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Special Issue Editors



Prof. Dr. Romano Fantacci

Website (<http://www.daconets.dinfo.unifi.it/vp-86-romano-fantacci.html>)

Guest Editor

Department of Information Engineering, University of Florence, Florence, Italy

Interests: resource allocation; internet of things; radio spectrum management; cellular radio; 5G mobile communication; access protocols; game theory; protocols; radio access networks; wireless channels; Zigbee; array signal processing; channel allocation; chaos; multicast communication; radiofrequency interference; telecommunication congestion control; telecommunication power management; telecommunication security; time series; wide-area networks; wireless sensors networks; big data; internet



Dr. Laura Pierucci

Website (<https://www.unifi.it/p-doc2-2017-200006-P-3f2a3d2c322d28-0.html>)

Guest Editor

Department of Information Engineering, University of Florence, Florence, Italy

Interests: 5G mobile communication; antenna arrays; MIMO techniques; device-to-device communications machine-to-machine communications; internet of things; access protocols; multicast communication; radiofrequency interference; channel allocation; relay networks; security; wireless sensor networks; cooperative communication; physical layer security; data protection; energy consumption; machine learning

Special Issue Information

Dear Colleagues,

Revolutionizing our lives, works, and manufacturing processes, the internet of things (IoT) will connect tens of billions of resource-limited mobiles, e.g., mobile devices, sensors, and wearable computing devices, to the Internet via cellular networks. The constrained battery and limited computation capacities of devices pose significant challenges for designing IoT. Moreover, the available spectrum resources are far from enough to support the new beyond 5G and IoT communication systems.

Resource allocation for traditional multiple-access communication systems has been widely studied, including TDMA, OFDMA, and code-division multiple access (CDMA), and it has already been designed for existing networks such as cognitive radio and heterogeneous networks. It is very challenging for current multiple-access techniques to support massive access over the limited radio spectrum.

A prominent strategy for improving spectral efficiency is non-orthogonal multiple access (NOMA), where each sub-channel is allowed to serve multiple terminals at the same time, and hence it has received considerable attention as a promising candidate for 5G and beyond.

In addition to this, the recent use of the software-defined networking (SDN) paradigm and the application of artificial intelligence methodologies have made significant improvements in performing energy-efficient resource allocation possible in different application scenarios.

This Special Issue seeks innovative works on a wide range of research topics, spanning both theoretical and systems research, including results from industry and academic/industrial collaborations, related but not restricted to the following topics:

- Energy efficiency using SDN technology
- Energy-efficient user association and beamforming for fog/edge
- Energy-efficient offloading techniques
- Radio access networks
- Energy-efficient resource allocation in NOMA
- Power transfer (SWIPT) non-orthogonal multiple access (NOMA)
- Energy-efficient maximization-oriented resource allocation in ultra-dense networks: Centralized and distributed algorithms
- Energy efficiency in massive MIMO
- Energy-efficient massive access for IoT
- Energy-efficient massive MTC (mMTC)
- Energy-efficient software-defined networking (SDN) and NFV for IoT
- Energy efficiency for social IoT networks

- Energy efficiency for IoT networks in smart manufacturing (industry 4.0)
- Energy efficiency using machine learning techniques
- Energy efficiency using games theory

Prof. Dr. Romano Fantacci
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 Guest Editors

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Sensors **2020**, *20*(22), 6475; <https://doi.org/10.3390/s20226475> (<https://doi.org/10.3390/s20226475>) - 12 Nov 2020

Abstract The forthcoming fifth-generation networks require improvements in cognitive radio intelligence, going towards more smart and aware radio systems. In the emerging radio intelligence approach, the empowerment of cognitive capabilities is performed through the adoption of machine learning techniques. This paper investigates the combined [...] [Read more.](#)

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Sensors 2020, 20(18), 5347; <https://doi.org/10.3390/s20185347> (<https://doi.org/10.3390/s20185347>) - 18 Sep 2020

Abstract The upcoming fifth generation (5G) wireless networks making use of higher-frequency spectrum bands suffer from serious propagation issues due to high path loss and beam directivity requirements. This promotes the device-to-device communications to boost the transmission reliability at the network edges, providing remarkable [...] [Read more.](#)

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[Energy Efficient Constellation for Wireless Connectivity of IoT Devices \(/1424-8220/20/14/3991\)](#)

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Sensors 2020, 20(14), 3991; <https://doi.org/10.3390/s20143991> (<https://doi.org/10.3390/s20143991>) - 17 Jul 2020

Abstract Reducing energy consumption is one of the most important task of the approaching Internet of Things (IoT) paradigm. Existing communication standards, such as 3G/4G, use complex protocols (active mode, sleep modes) in order to address the waste of energy. These protocols are forced [...] [Read more.](#)

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[A Hybrid Interweave–Underlay Countrywide Millimeter-Wave Spectrum Access and Reuse Technique for CR Indoor Small Cells in 5G/6G Era \(/1424-8220/20/14/3979\)](#)

by [Rony Kumer Saha](#) (<https://sciprofiles.com/profile/750406>)
Sensors 2020, 20(14), 3979; <https://doi.org/10.3390/s20143979> (<https://doi.org/10.3390/s20143979>) - 17 Jul 2020

Abstract In this paper, we propose a hybrid interweave–underlay spectrum access and reuse technique for the dynamic spectrum access and reuse of the countrywide 28 GHz millimeter-wave (mmWave) spectrum to in-building small cells of each mobile network operator (MNO) in a country. For the [...] [Read more.](#)

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Sensors 2020, 20(14), 3902; <https://doi.org/10.3390/s20143902> (https://doi.org/10.3390/s20143902) - 13 Jul 2020   



Abstract The Internet of Things (IoT) has been one of the main focus areas of the research community in recent years, the requirements of which help network administrators to design and ensure the functionalities and resources of each device. Generally, two types of devices—constrained [...] **Read more.**

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[GRAFT: A Model for Evaluating Actuator Systems in Terms of Force Production \(1424-8220/20/7/1894\)](#)

by  [Hamza Baniata \(https://sciprofiles.com/profile/953282\)](https://sciprofiles.com/profile/953282),  [Ahmad Sharieh \(https://sciprofiles.com/profile/954671\)](https://sciprofiles.com/profile/954671),  [Sami Mahmood \(https://sciprofiles.com/profile/1007647\)](https://sciprofiles.com/profile/1007647) and  [Attila Kertesz \(https://sciprofiles.com/profile/261206\)](https://sciprofiles.com/profile/261206)

Sensors 2020, 20(7), 1894; <https://doi.org/10.3390/s20071894> (https://doi.org/10.3390/s20071894) - 29 Mar 2020

Abstract In the scope of evaluation methodologies for Internet of Things (IoT) systems, some approaches concern security, while others latency. However, some methodologies evaluate systems that contain active entities, so-called actuators. In this paper, we propose a novel methodology for evaluating such systems with [...] **Read more.**

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[On Maximizing Energy and Spectral Efficiencies Using Small Cells in 5G and Beyond Networks \(1424-8220/20/6/1676\)](#)

by  [Rony Kumer Saha \(https://sciprofiles.com/profile/750406\)](https://sciprofiles.com/profile/750406)

Sensors 2020, 20(6), 1676; <https://doi.org/10.3390/s20061676> (https://doi.org/10.3390/s20061676) - 17 Mar 2020




Abstract Addressing high capacity at low power as a key design goal envisages achieving high spectral efficiency (SE) and energy efficiency (EE) for the next-generation mobile networks. Because most data are generated in indoor environments, an ultra-dense deployment of small cells (SCs), particularly within [...] **Read more.**

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A Resource Allocation Mechanism Based on Weighted Efficiency Interference-Aware for D2D Underlaid Communication ([1424-8220/19/14/3194](#))

by  [Jingzhao Li](https://sciprofiles.com/profile/author/Z21RR1pJYTRJVU9zcTJ6bm1INUxWSU1IWEJ5VEVLd0g3THJZUH7CM3EzOD0=) (<https://sciprofiles.com/profile/author/Z21RR1pJYTRJVU9zcTJ6bm1INUxWSU1IWEJ5VEVLd0g3THJZUH7CM3EzOD0=>),  [Xiaoming Zhang](https://sciprofiles.com/profile/author/S3dsRTIldHJiemJFT2dIVnRXUWpGOFdWU0pQRkc5SVVnUWtuRm9NbEEvOD0=) (<https://sciprofiles.com/profile/author/S3dsRTIldHJiemJFT2dIVnRXUWpGOFdWU0pQRkc5SVVnUWtuRm9NbEEvOD0=>),  [Yuan Feng](https://sciprofiles.com/profile/author/N2hjOC9FTTNRQVJwSmINTjZuWVcwZz09) (<https://sciprofiles.com/profile/author/N2hjOC9FTTNRQVJwSmINTjZuWVcwZz09>), and  [Kuan-Ching Li](https://sciprofiles.com/profile/574677) (<https://sciprofiles.com/profile/574677>).

Sensors **2019**, *19*(14), 3194; <https://doi.org/10.3390/s19143194> (<https://doi.org/10.3390/s19143194>) - 19 Jul 2019

Cited by 3 ([1424-8220/19/14/3194#citedby](#)).

Abstract Device-to-device (D2D) communication is a promising technique for direct communication to enhance the performance of cellular networks. In order to improve the system throughput and utilization of spectrum resource, a resource allocation mechanism for D2D underlaid communication is proposed in this paper where [...] [Read more](#).

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
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Review

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Magnetic and Electric Energy Harvesting Technologies in Power Grids: A Review ([1424-8220/20/5/1496](#))

by  [Feng Yang](https://sciprofiles.com/profile/981509) (<https://sciprofiles.com/profile/981509>),  [Lin Du](https://sciprofiles.com/profile/380421) (<https://sciprofiles.com/profile/380421>),  [Huizong Yu](https://sciprofiles.com/profile/author/SzFub2dJdnBWTIMxSDA5WJJSVWJ4VS8vR1pHVWpRNGg3RIIOQkpmQVZ4QT0=) (<https://sciprofiles.com/profile/author/SzFub2dJdnBWTIMxSDA5WJJSVWJ4VS8vR1pHVWpRNGg3RIIOQkpmQVZ4QT0=>) and  [Peilin Huang](https://sciprofiles.com/profile/author/V2pIY2xGUFRRRINHU1Z6ZUdxThxTVI1Y3ZDdmlxLy82emYyQkJXUmxmUT0=) (<https://sciprofiles.com/profile/author/V2pIY2xGUFRRRINHU1Z6ZUdxThxTVI1Y3ZDdmlxLy82emYyQkJXUmxmUT0=>)

Sensors **2020**, *20*(5), 1496; <https://doi.org/10.3390/s20051496> (<https://doi.org/10.3390/s20051496>) - 09 Mar 2020

Cited by 1 ([1424-8220/20/5/1496#citedby](#)).

Abstract With the development of intelligent modern power systems, real-time sensing and monitoring of system operating conditions have become one of the enabling technologies. Due to their flexibility, robustness and broad serviceable scope, wireless sensor networks have become a promising candidate for achieving the [...] [Read more](#).

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