Special Interest Group Request Form

SIG Name: Energy Harvesting Cognitive Radio Networks

Proposed Chair (name/affiliation/email):
Daniel Benevides da Costa
Department of Computer Engineering, Area: Telecommunications
Federal University of Ceará (UFC)
Sobral, CE, Brazil
danielbcosta@ieee.org

Proposed Vice-Chair(s) (name/affiliation/email):

Octavia Dobre
Faculty of Engineering and Applied Science
Memorial University, Canada
odobre@mun.ca

Trung Q. Duong
Queen's University Belfast, UK
trung.q.duong@qub.ac.uk

Minghua Xia
School of Electronics and Information Technology
Sun Yat-sen University, China
xiamingh@mail.sysu.edu.cn

Phee Lep Yeoh
School of Electrical and Information Engineering
University of Sydney, Australia
phee.yeoh@sydney.edu.au

External LinkedIn Group web address (or equivalent, if applicable): Under Construction

Scope and Objectives (please provide up to 200 words):

Energy-efficiency is one of the critical aspects for the successful design and deployment of the fifth generation (5G) and beyond wireless networks. The key idea is to support the efficient utilization of the available energy so as to significantly increase the network device lifetime (up to 10 years for low-power IoT devices) and drive down operational expenditure by several order of magnitude. Various types of wireless networks like wireless ad-hoc and sensor networks, device-to-device (D2D) communications, machine-type communications, and IoT, are energy-constrained since the network devices are powered by batteries. As such, to maintain network connectivity, the devices will need periodic replacement or recharging of batteries which would be expensive, inconvenient, and problematic in future ultra-dense networks. Furthermore, infrastructure-based wireless networks that are supplemented by a continuous power supply, e.g., cellular networks, require access to an electric power grid and thereby incurring high energy consumption that will further increase with

growing requirements of devices and data traffic. Hence, there is a great need to develop energy-efficient architectures and transmission techniques/protocols that extend the lifetime of networks and provide significant energy savings under the aegis of green radio communications. Recently, there has been significant interest in integrating energy harvesting (EH) technologies into cognitive radio networks (CRNs). In this SIG group, we aim to provide a platform to further investigate the development of EH CRNs, proposing new efficient protocols and techniques. We will capitalize on the complementary goals of energy- and spectral-efficiency enabled by EH CRNs to support high data rate, high availability and secure wireless communication networks.

Proposed activities for the first 24 months:

The SIG sponsors and promotes technical publications, workshops, tutorials, student activities, standardizations, and other related activities in the areas relevant to EH CRNs. Specifically, to obtain quality research and form this community, it is necessary to properly publicize the existence of the SIG. Owing to this fact, the proposed activities for the first 24 months are:

- Propose workshops and special sessions in flagship IEEE conferences, such as GLOBECOM 2018, ICC 2019, and GLOBECOM 2019. In particular:
    - 1st International Workshop on Energy Harvesting Cognitive Radio Networks – IEEE GLOBECOM 2018. Organizers: Daniel Benevides da Costa (Leader), Minghua Xia
    - 1st International Workshop on Main Trends in Energy Harvesting Cognitive Radio Networks – IEEE ICC 2019. Organizers: Minghua Xia (Leader), Daniel Benevides da Costa.
    - 2nd International Workshop on Energy Harvesting Cognitive Radio Networks – IEEE GLOBECOM 2019. Organizers: Daniel Benevides da Costa (Leader), Minghua Xia
- Propose Special Issues in IEEE Access and IEEE Transactions on Cognitive Communications and Networking. In particular:
    - 2nd Semester 2018 - Special Issue in IEEE Transactions on Cognitive Communications and Networking. Title: Energy Harvesting Cognitive Radio Networks. Guest Editor Team: Daniel Benevides da Costa (Leader), Octavia Dobre, Minghua Xia.
    - 2nd Semester 2019 - Special Issue in IEEE Access. Title: Energy Harvesting Cognitive Radio Networks. Guest Editor Team: Daniel Benevides da Costa (Leader), Trung. Q. Duong, Phee Lep Yeoh.
- Organize regular meeting during special sessions at related conferences.
- Promote invited talks in workshops, special sessions, and/or regular meetings from renowned researchers.

Senior Advisors:

Prof. Mohamed-Slim Alouini
Computer, Electrical and Mathematical Science and Engineering Division
King Abdullah University of Science and Technology (KAUST)
slim.alouini@kaust.edu.sa

Prof. George K. Karagiannidis
Department of Electrical & Computer Engineering

Aristotle University of Thessaloniki
geokarag@auth.gr

Prof. Arumugam Nallanathan
Queen Mary University of London, UK
arumugam.nallanathan@kcl.ac.uk

Founding Members (name/affiliation/email):

Prabhat K. Upadhyay
Indian Institute of Technology (IIT) Indore
pkupadhyay@iiti.ac.in

Georges Kaddoum
École de technologie supérieure (ETS), Canadá
georges.kaddoum@etsmtl.ca

Nan Yang
Australian National University
nan.yang@anu.edu.au

Jules Moualeu
University of the Witwatersrand, South Africa
jules.moualeu@wits.ac.za

Marco Di Renzo
Paris-Saclay University/CNRS, France
marco.di.renzo@gmail.com

Alexandros-Apostolos A. Boulogeorgos
Department of Electrical & Computer Engineering
Aristotle University of Thessaloniki
ampoulog@auth.gr

Haiyang Ding
XIdian University, China
dinghy2003@hotmail.com

Himal A. Suraweera
Department of Electrical and Electronic Engineering
University of Peradeniya
himal@ee.pdn.ac.lk

Ugo Silva Dias
University of Brasília, Brazil
ugodias@ieee.org

Zhiguo Ding
Lancaster University, UK
z.ding@lancaster.ac.uk

Petros Bithas
Department of Digital Systems
University of Piraeus, Greece
pbithas@gmail.com

Athanasios G. Kanatas
Department of Digital Systems
University of Piraeus, Greece
kanatas@unipi.gr

Mustapha Benjillali
INPT, Morocco
benjillali@ieee.org