Evaluating the Total Human Electromagnetic Exposure in a UAV-aided Network

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Abstract— Society relies more than ever on the availability of the wireless networks but is at the same time also concerned about the potential health effects of the electromagnetic radiation caused by these networks. The government has enforced strict legislations to which mobile devices and base stations have to satisfy.

This research investigates the specific absorption rate caused by these electromagnetic waves by taking all mobile devices and base stations into account. To accomplish this goal, the deployment tool developed by the WAVES research group at Ghent University will be used. This tool simulates an entire network where transmission towers are represented by femtocell base stations attached to drones. This research also investigates how these drones can be guided in order to reach certain goals like minimizing power consumption or electromagnetic exposure.

It looks from the results that ... (todo)

Keywords—LTE, Electromagnetic Radiation, power consumption, drones, femtocell, microstrip patch antenna, radiation pattern, specific absorption rate (SAR)

I. Introduction

SOCIETY is constantly getting more and more dependent on wireless communication. On any given moment, in any given location, an electronic device can request to connect to the bigger network. Devices need more than ever to be connected. Also in exceptional and possibly life-threatening situations, the public relies on the cellular network. For example during the terrorist attacks at Brussels Airport, mobile network operators saw all telecommunications drastically increasing causing moments of contention. Some operators decided to temporarily exceed the exposure limits in order to handle all connections. Electromagnetic exposure can however not be neglected. Research shows how excessive electromagnetic radiation can cause diverse biological side effects [3]. This research tries to map the electromagnetic exposure of the average user. In order for this to work, an existing planning tool is used and the three prominent sources of radiation in a telecommunication network are investigated, being: the user's own phone, all base stations and all devices from other users in the network. The electromagnetic behaviour of the network will be analysed by applying the tool in different scenarios to give insight which variables influence the exposure and how the network can be optimized accordingly.

II. State of the Art

A. Gerelateerd werk

TODO

B. Scenario's

todo

C. Electromagnetische blootstelling

todo

III. Resultaten

todo

IV. Conclusie

todo

A. Referencies

todo

References

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