets) optimization
- Dynamically optimize cell size & network traffic for better coverage and service using CI techniques
- Dynamically optimize multimedia traffic & transmission scheduling for better user experience using CI techniques
- Optimization of power consumption in mobile networks using CI techniques

Works in particular MNO configurations:

- Context-aware mobile cyber physical systems (CPS)
- Integration of CI in software defined mobile networks (SDMN)
- Integration of CI in mobile cloud networks
- Integration of CI in 4G/ 5G networks

Important Dates:

Manuscript Submission: **March 6, 2017**
Notification of Review Results: **May 29, 2017**
Submission of Revised Manuscripts: **August 15, 2017**
Submission of Final Manuscripts: **September 15, 2017**
Issue Publication: **February 2018**

Submission process:

Submission should be made via the Easychair website through the following link: https://easychair.org/conferences/?conf=ci4mno

The maximum length for the manuscript is 10 pages in double column, single-space format (including figures and references). The authors should specify in the first page of their manuscripts the contacts of the corresponding author and up to 5 keywords.

Guest Editors:

Junaid Qadir
Associate Professor
Information Technology University (ITU), Punjab, Pakistan
Email: junaid.qadir@itu.edu.pk

Amir Hussain
Professor
University of Stirling, United Kingdom
Email: ahu@cs.stir.ac.uk

Kok-Lim Alvin Yau
Associate Professor
Sunway University, Malaysia
Email: koklimy@sunway.edu.my

Muhammad Ali Imran
Professor
University of Glasgow, United Kingdom
Email: muhammad.imran@glasgow.ac.uk

Adam Wolisz
Professor
Technische Universität Berlin, Germany
Email: awo@ieee.org