

# CURRICULUM VITAE

## Rachid El-Azouzi

**Birth** : Rabat (Morocco), 17th February 1971

**Family Status** : Married, two children.

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### Profession:

- 09/03 - : Associate Professor, LIA, University of Avignon
- 11/01 - 08/03: Expert Engineer, Mistral project-team, INRIA, France.
- 11/00 - 10/01: Postdoctoral fellow, Mistral project-team, INRIA, France.

### Degrees:

- October 2000: PhD degree in Computer Sciences from the Mohammed V University, Rabat, Morocco *Advisor*: Abbad Mohammed, *Title* "Perturbation des Systèmes Dynamiques Hybrides à Deux Joueurs"
- Marsh 1997 DEA (Diplôme d'Etudes Approfondies), the french equivalent of the Master degree) in operations research, Mohammed V University, Rabat, Morocco.
- Baccalauréat Mathematics, Rabat, Morocco.

### Awards:

- Best paper Award, The 3rd International Conference on Mobile Ad-hoc and Sensor Networks (MSN 2007) 12-14 December 2007, Beijing, China
- Best paper Award, General Symposium, IEEE Globcom, 26-30 November 2007, Washington, DC, USA.
- Best paper Award ex-aequo, Networking 2006, 15-19 MAY, Coimbra, Portugal

### Research Interests:

- Networking Games And Biologically Inspired Networks
- Design of communication protocols for WIMAX (802.16) networks
- Wireless MAC protocols design and evaluation
- Intelligent wireless networks and learning algorithms
- Vehicular wireless communications
- Cross-layer design of wireless networks
- QoS support in IEEE 802.11 and MANET networks

- Radio resource management of heterogeneous wireless networks
- Multihoming and mobility management
- Delay Tolerant Networking.
- Mean Field Interaction Models for networks
- Singular perturbation analysis of piecewise deterministic systems
- TCP behavior in wired and wireless networks

## Research Projects:

- ANR Ecocell (2009-2012) (*responsible* for LIA) ANR French project led by Alcatel-Lucent.
- RNRT WiNEM (WiMAX Networks Engineering and Multihoming) (2007-2010): the objective of WiNEM is develop new mechanisms in order to enhance the performance of WiMAX mobile systems.
- IST FET European project BIONETS (Integrated Project BIOlogically-inspired autonomic NETworks and Services) (2007-2009)
- ARC : Popeye (POPulation, gameE, theorY and Evolution)(2008-2009)
- CEFIPRA : Emerging Strategies for Wireless Communication Networks (2009-2012)
- Project with Maroc Telecom R&D : UMTS and HSDPA : Protocols, Applications, and Performance (2007-2010).
- ARC IFANY (Information theory: New challenges and new interdisciplinary tools) (2006-2007)
- Project with France Telecom “Networking games” (2000-2003)
- Color Purpura « Peer to Peer in ad-hoc networks, 2007.

## Professional activities:

- General Co-Chair for Wiopt 2010 (Avignon, France)
- Chair for Gamecomm 2007 workshop (Nantes, France)
- Guest editor for Telecommunication Systems Journal dedicated to GameComm 2008 and GameComm2007.
- Program Committee co-chair for Bionetics Conference 2009 (Avignon, France).
- Organized and chaired an invited session in Gamenets 2009 (Istanbul, Turkey)
- Technical Program Committee member for ), Valeutools 2009 (Piza, Italy) , Wiopt 2009 (Seoul, Korea), GameComm 2009 (Piza, Italy), Bionetics 2009 (Avignon, France), NGNS 2009 (Rabat, Morocco), PIMRC 2008 (Cannes, France), Valeutools 2008 (Athens, Greece), GameComm2008 (Athens, Greece), Rawnet/WNC 2009 (Seoul, Korea), Rawnet 2008 (Berlin, Germany), WNC 2008 (Berlin, Germany), Valeutools 2007 (Nantes, France), GameComm 2007 (Nantes, France),
- Responsible of the speciality RTM (Networks, Telecoms and Multimedia), Professional of the Master (MsC) Computer Engineering and Mathematic, Techniques and Sciences of the University of Avignon 2006-2008.
- Co-Responsible of the Master (MsC) Computer Engineering and Mathematic, Techniques and Sciences of the University of Avignon 2008-.
- Responsible of the project WINPAP (Wireless Networks : Protocols, Applications, and Performance) in LIA.
- Referee for many international conferences (INFOCOM, Wiopt, Valuetools, CDC, ISCC, Netcoop, Nstools, GLOBECOM, NETWORKING, WiOpt, ISCC, ASIAN, Net-Con,

GameComm, Rawnet, WNC, Gamenets...) and journals (Transactions on Wireless Communications, JSAC, Performance Evaluation, IEEE Networks, Computer Networks, Computer Communications, Transactions on Information Theory, Wireless Networks, Mobile Networks and Applications...)

### Industrial collaborations:

- Partner of the Winem ANR French project led by Motorola and France Telecom.
- Partner of the Ecocell ANR French project led by Alcatel-Lucent.
- Project with Maroc Telecom R&D : UMTS and HSDPA : Protocols, Applications, and Performance.
- Collaboration with Alctel Lab and Maestro INRIA on small cells networks
- Collaboration with France Telecom on Networking game.

### Teaching activities:

- Courses in Master of Telecommunications and Networks (University of Avignon)
  - Wireless Networks
    - Cellular Networks design
    - Wireless Communications and Futur applications
    - Wireless Local Area Networks
  - System Administration and Network services
    - Networks and services
    - Networks Administrator
    - Next Generation Networks
  - Networks security
    - Cryptography, information security and E-Commerce
    - Wireless networks Security
  - Optimization and stochastic process
  - Performance evaluation in Networking
- Course on Wireless communication, (2004-2009), Master ESIL, Département Internet, University of Marseille
- Course in game theory, University of Nice-Sophia Antipolis, 2002, 2003

### PhD students :

- Sabir EsSaid : Started in October 2007. Thesis title : Multihoming in heterogeneous wireless networks.
- Hamidou Tembine. Started in October 2006. Thesis title: "Evolutionary Games in Wireless Networks.
- Khalil brahimi. Started in October 2006. Thesis title : Ressource allocation in wireless networks.
- Thierry Peyre. Graduated in December 2008. Thesis title; Performance evaluation of IEEE802.16 WiMax.
- Abdelatif Kobbane. Graduated in Sptember 2008. Thesis title “*Capacity* of UMTS and HSDPA Cellular Network in *Multiservices* Environments.
- Ralph Ek-Khoury. in Sptember 2008. Thesis title: QoS in ad-hoc networks.

- Mohammed El-Kamili. Graduated in September 2005. Thesis title "Routing and flow control games.

## Publications

### Book Chapters

1. Tijani Chahed, Ikkal Msaada, Rachid El-Azouzi, Fethi Filali, Salah-Eddine Elayoubi, Benoit Fourestié, Ikkal Msaada, Thierry Peyre, and Chadi Tarhini, « WiMAX network capacity and radio resource management », Hermes Publisher 2008.
2. Benslimane, O. Moussaoui, et R. El-Azouzi, "*Protocoles de multicast hiérarchique avec qualité de service*", 2005 Livre : Multicast Multimédia sur Internet, HERMES Science Publiher, mars 2005.
3. R. El-Azouzi, E. Altman and O. Pourtallier, "*Properties of Equilibria in Routing Problems in Networks with Several Types*", 2005 Dynamic Games : Theory and Application, Ed. par A. Haurie et G. Zaccour, Springer, 2005.
4. R. El-Azouzi, M. El Kamili, E. Altman, M. Abbad and T. Basar, "*Combined Competitive Flow Control and Routing in Multi-User Communication Networks with Hard side Constraints*", 2005 Analysis Control and Optimization of Complex Dynamic Systems, Editors E. K. Boukas and R. P. Malhamé, pages 169-192, 2005.

### Journals

5. R. El-Azouzi, Essaid Sabir, Tania Jimenez and El-Houssine Bouyakhf, "Modeling Slotted Aloha as a Stochastic Game with Random Discrete Power Selection Algorithms," To appear in Journal of Computer Systems, Networks, and Communications, 2010
6. H. Tembiné, E. Altman, R. El-Azouzi, Y. Hayel, "Bio-inspired Delayed Evolutionary Game Dynamics with Networking Applications, to appear in Telecommunication Systems Journal, 2009.
7. H. Tembiné, E. Altman, R. El-Azouzi, Y. Hayel, " to appear in IEEE Transaction On systems, MAN and Cyberbetics, 2010.
8. H. Tembiné, Y. Hayel, E. Altman, R. El-Azouzi, "Markov Decision Evolutionary Games with Individual Energy Management, to appear Annals the International Society of Dynamic Games.
9. E. Altman, Y. Hayel, R. El-Azouzi and H. Tembiné, "Markov Decision Evolutionary Games with Expected Average Fitness., Evolutionary Ecology Research Journal, Special issue in honour of Thomas Vincent (Joel S. Brown & Tania L. S. Vincent, Eds), May 2009.

10. Hayel, Y. Lasaulce, S, El-Azouzi, R. and Debbah, M. , *Introducing hierarchy in energy games*, To appear in IEEE Transactions on Wireless Communications, 2009.
11. Eitan Altman, Rachid El-Azouzi, Yezekael Hayel and Hamidou Tembine, "The evolution of transport protocols: An evolutionary game perspective", To appear in Computer Networks, 2009.
12. R. El-Khoury, E. Altman and R. El-Azouzi "Analysis of Scalable TCP" To appear in COMCOM : special Journal issue "Heterogeneous Networks: Traffic Engineering and Performance Evaluation", 2009
13. R. El-Khoury and R. El-Azouzi, "Modeling the Effect of Forwarding in IEEE 802.11e-Based Ad Hoc Networks with Weighted Fair Queueing" To appear in the Ad Hoc & Sensor Wireless Networks, An International Journal, 2009
14. S. Yousef, E. Altman, R. El-Azouzi and M. Fathy "Analytical model for connectivity in vehicular ad hoc networks" IEEE Transactions on Vehicular Technology, Vol. 57, Issue: 6, pages: 3341-3356, 2008.
15. A. Kherani, R. El-Khoury, R. El-Azouzi and E. Altman, "Stability-Throughput Tradeoff and Routing in Multi-Hop Wireless Ad-Hoc Networks", Computer Networks, Volume 52 , Issue 7 , May, 2008.
16. S. Yousefi, E. Altman and R. El-Azouz, "Improving connectivity in vehicular ad hoc networks: an analytical study" Computer Communications, Vol? 31, Issue 9, Pages 1653-1659, June 2008.
17. K. Ibrahim, R. El-Azouzi, A. Kobbane and H. Bouyakhf "WCDMA uplink system capacity: Singular perturbation approach" Applied Mathematical Sciences, 2008
18. E. Altman and R. El-Azouzi "La théorie des jeux non-coopératifs appliquée aux réseaux de télécommunication" Annales des Télécommunications, Vol. 62, 7-8, July-August 2007.
19. A. Altman, K. Avrachenkov, N. Boneau, M. Debbah, R. El-Azouzi and D. S. Menasche "Constrained cost-coupled stochastic games with independent state processes", Operations Research Letters, Volume 35, 2007.
20. M. El Kamili, M. Abbad and R. ElAzouzi, "The problem on capacity addition in multi-user Elastic demand communication Networks, ZOR Mathematic Methods of Operations Research, VOL 63; NUMBER 3, pages 461-471, 2006.
21. E. Altman, R El-Azouzi and T. Jimenez, "Slotted Aloha as a Stochastic Game with Partial Information", Computer Networks 45, pages 701-713, 2005.
22. R. ElAzouzi E. Altman, and O. Pourtallier , " Braess paradox and properties of wardrop equilibrium in some multiservice networks, In A. Haurie and G. Zaccour, editors, Dynamic Games: Theory and Applications, volume 10 of GERAD 25th Anniversary, pages 56-77. springer, 2005.
23. E. Altman, R. El-Azouzi, B. Tuffin and D. Ros "Loss Strategies for Competing TCP/IP Connections" Computer Networks, vol. 50, no 11, p. 1799-1815, 2006.

24. R. El-Azouzi, M. El Kamili, E. Altman, M. Abbad and T. Bassar, Combined Competitive Flow Control and Routing in Multi-User Communication Network with Hard Side-Constraints, Analysis Control and Optimization of Complex Dynamic Systems, Editors E. K. Boukas and R. P. Malham 2004
25. E. Altman, T. Boulogne, R. El-Azouzi, T Jiménez and L. Wynter, " A survey on networking games", Computers and Operations Research, 2004.
26. R. El-Azouzi, M. Abbad, E. Altman, "A Taylor series expansion for H-infinity control of perturbed Markov jump linear system, Annals of the International Society of Dynamic Games, volume 7, 2004
27. E. Altman, R. El-Azouzi and O. Pourtallier," Avoiding Paradoxes in Multi-agent competitive Routing , Computer Networks, Vol. 43, Issue 2, pages 133-146, 2003.
28. R. El-Azouzi and E. Altman " Constrained Traffic Equilibrium in Routing", IEEE Transaction on Automatic Control, vol. 48, Issue. 9 pages. 1656-1660, sept 2003
29. E. Altman, R. El-Azouzi and A. Vyacheslav," , Non-Cooperative Routing in Loss Networks", Performance Evaluation, an International journal, Vol 49, Issue 1-4, pp 43-55, 2002.
30. R. El-Azouzi, M. Abbad, E. Altman, "Perturbation of Multivariable Linear Quadratic Systems with Jump Parameters and Hybrid Controls", IEEE, Trans Automat. Control, VOL. 46, NO, 10, October, 2001.
31. R. El-Azouzi, M. Abbad, E. Altman, "Perturbation of linear quadratic systems with jump parameters and hybrid controls", ZOR Mathematical Methods of Operations Research, 51, No. 3, 2000.

## Conferences

32. V. Kavitha, E. Altman, R. El-Azouzi and R. Sundaresan, "Fair scheduling in cellular systems in the presence of noncooperative mobiles" To appear in INFOCOM, 2010
33. Vijay Kamble<sup>✉</sup>, Eitan Altman, Rachid El-Azouzi and Vinod Sharma, *A Theoretical Framework for Hierarchical Routing Games*, To appear in INFOCOM, 2010
34. El-Azouzi rachid, Sidi Habib B.A. Sidi, Rojas-Mora Julio and Azad Amar. Game theory and learning algorithm in Delay Tolerant Network
35. Issam Mabrouki, Yezekael Hayel and Rachid El-Azzouzi. An Ant-Based Model for Contact Time Analysis in Delay-Tolerant Networks
36. Jean Yves Le Boudec, El-Azouzi and Eitan Altman, " From mean field interaction to evolutionary game dynamics, in Proc. of 2st Workshop on Physics-Inspired Paradigms in Wireless Communications and Networks (Physcomnet), June 2009.

37. Jean Yves Le Boudec, El-Azouzi and Eitan Altman, "Mean Field Asymptotic of Markov Decision Evolutionary Games and Teams, in the proceedings of GameNets, May 2009.
38. T. Peyre and R. El-Azouzi, "EEE802.16e Cell Capacity including mobility management and QoS Differentiation", to appear in the proceeding IEEE WCNC, Budapest, Hungary, 2009
39. E. Altman, R. El-Azouzi, Y. Hayel and H. Tembine, "Correlated Evolutionary Stable Strategies in Random Medium Access Control" To appear in the proceeding of Gamanets, 13-15 May, Istanbul, Turkey, 2009
40. E. Sabir, R. El-Azouzi and Y. Hayel and H. Tembine, "A Hierarchical Slotted Aloha Game", To appear in the proceeding of Gamanets, 13-15 May, Istanbul, Turkey, 2009.
41. T. Peyre, R. El-Azouzi, T. Chahed, "QoS Differentiation for Initial and Bandwidth request ranging in 802.16", IEEE PIMRC, Cannes, Septembe, 2008.
42. T. Peyre, K. Ibrahim, and R. El-Azouzi, "IEEE802.16 Multi-class Capacity including AMC scheme and QoS Differentiation for Initial and Bandwidth Request Ranging", In the proceeding of valuetools 20-24 October, Athens, Greece, 2008.
43. E. Altman, Y. Hayel, T. Hamidou, R. El-Azouzi, "Markov Decision Evolutionary Games with Time Average Expected Fitness Criterion", In the proceeding of valuetools 20-24 October, Athens, Greece, 2008.
44. Y. Hayel, S. Lasaulce, R. El-Azouzi and M. Debbah, "Introducing Hierarchy in Energy-Efficient Power Control Games", In the proceeding of valuetools 20-24 October, Athens, Greece, 2008.
45. H. Tembine, E. Altman, R. El-Azouzi and Y. Hayel, "Stochastic Population Games with individual independent states and coupled constraints", In the proceeding of valuetools 20-24 October, Athens, Greece, 2008
46. H. Tembine, E. Altman, R. El-Azouzi and William H. Sandholm, "Evolutionary game dynamics with migration for hybrid power control in wireless communications", 2008 "to appear in Proc. of 47th IEEE Conference on Decision and Control (CDC), December 8-11, Cancun, Mexico, 2008
47. H. Tembine, E. Altman, R. El-Azouzi and Y. Hayel, "Stable Networking Games", 2008 "in proc. of The Forty-Sixth Annual Allerton Conference on Communication, Control, and Computing, Allerton Retreat Center, Monticello, Illinois, Sept 23 - 26, 2008
48. H. Tembine, E. Altman, R. El-Azouzi, Yezekael Hayel, "Battery State-dependent Access Control in Solar-powered Broadband Wireless Networks", in the Proceeding of the Second International EuroFGI Conference on Network Control and Optimization (NETCOOP 2008), September 8-10 Paris, France, 2008.
49. E. Altman, R. El-Azouzi and Y. Hayel and H. Tembine "Evolutionary power control games in wireless networks", in the proceeding of Networking, May 2, Singapore, 2008.

50. H. Tembine, E. Altman, R. El-Azouzi and Y. Hayel, "Evolutionary games with random number of interacting players applied to access control", in the proceeding of Wiopt conference, March 31 - April 4, Berlin, Germany 2008.
51. E. Altman, R. El-Azouzi, Y. Hayel and H. Tembine, "An Evolutionary Game approach for the design of congestion control protocols in wireless networks" , Physicomnet, Berlin, April 4, 2008.
52. H. Tembine, E. Altman and R. El-Azouzi, "Delayed Evolutionary Game Dynamics applied to Medium Access Control", Bionetworking, Oct 8, Pisa, Italy, 2007
53. R. El-Khoury, R. El-Azouzi "Modeling the effect of forwarding in a multi-hop ad hoc networks with weighted fair queueing, in the proceeding of the 3rd International Conference on Mobile Ad-hoc and Sensor Networks (MSN 2007), Springer s LNCS, 12-14 December 2007, Beijing, China, ( **Best paper Award** ), 2007
54. E. Altman, K. Avrachenkov, N. Bonneau, M. Debbah, R. El-Azouzi and D. Menasche "Constrained Stochastic Games in Wireless Networks" in the proceeding of IEEE Globecom 2007, 26-30 Nov. Washington, DC, USA ( **Best paper Award** ) , 2007.
55. R. El-Azouzi, E. S. Sabir, S. Benarfa, T. Jimenez and E. H. Bouyakhf "Cooperative and noncooperative control for slotted aloha with random power level selections algorithm" in the proceeding of Valuetools/ACM, Nantes, France, 2007
56. T. Peyre and R. El-Azouzi "Performance Analysis of Single Cell IEEE 802.16e Wireless MAN", in the proceeding of 32nd Annual IEEE Conference on Local Computer Networks (LCN), Dublin, Ireland, 2007.
57. S. Youssefi, E. Altman and R. El-Azouzi "Connectivity in vehicular ad hoc networks in presence of wireless mobile base-stations", in the proceeding of 7th International Conference on ITS Telecommunications, 6-8 June,. 2007 on the French Riviera (Côte d'Azur), 2007.
58. A. Kobbane, R. El-Azouzi, K. Ibrahim and E.H. Bouyakhf "Capacity Evaluation of multi-service W-CDMA : A Spectral Analysis Approach", The Sixth IASTED International Conference on Communication Systems and Networks, CSN.
59. S. Yousefi, E. Altman and R. El-Azouzi "Study of connectivity in vehicular ad hoc networks", SPASWIN 2007 , Limassol, Chypre 2007.
60. R. El-Khoury and R. El-Azouzi "Stability-throughput analysis in a multi-hop ad hoc networks with weighted fair queueing", in the proceeding of the 45th Annual Allerton Conference on Communication, Control, and Computing (Allerton 07), (Monticello, IL), Sept. 2007.
61. R. El Khoury and R. El-Azouzi "Dynamic Retransmission Limit Scheme for Routing in Multi-hop Ad hoc Networks", Inter-Perf 2007 workshop, ACM, 26 October 2007, Nantes, France.



62. Tembine Hamidou, Eitan Altman, El-Azouzi Rachid, Yezekael Hayel, "Multiple Access Game in Ad-hoc Network", The First International Workshop on Game Theory for Communication networks (GameComm), 22 October 2007, Nantes, France
63. H. Tembine, E. Altman and R. El-Azouzi " Delayed Evolutionary Game Dynamics applied to Medium Access Control", Bionetworking 2007, Oct 8, Pisa, Italy
64. A. Kherani, R. El-Azouzi and E. Altman "Stability-Throughput tradeoff and routing in multi-hop wireless ad-hoc networks", in the proceeding of Networking Conference 2006, 15, 19 MAY, Coimbra, Portugal 2006 ( **Best paper Award** ).
65. R. El-Azouzi, T. Peyre and A. Benslimane "Optimal design of hybrid FEC/ARQ scheme for real-time applications in wireless networks", 2st Workshop on Wireless Multimedia Networking and Performance Modeling (WMuNeP 2006), Malaga, Spain, October 2006.
66. A. Benslimane, R. El-Khoury, R. El-Azouzi and S. Pierre "Energy power-aware routing in OLSR protocol", in the proceedings of Mobile Computing and Wireless Communications, Amman - Jordan, 17-20 September 2006.
67. E. Altman, D. Barman, A. Benslimane and R. El-Azouzi and , "Slotted Aloha with priorities and random power, in proceeding of Networking, Otario, Canada, pages 610-622, 2005
68. E. Altman, D. Barman, R. El-Azouzi and T. Jimenez, "A game theoretic approach for delay minimization in slotted aloha", in the proceedong of International Conference on Communications (ICC 2004), Paris, France, 2004.
69. D. Barman, I. Matta, E. Altman, R. El-Azouzi, "TCP Optimization through FEC, ARQ and transmission Power Tradeoffs", 2nd Conference on Wired/wireless Internet Communications, Frankfurt, Germany, 2004
70. E. Altman, R. El-Azouzi, B. Tuffin and D. Ros "Loss Strategies for Competing TCP/IP Connections" in the proceeding of NETWORKING Conference 2004, May 9-14 Athens, Greece 2004
71. E. Altman, D. Barman R. El-Azouzi, B. Tuffin and D. Ros "Pricing Differentiated Services: A Game-Theoretic Approach" in the proceeding of NETWORKING Conference 2004, May 9-14 Athens, Greece 2004
72. E. Altman, R. El-Azouzi and T. Jimenez, "Slotted Aloha as a Stochastic Game with Partial Information", in proceeding of WiOpt'03 : Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks, INRIA Sophia Antipolis, France, March 3-5, 2003.
73. R. El-Azouzi, and E. Altman, "Queueing Analysis of Link-Layer Losses in Wireless Networks", in the proceeding of Personal Wireless Communications 2003, September 23-25, Venice, Italy.
74. R. El-Azouzi, E. Altman and L. Wynter, "Telecommunications Network Equilibrium with Price and Quality-of-Service Characteristics", in the proceeding of 18th ITC 2003 Conference, *Berlin*, Germany 31 August - 5 September, 2003.

75. R. El-Azouzi, E. Altman and O. Pourtallier, "Properties of Equilibria in Routing Problems in Networks with Several Types", Proceedings of 41th IEEE Conference on Decision & Control, Las Vegas, Nevada, USA, Decembre, 2002.
76. E. Altman, R. El-Azouzi and A. Vyacheslav, "Non-Cooperative Routing in Loss Networks", in the Proceedings of Performance 2002 Conference, Rome, Sept. 2002.
77. E. Altman, R. El-Azouzi, T. Basar and R. Srikant "Combined Competitive Flow Control and Routing Games", Workshop Networking Games and Resource Allocation, Petrozavodsk, Russia, July 12-15, 2002.
78. R. El-Azouzi, "Avoiding Paradox in Routing Games in Networks when Travel Demand is Elastic", in the proceeding of the Tenth International Symposium on Dynamic Game and Applications, Saint-Petersburg, Russia, 2002
79. E. Altman, R. El-Azouzi and O. Pourtallier, "Avoiding Paradoxes in Routing Games", in the proceedings of the Seventeenth International Teletraffic Congress 2001, Brazil, September, 24-28, 2001.
80. R. El-Azouzi and E. Altman "Side Constrained Traffic Equilibrium in Multiuser Communication Networks", in proceedings of the 39th Annual Allerton Conference on Communication, Control, and Computing, Champaign, USA, October, 3-5, 2001.
81. R. El-Azouzi, M. Abbad, E. Altman, "A Taylor series expansion for  $H^\infty$  control of perturbed Markov jump linear system", Ninth international symposium on dynamic game and applications, Adelaide, South Australia, Decembre, 2000.
82. R. El-Azouzi, E. Altman and V. Gaitsgory, "The averaging principle for perturbations of continuous time control problems with fast controlled jump parameters", Proceedings of 39th IEEE Conference on Decision & control, Sydney Australia, Decembre, 2000.
83. R. El-Azouzi, M. Abbad, E. Altman, "Perturbation of Multivariable Linear Quadratic Systems with Jump Parameters and Hybrid Controls", Programmation dynamique et systemes a evenements discrets, INRIA, Sophia Antipolis 1999. .