ISSUE 5

PAINLESS

An innovative training network (ITN) on

Energy-autonomous portable access points for infrastructure-less networks

NEWSLETTER DATE
July 2020

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 812991

Painless targets a range of dissemination routes to promote self-powered networks and their paradigm-shifting applications towards coverage enriching and extension. Scientific Community: Awareness will be raised through a variety of methods especially conference, journal and magazine publications in well-esteemed venues and publishers.

Inside this issue

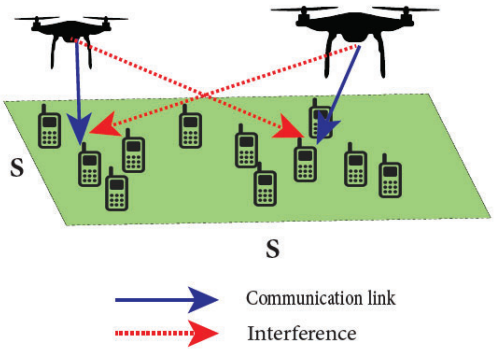
After a one-year journey, take a look at some of our ESRs' progress!

PAINLESS Research projects' Updates

Iman Valiulahi, UCL
ESR #1

I. Valiulahi, C. Masouros, "Multi-UAV Deployment for Throughput Maximization in the Presence of Co-Channel Interference", IEEE TIoT.

Over the past few years, there has been a growing interest in using UAVs for high-rate wireless communication systems due to their highly flexible deployment and maneuverability. The aim of this paper is to propose a 3D multi-UAV deployment approach to provide QoS requirements for different types of user distributions in the presence of co-channel interference by maximizing the minimum achievable system throughput for all of the ground users.



Muhammad Haroon Tariq, ALBA
ESR#2

M. Haroon, I. Chondroulis, P. Skartsilas, N. Babu, and C. B. Papadias., mm Wave Massive MIMO Channel Measurements for Fixed Wireless and Smart City Applications, PIMRC 2020.

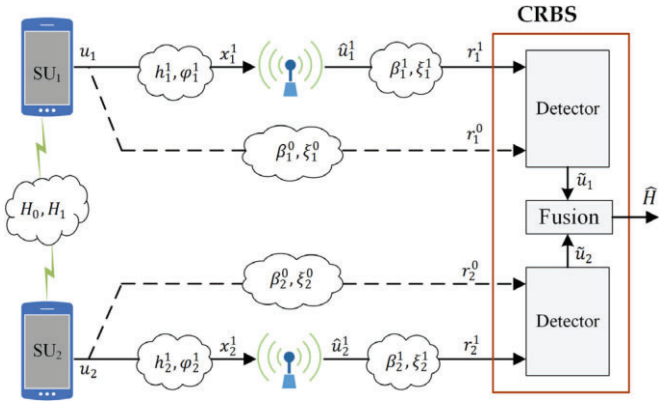
The use of Massive MIMO and Millimeter-wave (mmWave) networks can be beneficial for a number of Fixed Wireless Access use cases, such as Smart City (SC) Services, providing connectivity for SC infrastructure, and Fixed Wireless Access using street-level distribution and access via so-called "street furniture" equipment. In this paper, we present the findings from a mmWave channel measurement campaign performed in different indoor and outdoor scenarios as part of our contribution to the mmWave Network Project Group of the Telecom Infra Project see (https://telecominfraproject.com/mmwave/).

PAINLESS Research projects' Updates

Mohammad Al-Jarrah, UMAN
ESR#6

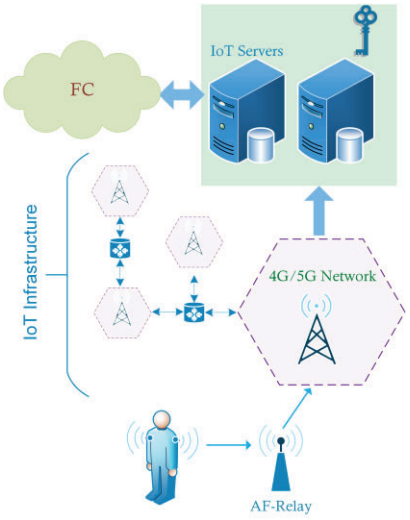
1. M. A. Al-Jarrah, A. Al-Dweik, S. S. Ikki, E. Alsusa, Spectrum-Occupancy Aware Cooperative Spectrum Sensing Using Adaptive Detection, IEEE Systems Journal, https://ieeexplore.ieee.org/abstract/document/8753528.

An efficient adaptive detection scheme is proposed for cognitive radio networks where multiple secondary users (SUs) cooperate to identify idle spectrum bands. Each SU generates a binary local decision, which is then transmitted either directly or via the assistance of intermediate relays to a cognitive radio base station (CRBS), where the global decision is made. The fusion process at the CRBS is performed using the local binary decisions made by the individual SUs.



2. M. A. Al-Jarrah, E. Alsusa, A. Al-Dweik, Decision Fusion for Power Constrained Wireless Body Sensor Networks with Amplify and Forward Relays, Workshop on IoT Enabling Technologies in Healthcare in ICC2020.

This paper considers deriving the optimal decision fusion rule for cooperative wireless body sensor networks (WBSNs). The undertaken network model considers multiple sensors deployed to sense a certain binary biological phenomenon, and amplify and forward (AF) relays are deployed to assist the sensors to transmit their binary decisions to a remotely located fusion center (FC).

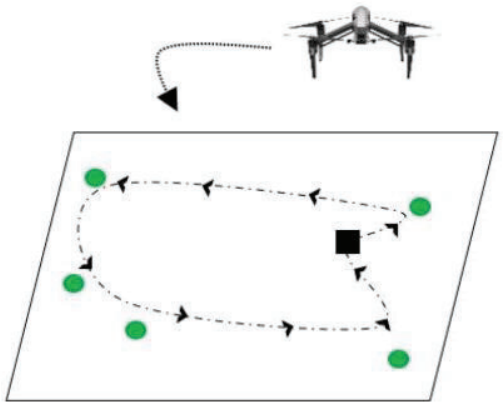


PAINLESS Research projects' Updates

Xiaoye Jing, UCL
ESR#9

X. Jing, C. Masouros, "UAV Trajectory Design and Bandwidth Allocation for Coverage Maximization with Energy and Time Constraints", PIMRC 2020.

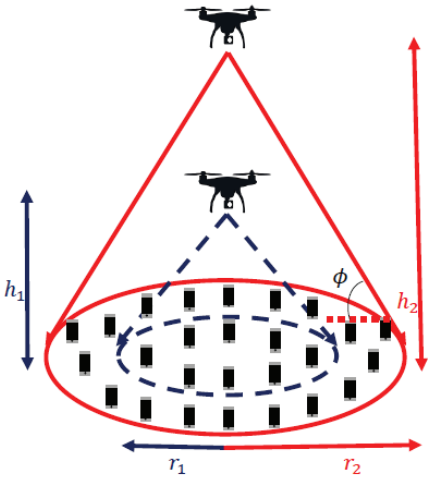
In this paper, we consider a scenario where a rotary-wing UAV is dispatched for covering a maximum number of ground users by jointly optimizing the UAV trajectory and bandwidth allocation, under constraints of predetermined total flight time and on-board energy. The problem is difficult to solve since has nonconvex constraints and includes infinite variables over time.



Nithin Babu, ALBA
ESR#10

N. Babu, K. ntougias, C. B. Papadias, P. Popovski, "Energy efficient altitude optimization of an aerial access point," in IEEE 31st PIMRC'20-Workshop on UAV Communications for 5G and Beyond (PIMRC'20 WS- UAV 5G & Beyond), 2020.

An energy efficient optimal altitude for an aerial access point is presented in this paper, which acts as a flying base station to serve a set of ground user equipment. Since the ratio of total energy consumed by the aerial vehicle to the communication energy is very large, the aerial vehicle's energy consumption is included in the problem formulation. The objective is translated into a non-convex optimization problem of maximizing the global energy efficiency of the aerial communication system subject to altitude and minimum individual data rate constraints.

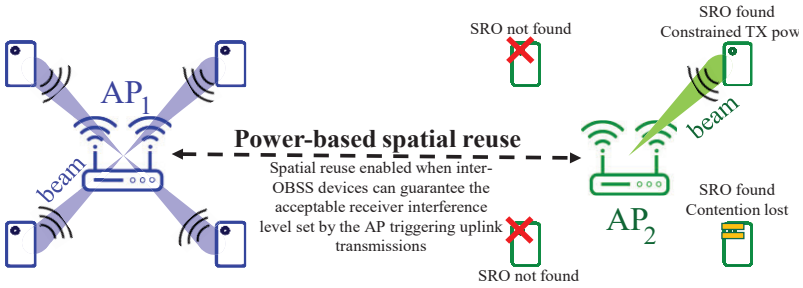


PAINLESS Research projects' Updates

Eloise De Carvalho Rodrigues, NOK
ESR#11

Eloise contributes to the following standardization:

A.Garcia-Rodriguez, D. Lopez-Perez, L. Galati Giordano, O. Alanen, M. Kasslin, E. de Carvalho Rodrigues, and E. Rantala, "Performance of parameterized spatial reuse (PSR) with coordinated beamforming/null steering for 802.11be," IEEE 802.11-20/0091r2, Jan. 2020.



Igor Donevski, AAU
ESR#15

I. Donevski, J. J. Nielsen, Dynamic Standalone Drone-Mounted Small Cells, EuCNC 2020.
This paper investigates the feasibility of Dynamic Horizontal Opportunistic Positioning (D-HOP) use in Drone Small Cells, with a central analysis on the impact of antenna equipment efficiency onto the optimal DSC altitude that has been chosen in favor of maximizing coverage. We extend the common urban propagation model of an isotropic antenna to account for a directional antenna, making it dependent on the antenna's ability to fit the ideal propagation pattern.