

Diego Andrés Delle Donne

Personal and contact information

- Nationality: Argentine
- Birth date: February 3, 1981
- DNI: 28.386.253
- Marital status: Single
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Education and achieved degrees

- **Secondary school:** Bachelor, Saint Charles' College, Buenos Aires, Argentina. (grade 7.50)
- **Grade title:** Lic. in Computer Sciences, Universidad de Buenos Aires, Facultad de Ciencias Exactas y Naturales, Feb 2009. (grade 8.22)
 - Degree thesis:** "A Branch & Cut algorithm for a frequency assignment problem in mobile phone networks".
 - Advisor:** Dr. Javier Marengo (FCEyN-UBA, ICI-UNGS).
- **Graduate:** At present, making PhD studies in Computer Sciences in topics related to integer linear programming and graph coloring problems.

Languages

- **English:** Primary and secondary school with languages (advanced level, speaking and writing)
 - Titles:** *First Certificate in English*, University of Cambridge. Certificate grade C.
Practical Business English, London Chamber of Commerce. Pass with Distinction.
- **French:** Secondary school with languages (basic level)
 - Titles:** *First year exam*, Alliance Française.

Academic experience

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|------------------------|--|
| Mar 2008 -
today | Researcher/Teacher
Universidad Nacional de General Sarmiento (UNGS)
Professor 1 st assistant (D2/3), full-time position (part-time until Mar 2010)
Area "Computer sciences", line "Integer linear programming". |
| Mar 2006 -
today | Professor assistant
Subject "Numerical methods" from the Lic. in Computer Sciences, Facultad de Cs. Exactas y Naturales, Universidad de Bs. As.
First assistant, part-time position (second assistant until Mar 2008).
Professor: Dra. Isabel Méndez-Díaz. |
| Aug 2002 -
Jul 2003 | Professor assistant (Ad-Honorem)
Subject "Algorithms and data structures II" from the Lic. in Computer Sciences, Facultad de Cs. Exactas y Naturales, Universidad de Bs. As.
Professor: Prof. Dr. Marcelo Frías. |

Scientific publications

- Delle Donne D. and Marengo J., *Studying playoff qualification in motorsports via mixed-integer programming techniques*. Journal of Sports Engineering and Technology **226** (2012), pp: 32–41, doi: 10.1177/1754337111422480.
- Delle Donne D. and Marengo J., *A branch & cut algorithm for the minimum-adjacency vertex coloring problem*. Discrete Optimization **8** (2011), pp: 540–554, doi: 10.1016/j.disopt.2011.05.003.
- Bonomo, F., Delle Donne D., Durán G. and Marengo J., *Segmentación automática de la Provincia de Buenos Aires para el Censo Nacional Argentino 2010*. Revista Ingeniería de Sistemas **25** (2011), pp: 29–45.
- Delle Donne D., Durán G. and Marengo J., *Solving the segmentation problem for the 2010 Argentine census with integer programming*. Electronic Notes in Discrete Mathematics **37** (2011), pp: 279–284, doi: 10.1016/j.endm.2011.05.048. (extended abstract)
- Braga M., Delle Donne D. and Marengo J., *A polyhedral study of the acyclic coloring problem*. Discrete Applied Mathematics (2012) (in press).
- Cisternas F., Delle Donne D., Durán G., Polgatiz, C. and Weintraub A., *Optimizing salmon farm cage net management using integer programming*. Journal of the Operational Research Society (2012) (in press).

Presentations at conferences

(presenting author marked with *)

- Cisternas F., Delle Donne D.*, Durán G., Polgatiz, C. and Weintraub A., *Optimizing Cage Net Use with Operations Research: A Salmon Farm Pilot Project*. 19th Triennial Conference of the International Federation of Operational Research Societies (IFORS 2011), Melbourne, Australia, July 2011.
- Bonomo F., Delle Donne D., Durán G.* and Marengo J., *Solving the segmentation problem for the 2010 Argentine census with integer programming*. 19th Triennial Conference of the International Federation of Operational Research Societies (IFORS 2011), Melbourne, Australia, July 2011.
- Bonomo F., Delle Donne D.*, Durán G. and Marengo J., *Solving the segmentation problem for the 2010 Argentine census with integer programming*. VI Latin American Algorithms, Graphs and Optimization Symposium (LAGOS '11), Bariloche, Argentina, March 2011.
- Delle Donne D.* and Marengo J., *A polyhedral study of the minimum-adjacency vertex coloring problem*. VI ALIO/EURO Workshop on Applied Combinatorial Optimization, Buenos Aires, Argentina, December 2008.

Attendance at conferences

- 19th Triennial Conference of the International Federation of Operational Research Societies, Melbourne, Australia, July 2011.
- III Congreso de Matemática Aplicada, Computacional e Industrial, Bahía Blanca, Argentina, May 2011.
- VI Latin American Algorithms, Graphs and Optimization Symposium, Bariloche, Argentina, (**organizing committee member**), March 2011.
- ALIO/INFORMS Joint International Meeting, Buenos Aires, Argentina, June 2010.
- V Latin American Algorithms, Graphs and Optimization Symposium, Gramado, Brazil, November 2009.
- Annual meeting of the Unión Matemática Argentina, Mar del Plata, Argentina, September 2009.
- VI ALIO/EURO Workshop on Applied Combinatorial Optimization, Buenos Aires, Argentina, December 2008.
- IV Latin American Algorithms, Graphs and Optimization Symposium, Puerto Varas, Chile, November 2007.

Professional experience

Jun 2010 - Aug 2010	Optimization algorithms for the Populational Census 2010 (<i>part-time, 20 hs/week</i>) Development of optimization tools based on integer linear programming techniques for the automatic allocation of houses to census takers in the Buenos Aires Province, during the planning of the National Populational Census 2010. Contract between FCEN-UBA and "Impronta IT S.A." consultants.
Jan 2009 - Feb 2009	Optimization tool for a salmon farming company in Chile (<i>part-time, 25 hs/week</i>) Development of an optimization tool using an integer programming model for the Chilean company "Salmones Multiexport S.A.". The implemented tool optimizes resources employed for offshore salmon nets maintenance.
Mar 2004 - Mar 2009	Optimization software developer (<i>part-time, 25 hs/week</i>) Software Developer in "Braier & Asociados Consultores". Optimization software development. Linear programming modeling. Heuristic and metaheuristic implementations. Applied projects in OR.
Mar 2003 - Aug 2003	Software developer (<i>part-time, 25 hs/week</i>) Software developer at "NetV S.A.". Development of an application to filter internet contents.
Dec 1998 - Mar 1999	PC repairment (<i>full-time</i>) Independent services in technical support and maintenance of personal computers.

Talks given by invitation

Talk: "Solving the segmentation problem for the 2010 Argentine census with integer programming".

Presentations:

- 7/25/2011: Escuela de Ciencias Informáticas (ECI) 2011, Computer Sciences dept., FCEyN, UBA.
- 5/21/2011: "Charlas de borrachos", Computer Sciences dept., FCEyN, UBA.
- 5/3/2011: "Geek lunch", Hexacta Consultants.
- 12/3/2010: "Las charlas del DC", Computer Sciences dept., FCEyN, UBA.

Human Resources formation activities

- Thesis advisor of Florencia Fernández Slezak (Lic. in Matemáticas - UBA).
Topic: Variants of the automatic house segmentation for populational census using integer programming.
Presented on March, 2012. Co-advisor Dr. Guillermo Durán (UBA).
- Thesis advisor of Hernán Bandura (Lic. in Computer Sciences - UBA).
Topic: A Branch & Cut algorithm for a Lot-Sizing problem. Estimated date of presentation: November, 2012.
- Tutor of student Ezequiel Tevez at the Superior Technician in Informatics career (UNGS))

Academic management experience

2010 - today	Participation in management tasks within the Informatics area at the ICI-UNGS: assigning teachers to courses and timetabling courses.
2008 - today	Sciences Institute alternate representative at the Continuous Education Committee of Universidad Nacional de General Sarmiento.

Acting as member of selection comitees at National Universities

- Computer Sciences department (FCEN, UBA). October 2010. Selection for Professor 2nd Assistants, numerical methods area.

Lic. in Computer Sciences (UBA) qualifications

CBC:		3rd year:	
- Calculus	4	- Algorithms and data structures III	8
- Algebra	7	- Logic and computability	9
- Physics	7	- Operative systems	8
- Chemistry	8	- Software engineering I	8
- IPC	5	- Comunications theory	9
- ICSE	7		
Promedio del CBC:	6.33	4th year:	
1st year:		- Programming languages paradigms	10
- Calculus II	5	- Languages theory	9
- Algebra I	7	- Databases	10
- Probabilities and Statistics	4	- Software engineering II	7
- Algorithms and data structures I	8		
2nd year:		Optional subjects (5th year):	
- Computer organization I	4	- Operations research	10
- Algorithms and data structures II	9	- Quantum computation	7
- Computer organization II	10	- Information visualization	10
- Numerical methods	9	- New data compression techniques	9
		- Algorithms and mathematics in networks (ECI 2007)	9
		Degree thesis:	10
		Average grade:	8.22

Degree thesis

Title: "A Branch & Cut algorithm for a frequency assignment problem in mobile phone networks".

Advisor: Dr. Javier Marengo (FCEyN-UBA, ICI-UNGS).

Presentation date: February 2009.

Abstract: In this work we study a particular way of dealing with interference in combinatorial optimization models representing wireless communication networks. In a typical wireless network, co-channel interference occurs whenever two overlapping antennas use the same frequency channel, and a less critical interference is generated whenever two overlapping antennas use adjacent channels. This motivates the formulation of the minimum-adjacency vertex coloring problem which, given an interference graph G representing the potential interference between the antennas and a set of prespecified colors/channels, asks for a vertex coloring of G minimizing the number of edges receiving adjacent colors.

In this work, three integer programming models are presented for this problem and computational results are provided in order to assess the practical contribution of each one. The best formulation is chosen and a polyhedral study is performed on the polytope asociated. Four facet-defining inequalities are presented for this formulation. Finally, an implementation of a Branch & Cut algorithm is described and its computational results are presented.

Courses taken during PhD studies

- Systems mathematical modelling and simulation. Methodology for computational implementation**
- 2012 Taught by Dra. Begoña Vitoriano from Universidad Complutense de Madrid (Spain) and Dr. Esteban Mocskos from Universidad de Buenos Aires (Argentina) at the Escuela Complutense Latinoamericana (UCM-UBA).
Grade: 9.2/10. Duration: 60 hours
- Algorithms for Optimization under Uncertainty**
- 2011 Taught by Prof. Alberto Marchetti-Spaccamela from the Sapienza University of Rome (Italy) and Prof. Leen Stougie from the VU University Amsterdam (Netherlands) at the Escuela de Ciencias Informáticas, Computer Sciences department, FCEyN, UBA.
Grade: 10/10. Duration: 15 hours
- Polyhedral methods in combinatorial optimization**
- 2010 Taught by Dra. Mariana Escalante and Dra. Valeria Leoni from the Universidad Nacional de Rosario, for the Ph.D. in Science and Technology of the Universidad Nacional de General Sarmiento.
Duration: 1 semester
- Mixed integer programming**
- 2009 Taught by Dra. Mariana Escalante and Dra. Valeria Leoni from the Universidad Nacional de Rosario, for the Ph.D. in Science and Technology of the Universidad Nacional de General Sarmiento.
Duration: 1 semester
- Practical resolution of combinatorial optimization problems**
- 2009 Taught by Dr. Javier Marengo from the Universidad de Buenos Aires, for the Ph.D. in Science and Technology of the Universidad Nacional de General Sarmiento.
Grade: 10/10. Duration: 1 semester

Other courses

- Algorithms and mathematics in networks**
- 2007 Taught by Dr. Fabrizio Luccio at the Escuela de Ciencias Informáticas, Computer Sciences department, FCEyN, UBA.
Grade: 9/10. Duration: 15 hs
- Algorithms complexity analysis**
- 2002 Taught by Dr. Alfredo Viola at the Escuela de Ciencias Informáticas, Computer Sciences department, FCEyN, UBA.
Duration: 15 hs
- Introduction to generic functional programming**
- 2002 Taught by Dr. Alberto Pardo at the Escuela de Ciencias Informáticas, Computer Sciences department, FCEyN, UBA.
Duration: 15 hs
- PC assembling and repairing**
- 1998 Universidad de Buenos Aires.
Duration: 2 months

Technical knowledge

- **General:** PC repairment and configuration.
- **Operative systems:** Windows 95/98/2000, XP, NT; Linux.
- **Programming languages:** C/C++, Java, PHP, ASP, Visual Basic, Haskell, SmallTalk, Prolog, Python, Assembler.
- **Programming IDEs:** Borland C++ Builder 3/5/6, Visual Studio 6.0/.NET, Eclipse, Net Beans.
- **Programming paradigms:** Imperative, Functional, Objects, Logic.
- **Programming technics:** Linear and integer programming, genetic heuristics, dynamic programming, backtracking algorithms, GRASP, local search.
- **Databases:** Design, optimization, SQL.
- **Software engineering:** Software and components design and architecture, software design tools.
- **Other:** HTTP, TCP; HTML; multi-thread programming; sockets and pipes.

Actual activities and interests

- At present, I'm working on my PhD Thesis (in Computer Sciences at Buenos Aires University) under the advise of Dr. Javier Marenco (UBA). The Thesis' main topic concerns the study of several integer programming formulations for different graph coloring problems. The main objective is to obtain complete characterizations for the convex hulls of the politopes associated to these models, over some families of graphs for which it is known that (some of) these problems can be solved in polynomial time. With these results we may be able to complete the polyhedral counterpart of many studies on graph coloring problems, mostly developed by pure combinatorial approaches. As a secondary objective, we pretend to find complete characterizations for politopes associated with unknown complexity problems, proving with this results their polynomiality, if possible.