

Curriculum Vitae

November 11, 2011

:: PERSONAL DATA

Name: **Peter**
Surname: **Jacko**
Gender: **Male**
Date of Birth: **June 23, 1980**
Place of Birth: **Košice, Slovakia**
Citizenship: **Slovakia (EU)**
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:: PRESENT EMPLOYMENT DATA

Position: **Postdoctoral Fellow**
Address: **Basque Center for Applied Mathematics
Bizkaia Technology Park
Building 500
481 60 Derio (Bilbao)
Spain**
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:: PERSONAL CHARACTERISTICS

Responsible, independent, analytically thinking, proactive, motivating, enthusiastic, tolerant, patient

:: EDUCATION

Ph.D. cum laude, *Business Administration and Quantitative Methods*, Universidad Carlos III de Madrid, Spain 2009
• Thesis: *Marginal Productivity Index Policies for Dynamic Priority Allocation in Restless Bandit Models*
DEA (M.Sc. equivalent), *Statistics and Operations Research*, Universidad Carlos III de Madrid, Spain 2006
• Thesis: *Mathematical Programming Approach to Dynamic Resource Allocation Problems*
Mgr. (M.Sc. equivalent), *Mathematics*, P. J. Šafárik University in Košice, Slovakia 2003
• Thesis: *Distance Colorings of Graphs*
Bc. (B.Sc. equivalent), *Mathematics*, P. J. Šafárik University in Košice, Slovakia 2002

:: EMPLOYMENT HISTORY

Basque Center for Applied Mathematics, Spain 2009 –
• Postdoctoral Fellow in Networks group
Universidad Carlos III de Madrid, Spain 2003 – 2009
• Research Personnel Formation (FPI) Fellow in Department of Statistics (2005 – 2009)
• Teaching Assistant in Department of Business Administration (2003 – 2005)

:: RESEARCH

INTERESTS

Stochastic Operations Research, Performance Evaluation, Optimization in Graphs and Networks
Resource Allocation in Dynamic and Stochastic Systems, Stochastic Scheduling, Restless Bandit Problems
Markov Decision Processes, Lagrangian Relaxation, Dynamic Programming, Index Policies
Communications Systems: Wireless Data Networks (CDMA2000 1xEV-DO, LTE), Internet (TCP, CCN)
Business Administration: Revenue Management

METRICS

H-index: 3 source: Publish or Perish, 2011
Erdős number: 3 source: MathSciNet Calculator, 2011

BOOK

P. Jacko. *Dynamic Priority Allocation in Restless Bandit Models*. Lambert Academic Publishing, 2010. Invited book.

PATENT

- U. Ayesta and P. Jacko. Method for selecting a transmission channel within a time division multiple access (TDMA) communications system. Filed 2010.

WORK IN PROGRESS

- K. Avrachenkov, U. Ayesta, J. Doncel, and P. Jacko. Congestion control of flows in Internet routers by means of index policies. 2011. Status 11/2011: Submitted.
- D. Graczová and P. Jacko. Generalized restless bandits and knapsack problem for perishable inventories. 2011. Status 09/2011: Submitted.
- P. Jacko. Resource capacity allocation to stochastic dynamic competitors: Knapsack problem for perishable items and index-knapsack heuristic. 2011. Status 09/2011: Submitted.
- P. Jacko and J. Niño-Mora. Marginal productivity index policies for problems of admission control and routing to parallel queues with delay. Universidad Carlos III de Madrid, Working paper 08-72, Statistics and Econometrics Series 25, December 2008.

PUBLICATIONS (PEER-REVIEWED OR INVITED)

- P. Jacko and B. Sansò. Optimal anticipative congestion control of flows with time-varying input stream. *Performance Evaluation*, 2011. Status 10/2011: Accepted.
- P. Jacko. Value of information in optimal flow-level scheduling of users with Markovian time-varying channels. *Performance Evaluation*, 68(11):1022–1036, 2011a. Special Issue: Performance 2011. Acceptance rate: 20%.
- U. Ayesta, M. Erausquin, and P. Jacko. Resource-sharing in a single server with time-varying capacity. In *Proceedings of Forty-Ninth Annual Allerton Conference on Communication, Control, and Computing*, 2011a. Invited paper.
- P. Jacko. Optimal index rules for single resource allocation to stochastic dynamic competitors. In *Proceedings of ValueTools*, ACM Digital Library, 2011b. Invited paper.
- U. Ayesta, P. Jacko, and V. Novak. A nearly-optimal index rule for scheduling of users with abandonment. In *Proceedings of IEEE Infocom 2011*, pages 2835–2843, 2011b. Acceptance rate: 16%.
- U. Ayesta, M. Erausquin, and P. Jacko. A modeling framework for optimizing the flow-level scheduling with time-varying channels. *Performance Evaluation*, 67:1014–1029, 2010. Special Issue: Performance 2010. Acceptance rate: 26%.
- P. Jacko. Restless bandits approach to the job scheduling problem and its extensions. In A. B. Piunovskiy, editor, *Modern Trends in Controlled Stochastic Processes: Theory and Applications*, pages 248–267. Luniver Press, United Kingdom, 2010. Invited book chapter.
- P. Jacko. Adaptive greedy rules for dynamic and stochastic resource capacity allocation problems. *Medium for Econometric Applications*, 17(4):10–16, 2009. Available online at <http://www.met-online.nl>. Invited paper.
- P. Jacko and J. Niño-Mora. Admission control and routing to parallel queues with delayed information via marginal productivity indices. In *Proceedings of the Third International Conference on Performance Evaluation Methodologies and Tools (ValueTools)*, ACM International Conference Proceeding Series. ICST Gent, 2008. Acceptance rate: 40%.
- P. Jacko and B. Sansò. Congestion avoidance with future-path information. In *Proceedings of the EuroFGI Workshop on IP QoS and Traffic Control*, pages 153–160. IST Press, 2007.
- P. Jacko and J. Niño-Mora. Time-constrained restless bandits and the knapsack problem for perishable items (extended abstract). *Electronic Notes in Discrete Mathematics*, 28:145–152, 2007.
- P. Jacko and S. Jendrol'. Distance coloring of the hexagonal lattice. *Discussiones Mathematicae Graph Theory*, 25(1-2):151–166, 2005.

CONFERENCE PRESENTATIONS

- P. Jacko*. Value of information in optimal flow-level scheduling of users with Markovian time-varying channels. Young European Queueing Theorists (YEQT V) Workshop; Eindhoven, Netherlands, October 2011a. Invited talk.

- P. Jacko*. Value of information in optimal flow-level scheduling of users with Markovian time-varying channels. IFIP WG 7.3 International Symposium on Computer Performance, Modeling, Measurements and Evaluation (Performance); Amsterdam, Netherlands, October 2011b. Acceptance rate: 20%.
- U. Ayesta*, M. Erausquin, and P. Jacko. Resource-sharing in a single server with time-varying capacity. Forty-Ninth Annual Allerton Conference on Communication, Control, and Computing, September 2011. Invited talk.
- U. Ayesta and P. Jacko*. Nearly-optimal index rules for some non-work-conserving systems. INFORMS APS Conference, July 2011.
- P. Jacko*. Nearly-optimal solutions to dynamic and stochastic resource capacity allocation problems. INFORMS APS Conference, July 2011c.
- D. Graczová* and P. Jacko. Knapsack problem for perishable inventories. Prague Economic Meeting, June 2011.
- P. Jacko*. Knapsack problem for perishable items, index-knapsack heuristic, and nearly-optimal revenue management. BCAM Workshop on Bandit Models and Applications, May 2011d.
- P. Jacko*. Optimal index rules for single resource allocation to stochastic dynamic competitors. Fifth International ICST Conference on Performance Evaluation Methodologies and Tools (ValueTools), May 2011e. Invited talk.
- U. Ayesta, P. Jacko, and V. Novák*. A nearly-optimal index rule for scheduling of users with abandonment. IEEE Infocom, April 2011. Acceptance rate 16% (291/1823).
- U. Ayesta, M. Erausquin, and P. Jacko*. A modeling framework for optimizing the flow-level scheduling with time-varying channels. IFIP WG 7.3 International Symposium on Computer Performance, Modeling, Measurements and Evaluation (Performance); Namur, Belgium, November 2010a. Acceptance rate 26% (20/78).
- U. Ayesta, M. Erausquin, and P. Jacko*. Flow-level scheduling with time-varying channels. Workshop on Modern Trends in Controlled Stochastic Processes; University of Liverpool, UK, July 2010b. Invited talk.
- P. Jacko*. Analysis of Markov chains with pentadiagonal matrix via Möbius transformation and Lucas sequences. Orthogonal Polynomials Workshop; University of Warwick, UK, July 2010a.
- P. Jacko*. On the multi-armed bandit problem and its Lagrangian relaxation. International Workshop on Applied Probability; Colmenarejo, Spain, July 2010b.
- P. Jacko*. Adaptive greedy rules based on dynamic prices. Bratislava Economic Meeting; Bratislava, Slovakia, June 2010c.
- P. Jacko*. A nearly-optimal solution to stochastic and dynamic resource allocation problems. Math-Physics Alumni Workshop; Bratislava, Slovakia, December 2009a. Invited talk.
- P. Jacko*. An optimal index policy for the multi-armed bandit problem with re-initializing bandits. Young European Queueing Theorists (YEQT III) Workshop; Eindhoven, Netherlands, November 2009b. Invited talk.
- P. Jacko* and J. Niño-Mora. Admission control and routing to parallel queues with delayed information via marginal productivity indices. Third International Conference on Performance Evaluation Methodologies and Tools (ValueTools); Athens, Greece, October 2008. Acceptance rate 40% (30/75).
- P. Jacko*. Optimal dynamic promotion and the knapsack problem for perishable items. VIIIth Annual Conference of INFORMS Revenue Management and Pricing Section; Montreal, Canada, June 2008. Awarded a MITACS Student Grant; among 5 out of 16 submissions; 1000 CAD.
- P. Jacko* and B. Sansò. Congestion avoidance with future-path information. EuroFGI Workshop on IP QoS and Traffic Control; Lisbon, Portugal, December 2007.
- P. Jacko* and J. Niño-Mora. Time-constrained restless bandits and the knapsack problem for perishable items. Sixth Czech-Slovak International Symposium on Combinatorics, Graph Theory, Algorithms and Applications; Prague, Czech Republic, July 2006.
- P. Jacko* and S. Jendrol'. Some bounds for labeling with a condition at distance two. 1st Workshop on Frequency Assignment Problems in Wireless Networks; Siena, Italy, October 2005.
- S. Jendrol'* and P. Jacko. Distance coloring of the hexagonal lattice. 10th Workshop on Graph Theory Colourings, Independence and Domination; Karpacz, Poland, September 2003.
- P. Jacko and A. Marcinová*. The distance colouring of regular tilings of the plane. Graphs 2002; Rejviz, Czech Republic, May 2002.

RESEARCH STAYS

- INRIA, Sophia-Antipolis, France 1 week in 2010; 2 months in 2010; 1 week in 2011
• collaboration with Konstantin Avrachenkov
- GERAD, HEC Montréal, Canada 4 months in 2007; 1 week in 2008
• collaboration with Brunilde Sansò

INTERNATIONAL PROJECTS

- “EURO-FGI: Design and Engineering of the Future Generation Internet — Towards Convergent Multi-Service Networks” 2006 – 08
• European Commission; Local PI: J. Niño-Mora; participant
- “EURO-NGI: Design and Engineering of the Next Generation Internet Towards Convergent Multi-Service Networks” 2003 – 06
• European Commission; Local PI: J. Niño-Mora; participant

NATIONAL PROJECTS

- “Efficient control methods and algorithms for dynamic resource-sharing systems” 2011 – 13
• Spain, Ministerio de Ciencia e Innovación; PI: U. Ayesta; participant
- “Baliabideen banatze algoritmoak hurrengo generazioko sareetan” 2010 – 12
• Spain, Basque Government; PI: U. Ayesta; participant
- “Modelos de Ayuda a la Toma de Decisiones en Presencia de Incertidumbre” 2009 – 09
• Spain, Comunidad de Madrid-UC3M; PI: F. J. Nogales; participant
- “Optimización de Sistemas de Grandes Dimensiones Mediante Programación Matemática” 2008 – 08
• Spain, Comunidad de Madrid-UC3M; PI: J. Niño-Mora; participant
- “Métodos y Modelos de Optimización para Sistemas Dinámicos y Estocásticos” 2007 – 10
• Spain, Ministerio de Educación y Ciencia; PI: J. Niño-Mora; participant
- “Modelos de Optimización Dinámica, Estocástica y Combinatoria de Sistemas Tecnológicos, Logísticos y Financieros” 2007 – 08
• Spain, Comunidad de Madrid-UC3M; PI: J. Niño-Mora; participant
- “Modelos de Optimización Dinámica Estocástica y Combinatoria de Sistemas Productivos, Logísticos y Financieros” 2006 – 06
• Spain, Comunidad de Madrid-UC3M; PI: J. Niño-Mora; participant
- “Métodos, Formulaciones y Algoritmos para la Solución de Modelos de Optimización Dinámicos y Estocásticos Mediante Programación Matemática” 2004 – 07
• Spain, Ministerio de Educación y Ciencia; PI: J. Niño-Mora; participant

INDUSTRIAL PROJECTS

- “Minimización del Consumo Energético en Redes Ferroviarias” 2011 –
• Spain, INGETEAM TRACTION-BCAM; PI: U. Ayesta; participant

:: EXPERIENCE

STUDENT RESEARCH SUPERVISION

- Martin Erausquin (PhD. thesis collaborator), UPV/EHU, Spain (Performance 2010 & Allerton 2011) 2010 –
- Josu Doncel (MSc. thesis supervisor, 1/2), UPV/EHU, Spain (submitted paper) 2011
- Darina Graczova (PhD. thesis collaborator), Comenius University, Slovakia (submitted paper) 2011
- Vladimir Novak (BSc. thesis supervisor, 1/2), Comenius University, Slovakia (Infocom 2011) 2010 – 2011

REFEREEING

Performance Evaluation, Queueing Systems: Theory and Applications, Annals of Applied Probability, European Journal of Operational Research, International Journal of Mobile Network Design and Innovation	
TPC member of International Teletraffic Congress (ITC24)	2012
International Conference on Network Games, Control and Optimization (NetGCoOp)	2011
International Conference on New Technologies, Mobility and Security	2008

TEACHING ASSISTANTSHIPS

Department of Statistics, Universidad Carlos III de Madrid, Spain	2005 – 2009
• Winter 2006/2007: <i>Operations Research</i> , in English/Spanish, graduate course	
• Fall 2006/2007: <i>Operations Research</i> , in Spanish	
• Winter 2005/2006: <i>Operations Research</i> , in English/Spanish, graduate course	
• Fall 2005/2006: <i>Operations Research</i> , in Spanish, two groups	
Department of Business Administration, Universidad Carlos III de Madrid, Spain	2003 – 2005
• Fall 2004/2005: <i>Financial Economics</i> , in Spanish, two groups	
• Fall 2004/2005: <i>Accounting Analysis</i> , in English	
• Spring 2003/2004: <i>Financial Management</i> , in Spanish	
• Fall 2003/2004: <i>Financial Economics</i> , in English	

SCIENTIFIC ADMINISTRATION

Basque Center for Applied Mathematics, Spain	2010 –
• Scientific coordinator for BCAM Internship program (2011 –)	
• Member of scientific evaluation panel for International call for researchers and PhD students (2010)	

VOLUNTARISM

Nadácia Ingenium (Ingenium Foundation), Slovakia	2001 – 2007
• founding <i>executive board member</i> (2001 – 2007)	
Združenie STROM (STROM Association), Slovakia	1995 – 2004
• <i>president and member of executive board</i> (2000 – 2003)	
• co-organizer of math contests, meetings and summer/winter schools	

:: AWARDS AND GRANTS

Co-funding for several conferences and short visits	2006 –
Research stay grant, INRIA, France; 3000 EUR	2010
Dept. of Statistics Logo Design Contest winner (with Dae-Jin Lee), Univ. Carlos III de Madrid, Spain	2008
Student grant, MITACS, Canada; 1000 CAD	2008
Research stay grant, Ministry of Education and Science, Spain; 8130 EUR	2007
Research Personnel Formation (FPI) Fellowship, Ministry of Education and Science, Spain; ≈56000 EUR	2005
Student grant, CRM, Canada; 1000 CAD	2004
Teaching Assistant Fellowship, Universidad Carlos III de Madrid, Spain; ≈12000 EUR	2003, 2004
The Praise Appreciation of Dean, P. J. Šafárik University in Košice, Slovakia	2003
Socrates/Erasmus grant, European Commission	2002
The Prize of Rector on occasion of the Students' Day, P. J. Šafárik University in Košice, Slovakia	2001
The Praise of Director, Gymnázium Poštová 9 Secondary School in Košice, Slovakia	1996, 1997, 1998

:: FURTHER EDUCATION

GRADUATE-LEVEL COURSES

- University of Ulm, Germany 2006
- EuroNGI Course on *Stochastic Networks*
- Universidad de Cantabria, Spain 2006
- 3rd EuroNGI Summer School on *NGI Network Strategy, Design and Dimensioning*
- CRM, Université de Montréal, Canada 2004
- Graduate Training School on *Stochastic Calculus for Applications: Theory and Numerics*
 - awarded a 1000 CAD grant for living and travel expenses

UNDERGRADUATE-LEVEL COURSES

- Universidad Carlos III de Madrid, Spain 2002
- 24 ECTS credits in coursework from *Business Administration* program as Socrates/Erasmus student
- Technical University of Košice, Slovakia 1998 – 2002
- 161 ECTS credits in coursework from *Finance, Banking and Investments* program

:: SKILLS AND ABILITIES

LANGUAGES

- English, Spanish — immersion in 2003
- German, Russian — basic level
- Slovak, Czech — native

COMPUTERS

- Programming — extended skills in Matlab, Maple, Xpress-MP, T_EX, Pascal, Delphi, HTML/CSS, PHP

:: REFERENCES

Urtzi Ayesta, Ph.D.

- Ikerbasque Research Professor, Basque Center for Applied Mathematics
- Office address: Bizkaia Technology Park, Building 500, 481 60 Derio, Spain
- E-mail: ayesta@bcamath.org; Phone: +34-94-656 7842

Brunilde Sansò, P.eng., M.Sc.A., Ph.D.

- Full Professor, Department of Electrical Engineering, École Polytechnique de Montréal
- Office address: C.P. 6079, succ. Centre-ville, Montréal (QC) H3C 3A7, Canada
- E-mail: brunilde.sanso@polymtl.ca; Phone: +1-514-340 4711, ext. 4949

Konstantin Avrachenkov, Ph.D.

- Senior Researcher (INRIA CR1), MAESTRO Team, INRIA Sophia-Antipolis
- Office address: 2004, route des Lucioles, B.P.93, 06902, Sophia Antipolis Cedex, France
- E-mail: k.avrachenkov@sophia.inria.fr; Phone: +33-(0)4-9238 7751

Stanislav Jendrol', prof., RNDr., DrSc.

- Full Professor, Institute of Mathematics, P. J. Šafárik University in Košice
- Office address: Jesenná 5, 041 54 Košice, Slovakia
- E-mail: stanislav.jendrol@upjs.sk; Phone: +421-55-622 2944

Francisco Javier Prieto, Ph.D.

- Full Professor, Department of Statistics, Universidad Carlos III de Madrid
- Office address: C/ Madrid 126, 289 03 Getafe (Madrid), Spain
- E-mail: franciscojavier.prieto@uc3m.es; Phone: +34-91-624 9850