

## **Mohamad ASSAAD**

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## **Highlights**

- Expert for the French National Research Agency (ANR)
- Consultant to different international companies
- Experience in WCDMA/HSDPA PHY/MAC (involved in several international project +several international publications)
- Experience in OFDMA MAC/PHY optimization and design (involved in several international project +several international publications)
- Experience in cellular planning
- Strong analytical skills
- Expertise in modeling complex systems
- Involved in many international conference technical program committee
- Several international journal and conference papers
- Author of one book on HSDPA

## **Education**

- Doctorate of Philosophy Ph.D. in Telecommunications: March 2006.  
Ecole Nationale Supérieure des Télécommunications (ENST) and Institut National des Télécommunications (INT) - France.  
Thesis Title : Cross Layer Study in High Speed Downlink Packet Access (HSDPA) System
- DEA (Diplome d'Etudes Approfondies, the french equivalent of the Master degree) in Telecommunications with highest honor (Rank 2/53) : 09/2002.  
Ecole Nationale Supérieure des Télécommunications (ENST) Paris.
- Electrical and Electronics Engineering degree with highest honor (Rank 1) : 09/2001,  
Lebanese University, Beirut, Lebanon.

## **Research Activities**

- Cross layer design in OFDMA systems
- Theoretical resource allocation techniques in OFDMA (LTE, WiMAX) and CDMA (HSDPA) systems
- Scheduling techniques for multi-service users in OFDMA (LTE, WiMAX) and CDMA (HSDPA) systems
- Impact of channel estimation errors and feedback delays on resource allocation
- Inter-cell interference coordination/management in multi-cell OFDMA systems
- Resource allocation in MIMO/beamforming systems
- Interactions between wireless MAC/RLC layer, network layer (routing) and TCP protocol
- Cooperative diversity (distributed MIMO, relaying, resource allocation)

## **Funded Research Projects**

- **OPUS**: advanced studies of PHY and MAC layers in OFDMA Downlink system (RNRT national project with FTR&D-Mitsubishi-CEA-Teamcast-Eurecom) (January 2006 → December 2007)
- **APOGEE**: advanced studies of PHY and MAC layers in OFDMA uplink system (RNRT national project with FTR&D-Mitsubishi-CEA-Teamcast-Eurecom) (January 2008 → December 2009)
- **RAF**: cooperative diversity and relaying in OFDMA systems (French national project with THALES-ALCATEL-EADS and several academic partners) (January 2008 → December 2010)
- **WIMAGIC** (STREP European project): advanced PHY, MAC and Network layers studies in MIMO WiMAX at high speed (January 2008 → December 2009)
- **NEWCOM++**: European network of Excellence January 2008 → December 2009)
- **URC**: advanced PHY/MAC studies in heterogeneous MIMO systems (resource allocation, DSA, relaying, etc.) national project (20 partners) (January 2007 → December 2009)
- **Streaming in HSDPA** -Scheduling and CAC study: project funded by France Telecom R&D (January 2004 → December 2005).
- **ALMERIA** ( ALgorithmes Multi-couches et Evaluation des Réseaux pour l'accès Internet avec Antennes MIMO) – Cross Layer Design in MIMO systems: national project with ENST-Paris and Eurecom (January 2005 → December 2005).

## **Current Ph.D. Students**

- Naveed Ul Hassan: cross layer optimization in OFDMA system, (October 2006 → October 2009)
- Christophe Gaie: resource allocation in heterogeneous networks (funded by Motorola), (October 2006 → October 2009)
- Hassan Ayoub: Interference coordination in multi cell OFDMA networks (April 2008 → April 2011)

## **Current Msc. Students**

- Ahmad Ayaz, resource optimization in OFDMA with imperfect Channel knowledge
- Muhammed Saleem Shoeib cross layer optimization in uplink SC-FDMA
- Maxim Girnyk, joint scheduling and resourced allocation in cooperative networks
- Youcef Ben Alia, Interference coordination in OFDMA system
- Mohamad Aidibi, Impact of limited signalling on frequency scheduling in multi carrier wireless systems

## **Past Msc. Students**

- Ines SLAMA, MS. student, scheduling study for streaming services in HSDPA system, (March 2005 → September 2005)
- Nuraj Pradhan, MS. student, cell planning and resource allocation in HSUPA system, (October 2005 → April 2006)

## **Miscellaneous**

- Expert for the French National Research Agency (ANR)
- Member, IEEE and IEEE Communications Society.
- TPC for several International conferences.
- Reviewer for major IEEE Communications Society transactions.

## **Language skills**

- Bilingual in French and Arabic
- Fluent in English

## **Publications**

- **Book**

1. Mohamad Assaad and Djamel Zeghlache : « TCP Performance over UMTS-HSDPA System » published by Taylor and Francis, CRC Press NY, 07/2006.

- **Patent**

1. M. Assaad and A. mourad, “Method and apparatus for sharing multi-dimensional resources between multiple applications in communication and storage systems”, European patent 07020811.1, filed.

- **Journal papers**

1. Mohamad Assaad and Djamel Zeghlache : « Effect of Circuit Switched Services on HSDPA Cell Capacity », IEEE Transactions on Wireless Communications, accepted.
2. Mohamad Assaad and Djamel Zeghlache : « Cross Layer Design in HSDPA System », IEEE Journal on Selected Areas in Communications (JSAC), accepted.
3. M. Assaad and D. Zeghlache, “How to minimize the TCP Effect in a UMTS-HSDPA System”, Wiley Wireless Communications and Mobile Computing (WCMC), accepted.
4. M. Assaad, B. Jouaber and D. Zeghlache, "TCP Performance over UMTS-HSDPA System", Kluwer on Telecommunication Systems 27:2-4, 371-391, 2004.
5. Mohamad Assaad and Djamel Zeghlache : « HSDPA Cell throughput under Nakagami fading channel », IEEE Transactions on vehicular Technologies, accepted with minor revisions.
6. Mohamad Assaad and Djamel Zeghlache : « Opportunistic Scheduling performance for HSDPA in the presence of CS services », IEEE Transactions on Wireless Communications, submitted.
7. Mohamad Assaad and Alain Mourad, “Opportunistic scheduling for multi services in OFDMA system” IEEE Transactions on Vehicular Technologies, submitted.
8. Mohamad Assaad: « distributed resource optimization in multi-cell OFDMA system », IEEE Transactions on Wireless communications, submitted.
9. Naveed Ul Hassan and Mohamad Assaad: « Low Complexity Margin adaptive resource allocation in Downlink MIMO-OFDMA system », IEEE Communications letter, submitted.
10. Naveed Ul Hassan and Mohamad Assaad, “Power Efficient Scheduling and Resource Allocation with Strict Delay Constraints in OFDMA system”, IEEE Transactions on Wireless Communications, submitted.

- **Conference papers**

1. M. Assaad, B. Jouaber and D. Zeghlache, "Effect of TCP on UMTS/HSDPA System Performance and Capacity", IEEE Global Telecommunications Conference, GLOBECOM '04, Dallas. Volume: 6 , 29 Nov.-3 Dec., 2004, Pages:4104 – 4108.
2. M. Assaad and D. Zeghlache, ”Scheduler Study in HSDPA System”, IEEE PIMRC 2005, accepted.
3. M. Assaad and D. Zeghlache, "On the Capacity of HSDPA System", Global Telecommunications Conference, 2003. GLOBECOM '03. IEEE ,Volume: 1, 1-5 Dec. 2003, Pages: 60 – 64.
4. M. Assaad and D. Zeghlache, "Comparison between MIMO techniques in a UMTS-HSDPA System", IEEE International Symposium on Spread Sprectrum Techniques and Applications ISSSTA, 30 Aug.-2 Sept. 2004, Sydney, Pages 874-878.
5. M. Assaad and D. Zeghlache, “Fast Scheduling in HSDPA System: A Trade-off Between Fairness and Efficiency”, IEEE WPMC 2005, accepted.
6. M. Assaad and D. Zeghlache, "MIMO/HSDPA with Fast Fading and Mobility: Capacity and Coverage Study", 15th IEEE International Symposium on Personal, Indoor and Mobile Radio Communications, PIMRC 2004, Volume: 3 , 5-8 Sept. 2004, Barcelona, Pages:2181 – 2186.

7. M. Assaad, B. Jouaber and D. Zeghlache, "TCP Performance over UMTS-HSDPA System", ICN'04 Guadeloupe, French Caribbean, March 2004, Vol.2, (Gosier, February-Mars 2004), p. 874-878.
8. M. Assaad and D. Zeghlache, "scheduling for streaming services in HSDPA system", IEEE PIMRC 2006, Finland.
9. M. Assaad and A. Mourad, "New Frequency-Time Scheduling Algorithms for 3GPP/LTE-like OFDMA Air Interface in the Downlink", IEEE VTC Spring 2008, accepted.
10. Naveed UL Hassan and M. Assaad, "Margin Adaptive Resource Allocation in Downlink Multiuser MIMO-OFDMA system with Multiuser Eigenmode Transmission", IEEE SPAWC 2008, accepted.
11. D.T. Phan Huy, R. Legouable, D. Kténas, L. Brunel, M. Assaad, "Downlink B3G MIMO OFDMA Link and System Level Performance", IEEE VTC Spring 2008, accepted.
12. Christophe Gaie, Mohamad Assaad, Markus Muck, Pierre Duhamel, "Distributed Discrete Resource Optimization in Heterogeneous Networks", IEEE SPAWC 2008, accepted.
13. Mohamad Assaad, "Optimal Fractional Frequency Reuse (FFR) in Multicellular OFDMA system", IEEE VTC Fall 2008, submitted.
14. Mohamad Assaad, "[\*Frequency-Time Scheduling for Streaming Services in OFDMA system\*](#)", IEEE PIMRC 2008, submitted.
15. Naveed UI Hassan and Mohamad Assaad, "[\*Resource Allocation in Multiuser OFDMA System: Feasibility and Optimization Study\*](#)", IEEE Globecom 2008, submitted.

- **Theses**

1. Mohamad Assaad, « Cross Layer Study in High Speed Downlink Packet Access (HSDPA) System », Doctorate of Philosophy thesis, March 2006.
2. Mohamad Assaad, "HSDPA Cell planning-Analytical estimation of cell capacity", DEA thesis, Sep. 2002.
3. Mohamad Assaad, "Comparison between OFDM/QAM and OFDM/OQAM », Electrical and Electronics Engineering Degree thesis, Aug. 2001.