

تاريخ النشر	أسماء المشاركين	عناوين الأبحاث	م
خلال الفترة من 2007 الى 2012	كما هو موضح بقائمة الابحاث المرفقة.	تم نشر عدد 15 بحث (خمسة عشر ) بحث علمي خلال الفترة من 2007 – 2012 وهى كما موضحة بقائمة الابحاث المرفقة مع هذه الاستمارة. مرفق أيضا مع هذه الاستمارة اسطوانة مسجل عليها : قائمة الابحاث – الابحاث – ملخصات الابحاث	1

### List of Publications



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### Journal Publications:

1. Saied M. Abd El-atty and Z. M. Gharseldien, " ANALYTICAL MODEL FOR MOBILE USER CONNECTIVITY IN COEXISTING FEMTOCELL/MACROCELL NETWORKS,"

Accepted in IJWMN International Journal of Wireless and Mobile Networks, Academy & Industry Research Collaboration Center (AIRCC)., December 2012.

2. Saied M. Abd El-atty and K. Lizos,“ Improving Handover Performance in Wireless Mobile Networks”, IJCSI International Journal of Computer Science Issues, Vol. 9, Issue 5, No 3, September 2012, pp.55-60.
3. Saied M. Abd El-atty and K. Lizos,“Enhanced Uplink Scheduling for Continuous Connectivity in High Speed Packet Access Systems” ,IJCNS International Journal of Communications, Network and System Sciences, August 2012, 5, 446-453.
4. Saied M. Abd El-atty, Dimitrios N. Skoutas, Angelos N. Rouskas and George T. Karetos,“A Cross Layer Scheduling Framework for Supporting Bursty Data Applications in WCDMA Networks”, Wireless Personal Communications (WPC), Springer, 2008, vol. 46, no.1, pp. 33–45.
5. Dimitrios N. Skoutas, Saied M. Abd El-atty, and Angelos N. Rouskas,“ Guard Code Scheme for Handover traffic Management in WCDMA Systems”, International Journal of Wireless Information Networks (IJWIN), Springer, 2008, vol. 15, no.2, pp. 98–104.
6. Saied M. Abd El-atty, Dimitrios N. Skoutas, and Angelos N. Rouskas “Reducing CQI signaling overhead in HSPA” Journal Research Letters in Communications, 2008, Hindawi Publishing Corp. New York, NY, United States, Article ID 982805, 5 pages.

#### **International Conferences:**

1. Saied M. Abd El-atty and Z. M. Gharseldien, “Mobile User Connectivity Performance with Coexisting Femtocell Networks,” Accepted in the IEEE International Conference

on High-capacity Optical Network and Emerging Technology (HONET), 2012.Istanbul.

2. K. Lizos and Saied M. Abd El-atty, "A Novel Packet Scheduling for High Speed Bursty Traffic in LTE based-3G Concepts," Proc. 8th IEEE International Wireless Communications and Mobile Computing Conference (IWCMC), 2012, pp.671-676.
3. Saied M. Abd El-atty and K. Lizos, "Uplink Scheduling for Continuous Connectivity in High Speed Packet Access System," Proc. 8th IEEE International Conference on High-capacity Optical Network and Emerging Technology (HONET), 2011, pp.311-317.
4. Saied M. Abd El-atty, "Vehicular Communications Framework for Efficient Multihop Connectivity in AHVN," Proc. IEEE 74th Vehicular Technology Conference (VTC2011-Fall), 2011, pp.1-5.
5. Saied M. Abd El-atty and K. Lizos, "Efficient Connection Admission Control Based-Code Searching Algorithm in 3G/Mesh Networks," Proc. IEEE 6th GCC Conference and Exhibition, 2011, pp.9-12.
6. Saied M. Abd El-atty and Stamatiou G.K "Performance analysis of Multihop connectivity in VANET," Proc. IEEE 7th International Symposium on Wireless Communication Systems (ISWCS 2010), 2010, pp.335-339.
7. Saied M. Abd El-atty, "Enhanced Performance of Handover in 3G Mobile Networks," Proc. 27th IEEE National Radio Science Conference (NRSC 2010), 2010, pp.1-5
8. Saied M. Abd El-atty, Dimitrios N. Skoutas, Angelos N. Rouskas and George T. Karetos," Radio Resource Management for Handoff Provisioning in WCDMA Systems", Proc. 18th IEEE International Symposium on Personal Indoor and Mobile Radio Communications (PIMRC 2007), 2007, pp.1-5.
9. Saied M. Abd El-atty, Dimitrios N. Skoutas, and Angelos N. Rouskas," Handover Provisioning in WCDMA Systems",

Proc. 3rd International ICST Conference on Mobile Multimedia Communications (MOBIMEDIA 2007), August 2007, pp.1–5.

## **MOBILE USER CONNECTIVITY PERFORMANCE WITH COEXISTING FEMTOCELL NETWORKS**

Saied M. Abd El-atty and Z. M. Gharsseldien

### **Abstract:**

In Femto-Macro cellular networks, the femto user (FUE) can be connected to femto access point (FAP) with low communication range rather than higher communication range to macro base station (MBS). Furthermore, in such emerging networks, the spatial reuse of resources is permissible and the transmission range can be decreased, then the probability of connectivity is high. In this work, we propose an analytical model for mobile user connectivity probability in Femto-Macro cellular networks. On the other hand, we study the capability of femtocell networks to serve macro users (MUEs) at the boundary of macrocell i.e., no coverage or poor signal as well as to serve the users fully inside the femtocell i.e., reduce the communication load of macrocell. Numerical results demonstrate the efficiency of computing the connectivity probability in Femto-Macro cellular networks.

# A Novel Packet Scheduling for High Speed Bursty Traffic in LTE based-3G Concepts

K. Lizos and Saied M. Abd El-atty

## **Abstract**

Third Generation partnership project long term evolution (3GPP LTE) requires low complexity, efficient scheduling policies to sustain optimal system operation while maintaining high level Quality of Service (QoS) to each active traffic flow. In sequel, the fairness principle is crucial in the design of a robust scheduler, due to buffer status, spectrum allocation limitations, intra-cell interference restrictions and delay requirements. In this paper, we propose two novel schedulers for LTE 3G networks capable of supporting high speed bursty data, namely Delay Threshold Normalized Scheduler (DTNS) and Queue Packet Normalized Scheduler (QPNS). Both schedulers are founded, in a recursive manner, on the concept of traffic flow queue evaluation in terms of overall packet queue delay. In addition, the packet scheduling procedure is jointly designed to operate within a cross-layer framework incorporating variations of the LTE wireless channel. For comparison purposes, we show that the proposed schedulers outperform adopted, 3G schedulers on the average service delay and packet loss, while maintaining low per-slot in-processing complexity.

# UPLINK SCHEDULING FOR CONTINUOUS CONNECTIVITY IN HIGH SPEED PACKET ACCESS SYSTEM

Saied M. Abd El-atty and Konstantinos Lizos

## **Abstract**

The performance efficiency of high speed packet access (HSPA) systems is mainly based on channel quality information (CQI) reports transmitted by user equipment (UE) to Node B. CQI contains the required scheduling information (SI) that is used in the Node B scheduler. However, the frequent CQI reports increase uplink interference, reducing the signal reception quality at the uplink, causing degradation of the system spectral efficiency. In this paper, we propose an improved CQI prediction scheme based on a finite state Markov chain (FSMC) model for wireless channel, in order to reduce CQI signaling overhead in the HSPA system. Then, we introduce an enhanced uplink packet scheduling (EUPS) scheme to provide quality of services (QoS) guaranteed for continuous packet connectivity in the enhanced uplink (EUL). EUPS serves the active UEs not only according to buffer status but also according to reported state of the wireless channel of each UE. The performance of the proposed scheme in terms of average packet delay, average packet drop and average cell throughput is compared to the classical scheduler of 3GPP standards. The simulation results show the effectiveness of the proposed scheme.

# Vehicular Communications Framework for Efficient Multihop Connectivity in AHVN

Saied M. Abd El-atty

## **Abstract**

The advanced heterogeneous vehicular network (AHVN) is a new paradigm for future vehicular networks. AHVN is an integrated architecture between the VANET and the existing cellular wireless networks. This paper introduces a vehicular communications framework for efficient Multihop connectivity in AHVN. The vehicular communication in VANET is based on the failure probability of vehicular connectivity. However, the vehicular communications to cellular networks (V2I) depends on the access failure probability to radio channel in base station (or Node B). We proposed a Multihop vehicular connectivity model in VANET which depends on the optimal headway distance, false initiation connectivity and the received signal strength (RSS). Then we determine the failure probability of vehicular connectivity ( $P_f$ ) in Multihop VANET. Subsequently, we employ  $P_f$  as a handover criterion in order to establish a communication link with V2I when the VANET connectivity fails. Therefore, we propose an efficient multiple access scheme based-code reservation for resource management in AHVN, and then we can determine the failure access probability by employing a Markov chain model. The analysis of the proposed framework in terms of throughput, delay and access failure probability is driven. The numerical results demonstrate the effectiveness of the proposed framework.

# Enhanced Performance of Handover in 3G Mobile Networks

Saied M. Abd El-atty

## **Abstract**

In this paper, we propose an enhanced packet scheduling scheme to favour UEs that experienced handover (HO) in 3G mobile networks based-WCDMA system. The main idea of the proposed scheme is not only prioritized the HO connections at the CAC level but also prioritized the HO connections at the scheduler level. At the CAC level, a guard code scheme favours HO calls over new calls. At the scheduler level, a Packet Scheduler based-HandOver Class (PS-HOC) scheme makes use of the elapsed time of HO connections to classify the HO requests into prioritized HO and non-prioritized HO calls. However, PS-HOC sorts the connections based on their delay sensitivity and their channel quality. The performance of the proposed scheme is compared with delay driven scheduler (DDS) scheme [3] in terms of average packet delay, average queue size and average packet dropping rate. The simulation results show the effectiveness of our proposed scheme.



# EFFICIENT CONNECTION ADMISSION CONTROL BASED-CODE SEARCHING ALGORITHM IN 3G/MESH NETWORKS

Saied M. Abd El-atty and Konstantinos Lizos

## **Abstract**

Code allocation procedure in 3G mobile networks is provided by utilizing the OVVSF channelization codes. In OVVSF system, blocking of an incoming call (new or handover) can be characterized either as capacity blocking or as code blocking. Therefore, we propose an efficient CAC policy based on guard code scheme to reduce the failure rate of the handover (HO) calls due to code capacity shortage and at the same time CAC policy utilizes two code searching strategies (single code search (SCS) and multiple code search (MCS)) to mitigate the blocking due to code blocking. The adopted analysis of the proposed CAC is based on Markov chain model. The performance evaluation at code-level is measured in terms of code utilization, handover call failure rate and new call blocking probability.

# PERFORMANCE ANALYSIS OF MULTIHOP CONNECTIVITY IN VANET

Saied M. Abd El-atty and Georgios K. Stamatou

## **Abstract**

This paper investigates the performance of Multihop connectivity for inter-vehicle communication (IVC) systems in Vehicular Ad Hoc NETWORK (VANET). The hop path between two or more vehicles is dedicated when a broadcast signaling for initiation connectivity is successfully guaranteed. In addition, the performance of vehicular connectivity is not only based on maximum transmission range, but also based on the optimal distance headway. A new analytical model is proposed in order to determine the failure probability of connectivity based on distance headway, false initiation connectivity probability and broadcast signaling delay. Also, the successful probability of message hopping and outage connectivity probability are provided in Multihop vehicular ad hoc networks. The numerical results demonstrate the metrics performance of false and failure connectivity probability in terms of physical characteristics of the roadway, vehicular velocity, traffic density and broadcast signaling delay.

# **RADIO RESOURCE MANAGEMENT FOR HANDOFF PROVISIONING IN WCDMA SYSTEMS**

Saied M. Abd El-atty, Dimitrios N. Skoutas, Angelos N. Rouskas, and Karetos, G.T

## **Abstract**

In this paper we propose an effective combination of a call admission control (CAC) mechanism together with a traffic scheduling algorithm. These two schemes are designed for WCDMA systems and operate in a complementary fashion in order to support handoff provisioning. The CAC mechanism belongs to the well known family of guard channel schemes and reserves some code capacity to favor the continuation of handover (HO) calls over the new calls. During the handoff procedure the HO calls experience high delays as a number of packets have to be forwarded through the wireline infrastructure to the target cell. Thus, we employ a delay driven traffic scheduler (DDS) which aims to prioritize calls which experience high delays such as HO calls. Furthermore, DDS is able to exploit information from the physical layer in order to avoid erroneous packets transmissions and increases system performance. The simulation results, demonstrate the effectiveness of our proposed scheme.

# HANDOVER PROVISIONING IN WCDMA SYSTEMS

Saied M. Abd El-atty, Dimitrios N. Skoutas, and Angelos N. Rouskas

## Abstract

In this paper, we propose a prioritization of handover (HO) calls over new calls in WCDMA systems employing orthogonal variable spreading factor (OVSF) codes as channelization codes. The code occupancy of the system is modeled by a Markov chain and the differentiation between HO and new call is performed at the code level by introducing a “guard code” scheme. The scheme belongs to the well known family of guard channel schemes and reserves some code capacity to favor the continuation of HO calls over the new calls. As the management of the general case is intractable, we solve certain numerical instances of the problem and manage to calculate several popular performance metrics like new call blocking and HO failure probabilities and code utilization.

## analytical model for Mobile User Connectivity in Coexisting Femtocell/Macrocell Networks

Saied M. Abd El-atty and Z. M. Gharseldien

## Abstract

In this paper we investigate the performance of mobile user connectivity in femtocell/macrocell networks. The femto user equipment (FUE) can connect to femto access point (FAP) with low communication range rather than higher communication range to macro base station (MBS). Furthermore, in such emerging networks, the spatial reuse of resources is permissible and the transmission range can be decreased, then the probability of connectivity is high. Thereby in this study, we propose a tractable analytical model for the connectivity probability based on communication range and the mobility of mobile users in femtocell/macrocell networks. Further, we study the interplays between outage probability and spectral efficiency in such networks. Numerical results demonstrate the effectiveness of computing the connectivity probability in femtocell/macrocell networks.

# Improving Handover Performance in Wireless Mobile Networks

Saied M. Abd El-atty and Konstantinos Lizos

## **Abstract**

In this paper, we propose an enhanced packet scheduling scheme to favour UEs that experienced handover (HO) in wireless mobile networks. The main idea of the proposed scheme is not only prioritized the HO connections at the CAC level but also prioritized the HO connections at the scheduler level. At the CAC level, a guard code scheme favours HO calls over new calls. At the scheduler level, a Packet Scheduler based-HandOver Class (PS-HOC) scheme makes use of the elapsed time of HO connections to classify the HO requests into prioritized HO and non-prioritized HO calls. Further, PS-HOC sorts the connections based on their delay sensitivity and their channel quality. The performance of the proposed scheme is compared with delay driven scheduler (DDS) scheme in terms of average packet delay, average queue size and average packet dropping rate. The simulation results show the effectiveness of our proposed scheme.

# Enhanced Uplink Scheduling for Continuous Connectivity in High Speed Packet Access Systems

Saied M. Abd El-atty and Konstantinos Lizos

## **Abstract**

The efficiency of high speed packet access (HSPA) systems is mainly based on channel quality information (CQI) reports transmitted by user equipment (UE) to Node B. In this paper, we propose an improved CQI prediction scheme based on a finite state Markov chain (FSMC) model for wireless channel, in order to reduce CQI signaling overhead in the HSPA system. Then, we introduce an enhanced uplink packet scheduling (EUPS) scheme to provide quality of services (QoS) guaranteed for continuous packet connectivity in the enhanced uplink (EUL). EUPS serves the active UEs not only according to buffer status but also according to reported state of the wireless channel of each UE. The performance of the proposed scheme in terms of average packet delay, average packet drop and average cell throughput is compared to the classical scheduler of 3GPP standards. The simulation results show the effectiveness of the proposed scheme.

# A Cross Layer Scheduling Framework for Supporting Bursty Data Applications in WCDMA Networks

Saied M. Abd El-atty, Dimitrios N. Skoutas, Angelos N. Rouskas and George T. Karetzos

## **Abstract**

In future wireless networks multimedia applications are expected to finally dominate the overall traffic volume. Shared channels are more suitable for the transmission of this type of traffic, as they are able to periodically adjust their transmission rate. In this paper, we introduce a cross-layer framework for WCDMA based networks which aims to make the packet scheduling procedure more efficient. In addition to that, we further propose a traffic scheduling scheme which serves the connections not only according to their delay sensitivity, but also according to the predicted state of their wireless channel. The efficiency of the proposed scheme, in terms of average packet delay and channel utilization is verified via simulations.

# Guard Code Scheme for Handover traffic Management in WCDMA Systems

Dimitrios N. Skoutas, Saied M. Abd El-atty, and Angelos N. Rouskas

## **Abstract**

A key performance indicator of mobile wireless networks is failure probability of handover calls. In this paper, we propose a Call Admission Control policy which prioritizes handover calls over new calls in WCDMA systems. The OVSF code occupancy of the system is modeled by a Markov chain and the differentiation between handover and new calls is performed at the code level by introducing a “guard code” scheme. The scheme belongs to the wellknown family of guard channel schemes and reserves some code capacity to favor the continuation of handover calls over the new calls. As the management of the general case is intractable, we solve certain numerical instances of the problem and manage to calculate several performance metrics like new call blocking and handover failure probabilities and code utilization. We complete our study with simulation results in the case of higher OVSF code tree capacity.



# Reducing CQI signaling overhead in HSPA

Saied M. Abd El-atty, Dimitrios N. Skoutas, and Angelos N. Rouskas

## Abstract

The efficiency of adaptive modulation and coding (AMC) procedure in high speed Downlink packet access (HSDPA) depends on the frequency of the channel quality information (CQI) reports transmitted by the UE to Node B. The more frequent the reports are the more accurate the link adaptation procedure is. On the other hand, the frequent CQI reports increase uplink interference, reducing thus the signal reception quality at the uplink. In this study, we propose an improved CQI reporting scheme which aims to reduce the required CQI signaling by exploiting a CQI prediction method based on a finite-state Markov chain (FSMC) model of the wireless channel. The simulation results show that under a high downlink traffic load, the proposed scheme has a near-to optimum performance while produces less interference compared to the respective periodic CQI scheme.

الأبحاث

Publication Saied M. Abd El-atty

## Improving Handover Performance in Wireless Mobile Networks( )

Saied M. Abd El-atty and Konstantinos Lizos

### Abstract

In this paper, we propose an enhanced packet scheduling scheme to favour UEs that experienced handover (HO) in wireless mobile networks. The main idea of the proposed

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scheme makes use of the elapsed time of HO connections to classify the HO requests into prioritized HO and non-prioritized HO calls. Further, PS-HOC sorts the connections based on their delay sensitivity and their channel quality. The performance of

the proposed scheme is compared with delay driven scheduler (DDS) scheme in terms of

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## Enhanced Uplink Scheduling for Continuous Connectivity in

## High Speed Packet Access Systems( )

Saied M. Abd El-atty\* and Konstantinos Lizos\*\*

### Abstract

The efficiency of high-speed packet access (HSPA) systems is mainly based on channel quality information (CQI) reports transmitted by user equipment (UE) to Node B. In this paper, we propose an improved CQI prediction scheme based on a finite state Markov chain (FSMC) model for wireless channel, in order to reduce CQI signaling overhead in the HSPA system. Then, we introduce an enhanced uplink packet scheduling (EUPS) scheme to provide quality of services (QoS) guaranteed for continuous packet connectivity in the enhanced uplink (EUL). EUPS serves the active UEs not only according to buffer status but also according to reported state of the wireless channel of each UE. The performance of the proposed scheme in terms of average packet delay, average packet drop and average cell throughput is compared to the classical scheduler of GPP standards. The simulation results show the effectiveness of the proposed scheme.

atty Publication Saied M. Abd El- s

## **A Cross Layer Scheduling Framework for Supporting Bursty**

### **Data Applications in WCDMA Networks()**

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## **Guard Code Scheme for Handover traffic Management in WCDMA Systems()**

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### **Abstract**

A key performance indicator of mobile wireless networks is failure probability of handover calls. In this paper, we propose a Call Admission Control policy which prioritizes handover calls over new calls in WCDMA systems. The OVSF code occupancy of the system is modeled by a Markov chain and the differentiation between handover and new calls is performed at the code level by introducing a "guard code" scheme. The scheme belongs to the wellknown family of guard channel schemes and reserves some code capacity to favor

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## Reducing CQI signaling overhead in HSPA( )

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The efficiency of adaptive modulation and coding (AMC) procedure in high speed Downlink packet access (HSDPA) depends on the frequency of the channel quality information (CQI) reports transmitted by the UE to Node B. The more frequent the reports are the more accurate the link adaptation procedure is. On the other hand, the frequent CQI reports increase uplink interference, reducing thus the signal reception quality at the uplink. In this study, we propose an improved CQI reporting scheme which aims to reduce the required CQI signaling by exploiting a CQI prediction method based on a finite-state Markov chain (FSMC) model of the wireless channel. The simulation results show that under a high downlink traffic load, the proposed scheme has a near-to optimum performance while produces less interference compared to the respective periodic CQI scheme.

Publication Saied M. Abd El- s

## A Novel Packet Scheduling for High Speed Bursty Traffic in

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Saied M. Abd El-atty and Konstantinos Lizos

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Third Generation partnership project long term evolution ( \_GPP LTE) requires low complexity, efficient scheduling policies to sustain optimal system operation while maintaining high level Quality of Service (QoS) to each active traffic flow. In sequel, the fairness principle is crucial in the design of a robust scheduler, due to buffer status, spectrum allocation limitations, intra-cell interference restrictions and delay requirements. In this paper, we propose two novel schedulers for LTE \_G networks, capable of supporting high speed bursty data, namely Delay Threshold Normalized Scheduler (DTNS) and Queue Packet Normalized Scheduler (QPNS). Both schedulers are founded on the concept of overall traffic flow queue evaluation, in a recursive manner. In addition, the packet scheduling procedure is jointly designed to operate within a cross-layer framework, incorporating variations of the LTE wireless channel. For comparison purposes, we show that the proposed schedulers outperform adopted, \_G schedulers on the average service delay and packet loss, while maintaining low per-slot in-processing complexity.

## Uplink Scheduling for Continuous Connectivity in High Speed Packet Access Systems( )

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Markov chain (FSMC) model for wireless channel, in order to reduce CQI signaling overhead in the HSPA system. Then, we introduce an enhanced uplink packet scheduling (EUPS) scheme to provide quality of services (QoS) guaranteed for continuous packet connectivity in the enhanced uplink (EUL). EUPS serves the active UEs not only according to buffer status but also according to reported state of the wireless channel of each UE. The performance of the proposed scheme in terms of average packet delay, average packet drop and average cell throughput is compared to the classical scheduler of  $\_GPP$  standards. The simulation results show the effectiveness of the proposed scheme.

## Vehicular Communications Framework for Efficient Multihop Connectivity in AHVN( )

Saied M. Abd El-atty

Abstract

The advanced heterogeneous vehicular network (AHVN) is a new paradigm for future vehicular networks. AHVN is an integrated architecture between the VANET and the existing cellular wireless networks. This paper introduces a vehicular communications framework for efficient Multihop connectivity in AHVN. The vehicular communication in VANET is based on the failure probability of vehicular connectivity. However, the vehicular communications to cellular networks ( $V\_I$ ) depends on the access failure probability to radio channel in base station (or Node B). We proposed a Multihop vehicular connectivity model in VANET which depends on the optimal headway distance, false initiation connectivity and the received signal strength (RSS). Then we determine the failure probability of vehicular connectivity (Pf) in Multihop VANET. Subsequently, we employ Pf as a handover criterion in order to establish a communication link with  $V\_I$  when the VANET connectivity fails. Therefore, we propose an efficient multiple access scheme based-code reservation for resource management in AHVN, and then we can determine the failure access probability by employing a Markov chain model. The analysis of the proposed framework in terms of throughput, delay and access failure probability is driven. The numerical results demonstrate the effectiveness of the proposed framework.

atty Publication Saied M. Abd El- s

## Enhanced Performance of Handover in $\_G$ Mobile Networks()

Saied M. Abd El-atty

Abstract

In this paper, we propose an enhanced packet scheduling scheme to favour UEs that experienced handover (HO) in  $\_G$  mobile networks based-WCDMA system. The main idea of the proposed scheme is not only prioritized the HO connections at the CAC level but also prioritized the HO connections at the scheduler level. At the CAC level, a guard code scheme favours HO calls over new calls. At the scheduler level, a Packet Scheduler based-HandOver Class (PS-HOC) scheme makes use of the elapsed time of HO connections to classify the HO requests into prioritized HO and non-prioritized HO calls. However, PS-HOC sorts the connections based on their delay sensitivity and their channel quality. The performance of the proposed scheme is compared with delay driven scheduler (DDS) scheme [ ] in terms of average packet delay, average queue size and average packet dropping rate. The simulation results show the effectiveness of our proposed scheme.

## Efficient Connection Admission Control Based-Code Searching Algorithm in $\_G$ /Mesh Networks( )

Saied M. Abd El-atty and Konstantinos Lizos

Abstract

Code allocation procedure in  $G$  mobile networks is provided by utilizing the OVSF channelization codes. In OVSF system, blocking of an incoming call (new or handover) can be characterized either as capacity blocking or as code blocking. Therefore, we propose an efficient CAC policy based on guard code scheme to reduce the failure rate of the handover (HO) calls due to code capacity shortage and at the same time CAC policy utilizes two code searching strategies (single code search (SCS) and multiple code search (MCS)) to mitigate the blocking due to code blocking. The adopted analysis of the proposed CAC is based on Markov chain model. The performance evaluation at code-level is measured in terms of code utilization, handover call failure rate and new call blocking probability.

## Performance Analysis of Multihop Connectivity in VANET( $\square$ )

Saied M. Abd El-atty and Georgios K. Stamatou

Abstract

This paper investigates the performance of Multihop connectivity for inter-vehicle communication (IVC) systems in Vehicular Ad Hoc Network (VANET). The hop path between two or more vehicles is dedicated when a broadcast signaling for initiation connectivity is successfully guaranteed. In addition, the performance of vehicular connectivity is not only based on maximum transmission range, but also based on the optimal distance headway. A new analytical model is proposed in order to determine the failure probability of connectivity based on distance headway, false initiation connectivity probability and broadcast signaling delay. Also, the successful probability of message hopping and outage connectivity probability are provided in Multihop vehicular ad hoc networks. The numerical results demonstrate the metrics performance of false and failure connectivity probability in terms of physical characteristics of the roadway, vehicular velocity, traffic density and broadcast signaling delay.

atty Publication Saied M. Abd El- s

## Radio Resource Management for Handoff Provisioning in WCDMA Systems( $\square$ )

Saied M. Abd El-atty, Dimitrios N. Skoutas, and Angelos N. Rouskas

Abstract

In this paper we propose an effective combination of a call admission control (CAC) mechanism together with a traffic scheduling algorithm. These two schemes are designed for WCDMA systems and operate in a complementary fashion in order to support handoff provisioning. The CAC mechanism belongs to the well known family of guard channel schemes and reserves some code capacity to favor the continuation of handover (HO) calls over the new calls. During the handoff procedure the HO calls experience high delays as a number of packets have to be forwarded through the wireline infrastructure to the target cell. Thus, we employ a delay driven traffic scheduler (DDS) which aims to prioritize calls which experience high delays such as HO calls. Furthermore, DDS is able to exploit information from the physical layer in order to avoid erroneous

packets transmissions and increases system performance. The simulation results, demonstrate the effectiveness of our proposed scheme.

## Handover Provisioning in WCDMA Systems( )

Saied M. Abd El-atty, Dimitrios N. Skoutas, Angelos N. Rouskas and George T. Karetsos

Abstract

In this paper, we propose a prioritization of handover (HO) calls over new calls in WCDMA systems employing orthogonal variable spreading factor (OVSF) codes as channelization codes. The code occupancy of the system is modeled by a Markov chain and the differentiation between HO and new call is performed at the code level by introducing a "guard code" scheme. The scheme belongs to the well known family of guard channel schemes and reserves some code capacity to favor the continuation of HO calls over the new calls. As the management of the general case is intractable, we solve certain numerical instances of the problem and manage to calculate several popular performance metrics like new call blocking and HO failure probabilities and code utilization.

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