

UNIVERSITY OF MILAN

Public selection for recruiting No.1 tenure track researcher(s) (RTT)
for competition sector 01/B1 - INFORMATICA,
(scientific-disciplinary sector INF/01 - INFORMATICA,)
at the Department of Informatica "Giovanni Degli Antoni",

Mauricio Abel Soto Gomez
CURRICULUM VITAE**Personal Information**

Nome	Mauricio Abel
Cognome	Soto Gomez

Qualifications

10/10/2012	Ph.D. in Computer Science. Institute of Fundamental Research in Informatics - IRIF(ex LIAFA), Université Paris Diderot. <i>"On topological properties of graphs and application to communication networks"</i> . Advisors : Laurent Viennot and Fabien de Montgolfier
03/03/2008	M.S. in Computer Science , Parisian Master of Research in Computer Science LIAFA, Université Paris Diderot. <i>"Protocols and algorithms on communication networks"</i> . Advisor : Adi Rosén
16/19/2005	Mathematical Engineering Department of Mathematical Engineering, Universidad de Chile. <i>"Adversarial queueing theory with setups"</i> . Advisor : Marcos Kiwi

Research Contracts

01/02/2023-	RTDa - Università degli Studi di Milano. Department of Computer Science "National Center for Gene Therapy and Drugs based on RNA Technology"
13/01/2020-31/01/2023	RTDa - Politecnico di Milano. Department of Management , Economics and Industrial Engineering. "Machine Learning And Big Data Analytics"
01/06/2019-12/01/2020	Assegno Ricerca - Università degli Studi di Milano-Bicocca. Department of Informatics, Systems and Communication. "On semantic embedding techniques for tabular data reconciliation".
01/03/2018-28/02/2019	Assegno Ricerca - Università degli Studi di Milano-Bicocca. Department of Informatics, Systems and Communication. "Algorithms and tools for linked data profiling".
01/03/2017-28/02/2018	Assegno Ricerca - Università degli Studi di Milano-Bicocca. Department of Informatics, Systems and Communication. "Quality profiles of open data on the Lombardy region".
01/03/2017-30/04/2017	Occasional collaboration - Università degli Studi di Milano-Bicocca. Department of Informatics, Systems and Communication. "Phylogenetic reconstruction for tumoral evolution".

2013 – 2015	Research project manager - Universidad de Chile . Department of Mathematical Engineering. “Graph topological properties and application to communication networks”.
2011 / 2012	Teaching and Research Assistant (Attaché Temporaire d’Enseignement et de Recherche) – full time Université d’Orléans . Graphs, Algorithms and Models of Computation, LIFO.
2010 / 2011	Teaching and Research Assistant – partial time. Université Paris Diderot . LIAFA.

Teaching Experience

Professor

Università degli Studi di Milano

Health Informatics	International Medical School (in english)	Spring 2024	16h
Machine Learning	Master in Human-Centered Artificial Intelligence (in english)	Fall 2023	16h
Health Informatics	International Medical School (in english)	Spring 2023	16h

Politecnico Milano

Optimization	Management and Production Engineering (in italian)	Fall 2022	60h
Optimization	Management and Production Engineering (in italian)	Fall 2021	60h
Optimization	Management and Production Engineering (in italian)	Fall 2020	60h
Optimization	Management and Production Engineering (in italian)	Fall 2019	60h
Optimization	Management and Production Engineering (in italian)	Fall 2018	60h

Università degli Studi di Milano-Bicocca

Optimization	Bachelor in Computer Science (in italian)	Fall 2019	32h
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Universidad de Chile

Multivariate calculus	Bachelor of Sciences in Engineering (in spanish)	Fall 2015	45h
Multivariate calculus	Bachelor of Sciences in Engineering (in spanish)	Summer 2015	45h
Advanced calculus	Bachelor of Sciences in Engineering (in spanish)	Spring 2015	45h
Advanced calculus	Bachelor of Sciences in Engineering (in spanish)	Summer 2015	45h
Optimization	Bachelor of Sciences in Engineering (in spanish)	Spring 2015	45h
Optimization	Bachelor of Sciences in Engineering (in spanish)	Summer 2014	45h
Optimization	Bachelor of Sciences in Engineering (in spanish)	Spring 2014	45h
Optimization	Bachelor of Sciences in Engineering (in spanish)	Fall 2014	45h

Université d’Orléans

Functional programming	Bachelor in Computer Science (in french)	Spring 2012	39h
Maths for Computer Science	Bachelor in Computer Science (in french)	Spring 2012	45h

Graduate School of Management - Politecnico di Milano

Machine Learning	Master in Business Analytics and Data Science (in english)	Spring 2023	12h
Machine Learning	Master in Business Analytics and Data Science (in english)	Spring 2022	25h
Machine Learning	Master in Business Analytics and Data Science (in english)	Spring 2021	30h
Machine Learning	Master in Business Analytics and Data Science (in english)	Spring 2020	18h
Machine Learning	Big Data Analytics (in italian)	Spring 2023	8h
Machine Learning	Big Data Analytics (in italian)	Spring 2022	12h
Machine Learning	Big Data Analytics (in italian)	Spring 2021	12h

Teaching Assistant

Politecnico Milano

Machine Learning	Master of Science, Management (in english)	Fall 2022	20h
Machine Learning	Master of Science, Management (in english)	Fall 2021	20h
Machine Learning	Master of Science, Management (in english)	Fall 2020	20h
Machine Learning	Master of Science, Management (in english)	Fall 2019	20h
Machine Learning	Master of Science, Biotechnology (in english)	Fall 2020	20h
Machine Learning	Master of Science, Biotechnology (in english)	Fall 2019	20h
Optimization	Management and Production Engineering (in italian)	Fall 2022	40h
Optimization	Management and Production Engineering (in italian)	Fall 2021	40h
Optimization	Management and Production Engineering (in italian)	Fall 2020	40h
Optimization	Management and Production Engineering (in italian)	Fall 2019	40h
Optimization	Management and Production Engineering (in italian)	Fall 2018	40h

Università degli Studi di Milano-Bicocca

Optimization	Bachelor in Computer Science (in italian)	Fall 2018	80h
Optimization	Bachelor in Computer Science (in italian)	Fall 2017	40h
Decision Models (tutor)	Master in Computer Science (in english)	Fall 2017	40h

Université d'Orléans

Optimization	Bachelor in Computer Science (in french)	Fall 2011	20h
Informatics tools	Bachelor (in french)	Fall 2011	20h
Programming (Java)	Bachelor (in french)	Fall 2011	45h

Université Paris Diderot

Web Programming	Bachelor in Computer Science (in french)	Spring 2011	52h
Algorithmic	Bachelor in Bioinformatics (in french)	Fall 2011	18h
Programming (Java)	Bachelor (in french)	Fall 2011	29h

Universidad de Chile

Probability	Bachelor of Sciences in Engineering (in spanish)	Summer 2004	30h
Probability	Bachelor of Sciences in Engineering (in spanish)	Spring 2004	30h
Probability	Bachelor of Sciences in Engineering (in spanish)	Fall 2003	30h
Statistics	Bachelor of Sciences in Engineering (in spanish)	Summer 2003	30h
Statistics	Bachelor of Sciences in Engineering (in spanish)	Spring 2003	30h
Advanced Calculus	Bachelor of Sciences in Engineering (in spanish)	Spring 2003	30h
Advanced Calculus	Bachelor of Sciences in Engineering (in spanish)	Spring 2002	30h
Advanced Calculus	Bachelor of Sciences in Engineering (in spanish)	Spring 2001	30h
Multivariate Calculus	Bachelor of Sciences in Engineering (in spanish)	Fall 2004	30h
Multivariate Calculus (MATLAB Lab)	Bachelor of Sciences in Engineering (in spanish)	Fall 2002	10h
Calculus	Bachelor of Sciences in Engineering (in spanish)	Fall 2004	30h
Calculus	Bachelor of Sciences in Engineering (in spanish)	Fall 2003	30h
Calculus	Bachelor of Sciences in Engineering (in spanish)	Fall 2002	30h
Calculus	Bachelor of Sciences in Engineering (in spanish)	Fall 2001	30h
Linear Algebra	Bachelor of Sciences in Engineering (in spanish)	Spring 2002	30h
Linear Algebra	Bachelor of Sciences in Engineering (in spanish)	Fall 2001	30h
Linear Algebra	Bachelor of Sciences in Engineering (in spanish)	Spring 2000	30h

Thesis Supervision

PhD. Thesis

Apr. 2023- Ali Pashaeibarough Department on Informatics. Università degli Studi di Milano

Master Thesis

Mar. 2024- Francisco I. Arrepol Department on Mathematical Engineering. Universidad de Concepción.
2020 Ping An Steven Industrial and Information Engineering. Politecnico di Milano

BCs. Academic Tutor - Politecnico di Milano

2021 Elisa Ferrari, Jacopo Maggioni, Andrea Maniscalchi, Mariapia Malerba
2020 Giacomo Grosa , Paolo Balzardi, Carolina Gervasoni, Alessandro James Carenini, Arcaro Sofia

Founding projects, Scholarships and Awards

Jun 2013 – Jun 2015	Principal Investigator. Research Project Grant. Founded by the “National Commission for Scientific and Technological Development” (CONICYT). (~50000 euro) <i>Project: “Graph topological properties and application to communication networks”.</i>
Feb 2013	Qualification aux fonctions de maître de conférences Section 27 (Computer Science). France.
Sept 2006 – Aug 2009	Master and PhD. Fellowship. Embassy of France – CONICYT University, social security and monthly expenses (France).
1998	Academic excellence grant. Physics and Mathematical Faculty, Universidad de Chile Admission position 6/542. University expenses for the first year (~ 1500 euro).
1998, '99, '00	Faculty excellent academic student. Top 5% of Faculty of Physics and Mathematics, Universidad de Chile.
1997	Silver Medal. Regional Mathematics Olympiad. Universidad de Santiago de Chile. University expenses for the first year (~ 1500 euro).

Research Visiting and Internships

Oct. 2013	Université Paris-Diderot. Institut de Recherche en Informatique Fondamentale Visiting Prof. Fabien de Montgolfier.
Mar. 2015	INRIA, centre at Université Côte d’Azur. Sophia Antipolis, France. Group COATI (Combinatorics, Optimization, and Algorithms for Telecommunications). Visiting Prof. David Coudert.
Jun. 2015	Università degli Studi di Firenze. Dipartimento di Ingegneria dell’Informazione. Visiting Prof. Pierluigi Crescenzi.
Sep 2016-Aug. 2007	Université Paris Sud. Laboratoire de Recherche en Informatique (LRI) Master research internship. Advisor : Adi Rosén
Mar. 2011 - Dec. 2011	Universidad de Chile. Center for Mathematical Modeling (CMM) Research internship. Advisor : Prof. Marcos Kiwi
Mar. 2003 - Dec. 2003	Universidad de Chile. CMM Research internship. Advisor : Prof. Raúl Gormaz

Editorial and Organization Activity

iiWAS 2024	Program committee member. 26th International Conference on Information Integration and Web Intelligence
iiWAS 2023	Program committee member. 25th International Conference on Information Integration and Web Intelligence
Oct. 2024	Review Editor in Computational Genomics. Frontiers Journals.
Feb. 2015	Organizing Committee member. Summer School on Discrete Mathematics. Valparaíso. Chile
Feb. 2014	Organizing Committee member. Summer School on Discrete Mathematics. Valparaíso. Chile

Activity as Reviewer

Journal reviewer: Nature, Theoretical Computer Science, Discrete Applied Mathematics, Computers & Operations Research, Distributed Systems Engineering, Data Mining and Knowledge Discovery. Central European Journal of Mathematics,

Conference/Workshop reviewer: LATIN: Latin American Symposium on Theoretical Informatics, IWOCA: International Workshop on Combinatorial Algorithms, WWW: The Web Conference, WABI: Workshop on Algorithms in Bioinformatics, ICTCS: Italian Conference on Theoretical Computer Science.

PhD. Program evaluator. European Laboratory for Learning and Intelligent Systems (ELLIS)

Publications

Journal Papers

1. Giorgio Valentini, Dario Malchiodi, Jessica Gliozzo, Marco Mesiti, M.S., Alberto Cabri, Justin Reese, Elena Casiraghi, Peter Robinson. **The promises of large language models for protein design and modeling**. *Frontiers in Bioinformatics*, 2023. DOI 10.3389/fbinf.2023.1304099
2. Simone Ciccolella, Gianluca Della Vedova, Vladimir Filipović, Mauricio Soto Gomez. **Three Metaheuristic Approaches for Tumor Phylogeny Inference: An Experimental Comparison**. *Algorithms*, 2023. DOI: 10.3390/a16070333
3. Keith Araño, Carlotta Orsenigo, Mauricio Soto, and Carlo Vercellis. **Multimodal sentiment and emotion recognition in hyperbolic space** *Expert Systems with Applications*, 2021. DOI 10.1016/j.eswa.2021.115507
4. Simone Ciccolella, Camir, Ricketts, Mauricio Soto Gomez, Murray Patterson, Danae, Silverbush, Paola Bonizzoni, Iman Hajirasouliha, Gianluca Della Vedova. **Inferring cancer progression from Single-Cell Sequencing while allowing mutation losses** *Bioinformatics*, 2021. DOI 10.1093/bioinformatics/btaa722
5. Simone Ciccolella, Mauricio Soto Gomez, Murray Patterson, Gianluca Della Vedova, Iman Hajirasouliha, Paola Bonizzoni. **gpps: an ILP-based approach for inferring cancer progression with mutation losses from single cell data**. *BMC Bioinformatics*, 2020. DOI 10.1186/s12859-020-03736-7
6. Paola Bonizzoni, Simone Ciccolella, Gianluca Della Vedova, Mauricio Soto Gomez. **Does Relaxing the Infinite Sites Assumption Give Better Tumor Phylogenies? An ILP-Based Comparative Approach**. *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, 2019. DOI 10.1109/TCBB.2018.2865729
7. David Coudert, Guillaume Ducoffe, Nicolas Nisse and M.S. **On distance-preserving elimination orderings in graphs: complexity and algorithms**. *Discrete Applied Mathematics*, 2018. DOI 10.1016/j.dam.2018.02.007
8. M.S. and Christopher Thraves. **$(p-)$ Box(1): A new graph model**. *Discrete Mathematics and Theoretical Computer Science*, 2015. ISSN 14627264
9. Eduardo G. Pardo, M.S. and Christopher Thraves. **Embedding signed graphs in the line**. *Journal of Combinatorial Optimization*, 2015. DOI 10.1007/s10878-013-9604-1
10. Marcos Kiwi, M.S. and Christopher Thraves. **Adversarial queueing theory with setups**. *Theoretical Computer Science*, 2009. DOI 10.1016/j.tcs.2008.09.064

Conference Papers

11. Emanuele Cavalleri, Sara Bonfitto, Alberto Cabri, Jessica Gliozzo, Paolo Perlasca, Mauricio Soto Gomez, Gabriella Trucco, Elena Casiraghi, Giorgio Valentini, Marco Mesiti. **A Meta-Graph for the Construction of an RNA-Centered Knowledge Graph**. *Bioinformatics and Biomedical Engineering*, 2023. DOI: 10.1007/978-3-031-34953-9_13

12. Paola Bonizzoni, Gianluca Della Vedova, Simone Ciccolella, and M.S. **Beyond Perfect Phylogeny: Multisample Phylogeny Reconstruction via ILP.** In: *Proceedings of the 8th ACM Conference on Bioinformatics, Computational Biology and Health Informatics (AMC-BCB '17)*, Boston, MA, August 2017. DOI 10.1145/3107411.3107441
13. Gianluca Della Vedova, Murray Patterson, Raffaella Rizzi and M.S. **Character-Based Phylogeny Construction and Its Application to Tumor Evolution.** In: *Proceedings of 13th Conference on Computability in Europe (CiE 2017)*, Turku, Finland, June 2017. DOI 10.1007/978-3-319-58741-7_1
14. Manuel Vimercati, Federico Bianchi, M.S. and Matteo Palmonari. **Mapping Lexical Knowledge to Distributed Representations for Ontology Concept Invention.** *8th International Conference of the Italian Association for Artificial Intelligence (AIIA 2019)*, Rende, Italy, November 2019. DOI 10.1007/978-3-030-35166-3_40
15. Federico Bianchi, M.S., Matteo Palmonari and Vincenzo Cutrona. **Type Vector Representations from Text: An Empirical Analysis.** In : *Proceedings of the Workshop on Deep Learning for Knowledge Graphs and Semantic Technologies. 2018.* (DL4KGS18), Crete, Greece, June 2018. ISSN 16130073
16. Laurent Viennot, M.S. and Fabien de Montgolfier. **Asymptotic Modularity of Some Graph Classes.** In: *Proceedings of 22nd International Symposium on Algorithms and Computation (ISAAC 2011)*, Yokohama Japan, December 2011. DOI 10.1007/978-3-642-25591-5_45
17. Laurent Viennot, M.S. and Fabien de Montgolfier. **Treewidth and Hyperbolicity of the Internet.** In: *Proceedings of 10th IEEE International Symposium on Network Computing and Applications (NCA 2011)*, Cambridge, MA, USA, August 2011. DOI 10.1109/NCA.2011.11
18. Laurent Viennot, M.S. and Fabien de Montgolfier. **Modularité asymptotique de quelques classes de graphes.** In: *Actes du 14èmes Rencontres Francophones sur les Aspects Algorithmiques des Télécommunications (AlgoTel 2012)*, La Grande Motte, Hérault, France, May 2012.
19. Laurent Viennot, M.S. and Fabien de Montgolfier. **Clustering de métrique et clustering de graphe.** In: *Actes du 13es Rencontres Francophones sur les Aspects Algorithmiques des Télécommunications (AlgoTel 2011)*, Cap Estérel, France, May 2011.
20. Laurent Viennot, M.S. and Fabien de Montgolfier. **Autour du caractère arborescent d'Internet.** In: *Actes du Majestic 2010*, Bordeaux, France, October 2010.
21. Andrea Maurino, Anisa Rula, Bjørn Marius von Zernichow, M.S., Brian Elvesæter, Dumitru Roman: **Modelling and Linking Company Data in the euBusinessGraph Platform.** In: *Proceedings of the 5th Workshop on Data Science for Macro-modeling with Financial and Economic Datasets (DSMM@SIGMOD 2019)*, Amsterdam, Netherlands, July 2019.

Preprint

22. Akshay Juyal, Zahra Tayebi, Alex Zelikovsky, M.S., Simone Ciccolella, Gianluca Della Vedova and Murray Patterson. **Plastic: An easy to use and modular tool for benchmarking tumor phylogeny reconstruction pipelines.** International Conference on Computational Advances in Bio and Medical Sciences (ICCABS 2023). In press.
23. Jessica Gliozzo, Valentina Guarino, Arturo Bonometti, Alberto Cabri, Emanuele Cavalleri, M.S., Justin Reese, Peter N Robinson, Marco Mesiti, Giorgio Valentini, Elena Casiraghi. **Intrinsic-Dimension analysis for guiding dimensionality reduction and data- fusion in multi-omics data processing.** Submitted to Artificial Intelligence in Medicine. DOI: <https://doi.org/10.1101/2024.01.23.576822>
24. Emanuele Cavalleri, Alberto Cabri, M.S., Sara Bonfitto, Paolo Perlasca, Jessica Gliozzo, Tiffany J. Callahan, Justin Reese, Peter N Robinson, Elena Casiraghi, Giorgio Valentini, and Marco Mesiti. **RNA-KG: An ontology-based knowledge graph for representing interactions involving RNA molecules.** Submitted to Nature Scientific Data. DOI: <https://doi.org/10.48550/arXiv.2312.00183>
25. Andrea Mor, Carlotta Orsenigo, M.S., and Carlo Vercellis. **Shaping the causes of product returns: a topic modeling approach on online customer reviews.** Submitted to Electronic Commerce Research. DOI: 10.2139/ssrn.4329729
26. Enock Niyonkuru, M.S., Elena Casiraghi, Stephan Antogiovanni, Hannah Blau, Justin T Reese, Giorgio Valentini, Peter N Robinson. **Replacing non-biomedical concepts improves embedding of biomedical concepts.** Submitted to Journal of the American Medical Informatics Association.

27. Emanuele Cavalleri , M.S. , Ali Pashaeibarough, Dario Malchiodi, Harry Caufield, Justin Reese, Christopher J. Mungall, Peter N. Robinson, Elena Casiraghi, Giorgio Valentini and Marco Mesiti. **Relation extraction from RNA-focused scientific papers through SPIREX**. Submitted to International Workshop on LLM at VLDB 2024.