Nicolas BORIA

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Date of Birth : 20/03/1984
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1. Resume

Education

2007-2011	**Phd. thesis in computer science** *Title : Combinatorial optimization and dynamic environments, Advisor : Vangelis Th. Paschos, President of Jury : Giorgio Ausiello, Jury : Christian Laforest, Cécile Murat, Denis Trystram, Peter Widmayer* LAMSADE - Université Paris Dauphine, Defended on 24/06/2011,
2006–2007	**Master (M2) in Computer Science** *with honors* Université Paris Dauphine
2005–2006	**Agrégation (highest French competitive exam for teachers) in Economy & Management** *successful, ranked 5th* ENS Cachan
2004–2005	**Master (M1) in Management Science** *with honors* Université Paris XII
	Economy Certificate (M1) ENS Cachan
2003–2004	**Licence (L3) in Management Science** Université Paris XII, ENS Cachan
	Licence (L3) in Economy Université Paris I La Sorbonne, ENS Cachan
2001–2003	**Classe préparatoire HEC** Lycée Saint-Just, Lyon

Professionnal Experience

2011	**Post-doctoral grant in computer science** *Title : Combinatorial optimization problems on graphs, and applications to filogenetic inference problems* , Dipartimento di Informatica, Università degli Studi di Torino
2010-2011	**ATER (attaché temporaire à l'enseignement et à la recherche) in Computer Science** LAMSADE Université Paris Dauphine
2007-2010	**Graduate lecturer of computer science** LAMSADE Université Paris Dauphine
2003–2007	**Student & trainee at École normale supérieure**

Voluntary Experience

2007-2011	**Educational tutoring** *Homework, cultural activities, and initiation to photography. In the committee of the association since 2009.* Association Accueil Laghouat, Paris 18ème
2009	**Director of French-German exchange programme** *Exchange between Accueil Laghouat (Paris) and OutReach (Berlin)* Paris, Berlin
2006–2007	**Educational tutoring** Association Fleur de Bitume
2003-2005	**Educational tutoring** Centre Social "La Plaine", Cachan

Computer Skills

Systems : Linux, MAC OSX, Windows.
Langages : Latex, VBA, Maple, Java, SQL, HTML/CSS.
Applications : Word, Excel/VBA, Access, Maple, Dreamweaver, MySQL, Adobe Photoshop.

Spoken Languages

French : mother tongue
English : fluent
German : fair knowledge
Italian : basic knowledge

2. Teaching Experience

2010-2011	**ATER** *L2 : Advanced java programming. 1 group : 36 hrs.* Université Paris Dauphine *L1 : Java programming. 1 group : 36 hrs.* Université Paris Dauphine *M2 : VBA object model. 1 group : 18 hrs.* Université Paris Dauphine
2009-2010	**Graduate lecturer** *L1 : MAPLE. 2 groups : 100 hrs.* Université Paris Dauphine
2008-2009	**Graduate lecturer** *L3 : Database. un groupe : 50 heures.* Université Paris Dauphine
2007-2008	**Graduate lecturer** *L3 : Scientific management and decision making. 2 groups : 36 hrs.* Université Paris Dauphine *L3 : Supply chain and production management. 2 groups : 36 hrs.* Université Paris Dauphine
Since 2006	**Examiner** *Classe préparatoire HEC : Management and accounting (3 hrs/week)* Ecole Nationale de Commerce - Lycée Bessières

3. Research Experience

Research interests

My research is related to the complexity theory, and is dealing with NPO problems (optimization problems whose decision versions are in NP), and more precisely to polynomial, or moderately exponential approximation. In that sense, I am interested in designing algorithms with bounded approximation ratios, as well as establishing inapproximability bounds and hardness results. In particular, I have discussed various optimization problems in dynamic settings, such as reoptimization, on-line optimization, and probabilistic optimization.

- Reoptimization models situations where an instance already solved optimally experiences local perturbations. The goal is then to make use of the information provided by the optimum on the initial instance to compute a new solution on the perturbed instance with a better approximation ratio and/or running time than if this information was not avalaible.
- On-line optimization models situation where an instance is revealed progressively, and the goal is to maintain a good solution throughout the whole process.
- Probabilistic optimization models situations where the instance that needs to be solved is not perfectly known in advance. Yet, the final instance results from a determined Bernoulli process. In this case, the goal is to determine a solution with optimal *expected value*.

Such settings enable to model different dynamic environments, and to define dynamic optimization problems, which might have different charateristics than their deterministic support. For example, the reoptimization version of MAX INDEPENDENT SET is APX, whereas its deterministic version is not approximable within any constant ratio unless P=NP. On the opposite, a probabilistic version of MIN SPANNING TREE is NP-hard, whereas its deterministic version is known to be polynomial.

My Phd. thesis is focused on the impact of these dynamic settings in terms of complexity and approximability, and contains many new positive and negative results on problems such as MIN SPANNING TREE, MAX INDEPENDENT SET, MAX INDEPENDENT SET or MAX k-COLORABLE INDUCED SUBGRAPH.

Publications and presentations

International Papers

Nicolas Boria, Vangelis Paschos. *Fast reoptimization for the minimum spanning tree problem.* J. Discrete Algorithms, 2010 : 296 310

International Conferences

Nicolas Boria, Cécile Murat, Vangelis Th. Paschos. *On the Probabilistic min spanning tree problem.* IMCSIT 2010 : 893-900. Wisla, Poland

Giorgio Ausiello, Nicolas Boria, Aristotelis Giannakos, Giorgio Lucarelli, Vangelis Th. Paschos. *Online k-coverage* FCT 2011. Oslo, Norway

Presentations

Reoptimization of hereditary problems Doctoral School seminar. December 2010. Université Paris-Dauphine.

Combinatorial optimization and dynamic environments Doctoral School seminar. November 2009. Université Paris Dauphine.

Reoptimization of min and max min spanning tree ROADEF '08. Clermont-Ferrand, France.