TOPSIS-BASED LTE-WIFI OFFLOADING WITH REALISTIC ATTRIBUTES

By

Ferial Mahmoud Rashad Hassan Hantera

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
in
ELECTRONICS AND COMMUNICATIONS ENGINEERING

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Title of Thesis:

TOPSIS-BASED LTE-WIFI OFFLOADING WITH REALISTIC ATTRIBUTES

Key Words:
LTE; WiFi; Vertical handover; TOPSIS; ANDSF

Summary:
This thesis proposes a vertical handover scheme for determining the best network selection for Long Term Evolution (LTE) network offloading. Our proposed algorithm accounts for realistic attributes such as users' mobility/velocity and users' battery life. These realistic attributes are proposed in addition to other existing ones such as networks' congestion level, maximum offered throughput, and received signal strength. Moreover, we propose a modified vertical handover algorithm which is based on Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) in addition to newly introduced techniques (Neighbor Validator and Handover Controller) for selecting the optimal target network. Afterward, we compare and assess our proposed scheme with others considered in the literature in terms of various realistic Key Performance Indicators (KPIs) including users' equipment power gain, session interruption, ping pong and un-useful handovers, in addition to other conventional metrics such as achievable throughput and total number of triggered handovers.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Date:

Signature:

Dedication

I will dedicate this work to Mona Selim and Mahmoud Hantera; my ever loving and caring Mother and Father. May Allah protect you always.

Acknowledgments

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