

Igor Melatti

Curriculum Vitae

Department of Information Engineering, Computer Science and Mathematics
University of L'Aquila

2023/04/04

Part I - General Information

Full Name	Igor Melatti
Citizenship	Italian
Spoken Languages	Italian, English
Current Position	Professore Associato INF/01

Part II - Education

Type	Year	Institution	Notes
University graduation	2001	Univ. of L'Aquila	Degree in Computer Science with maximum score and <i>laude</i>
PhD	2005	Univ. of L'Aquila	PhD in Computer Science and Applications

Part III - Academic Appointments

Dates are in YYYY/MM/DD format.

Start	End	Institution	Position
2005/07/11	2005/12/31	Univ. of Utah (USA)	Post Doctoral Research Associate
2006/07/15	2006/09/15	Univ. of Utah (USA)	Post Doctoral Research Associate
2006/02/01	2010/01/31	Sapienza Univ. of Rome	Post-Doc
2010/05/01	2010/12/29	Sapienza Univ. of Rome	Post-Doc
2010/12/31	2020/03/01	Sapienza Univ. of Rome	Assistant Professor (Researcher)
2020/03/02	2022/10/31	Sapienza Univ. of Rome	Associate Professor
2022/11/01	Ongoing	Univ. of L'Aquila	Associate Professor

Part IV - Teaching Experience

In the Academic Year 2022/2023, Igor Melatti is responsible for the following courses of the University of L'Aquila:

- “Software Testing and Validation”, Bachelor Degree in Computer Science, all 6 CFUs;
- “Automated Verification of Cyber-Physical Systems”, Master Degree in Computer Science, all 6 CFUs;
- “Computer Science for Companies” (“Informatica per le Aziende”), Bachelor Degree in Corporate Lawyer (Laurea in “Operatore Giuridico d’Impresa”), 4 out of 9 CFUs;

Igor Melatti was responsible for the following courses of the Sapienza University of Rome:

- “Computer Science” (“Informatica”), Bachelor Degree in Statistics, Economics, Finance, Insurances (Laurea in “Statistica, Economia, Finanza ed Assicurazioni”), from 2011 to 2014, all 9 CFUs;
- “Web Programming”, Bachelor Degree in Computer Science, from 2014 to 2017, all 6 CFUs;
- “Operating Systems 1st Module”, Bachelor Degree in Computer Science, from 2017 to 2022, all 6 CFUs;
- “Operating Systems 2nd Module”, Bachelor Degree in Computer Science, from 2015 to 2022, all 6 CFUs;
- “Formal Methods in Software Development”, Master Degree in Computer Science, from 2019 to 2022, 3 out of 6 CFUs.

IVb – Fully Organized e-Learning Courses

Igor Melatti has recorded all lessons inside the following e-learning courses of the Unitelma University:

- “Web Programming”, Bachelor Degree in Computer Science;
- “Operating Systems 1st Module”, Bachelor Degree in Computer Science.

Igor Melatti has been the tutor for the following e-learning courses, which also entailed organizing web-seminars for students.

- “Web Programming”, Bachelor Degree in Computer Science, A.Y. 2016/2017;
- “Operating Systems 1st Module”, Bachelor Degree in Computer Science, from 2015 to 2022.
- “Operating Systems 2nd Module”, Bachelor Degree in Computer Science, from 2016 to 2022.

IVe – PhD Programs

Igor Melatti is a member of the Advisors Committee of the PhD School of the Sapienza University of Rome Department of Computer Science from January 2011 to November 2022. Inside such PhD School he:

- has served twice as member of the committee for the admission to the PhD School (2015 and 2017);
- has been part of 2 PhD student committees.

IVf – Bachelor Theses

Igor Melatti has been the advisor of around 40 bachelor students of the Computer Science Bachelor Course of Sapienza University of Rome.

He was also the advisor of 2 students for the Honour Programme for Bachelor Programme in Computer Science (Percorso di eccellenza per laurea triennale in Informatica).

IVg – Teaching Administrative Roles

Igor Melatti has the following teaching administrative roles inside the Department of Computer Science of Sapienza University of Rome.

Start	End	Role
2011	2022	Member of the Activities Outside University Committee (Commissione Attività ExtraUniversitarie)
2015	2022	Member of the Teaching Committee (Commissione Didattica di Dipartimento)
2018	2022	Member of the Final Exams Committee (Commissione Prova Finale)
2018	2022	Responsible, for the courses of the Department of Computer Science, of all curricular and extra-curricular internships inside national and foreign companies and research centers (Delegato del Preside della Facoltà di Ingegneria dell’Informazione, Informatica e Statistica per la piattaforma JobSoul)

Part V - Society Memberships, Awards and Honors

Year	Title
2018	Winner of a FFABR (Fondo di finanziamento individuale per le attività base di ricerca)
2018	Best paper award at ISMIS 2018
2003	Best paper award at CHARME 2003

Part VI - Funding Information

Igor Melatti was responsible of work packages inside the following projects.

Year	Title	Program	Value	Role
2020-2022	POR FESR 2014-2020 “SDFS - Satellite Driven Fire Simulator”	Lazio Innova	73.6 k€ (unit), 250 k€ (total)	Investigator (WP leader); member of the co-ordinator unit
2018-2019	POR FESR 2014-2020 “SCAPR - Sistema per il Contrasto di Aeromobili a Pilotaggio Remoto”	Lazio Innova	95.2 k€ (unit), 340 k€ (total)	Investigator (WP leader); member of the co-ordinator unit
2013-2016	SmartHG: Energy Demand-Aware Open Services for Smart Grid Intelligent Automation	European Commission FP7	600 k€ (unit), 3.3 M€ (total)	Investigator (WP leader); member of the co-ordinator unit
2013-2016	PAEON: Model Driven Computation of Treatments for Infertility Related Endocrinological Diseases	European Commission FP7	620 k€ (unit), 2.4 M€ (total)	Investigator (WP leader); member of the co-ordinator unit
2009-2011	ULISSE: USOCs KnowLedge Integration and Dissemination for Space Science Experimentation	European Commission FP7	238 k€ (unit), 4.8 M€ (total)	Investigator (WP leader)

Part VII - Research Activities

VIIa - Research Topics

Keyword	Brief Description
Model Checking	To design algorithm, tools and models for the automatic verification of complex software-based systems
Controller Synthesis	To design algorithm, tools and models for the automatic synthesis of controllers, i.e., correct-by-design reactive programs able to drive a system from any state to a goal state
Services for Smart Grids	To design and implement intelligent services for smart grids, both on the utilities and on the consumers side
Services for Medicine	To design and implement intelligent services for medicine (e.g., algorithms able to automatically instantiate generic medical treatments)

VIIb - Service

He was in the Organizing Committee of the following conferences: CHARME 2003, ETAPS 2013.

He was in the program committee of the SPIN 2015, i.e., the 22nd International SPIN Symposium on Model Checking of Software.

He serves/has served as a reviewer for the following journals:

- Applied Energy (Elsevier)
- IEEE Distributed Systems Online
- International Journal of Parallel Programming (Springer)
- Formal Methods in System Design (Springer)
- Automatica (Elsevier)
- Journal of Logical and Algebraic Methods in Programming (Elsevier)
- International Journal of Business Data Communications and Networking (IGI Global)

He has served as a reviewer for the following conferences:

- HSCC - ACM International Conference on Hybrid Systems: Computation and Control: 2017
- DSD - Euromicro Conference on Digital System Design: 2015
- SPIN - International SPIN Symposium on Model Checking of Software: 2015
- TMS/DEVS - Symposium on Theory of Modeling and Simulation: 2014
- CONCUR - International Conference on Concurrency Theory: 2014
- Gandalf - International Symposium on Games, Automata, Logics, and Formal Verification: 2014, 2015
- ICSEA - International Conference on Software Engineering Advances: 2012, 2013, 2014
- PSI - Ershov Informatics Conference: 2011
- ICALP - International Colloquium on Automata, Languages and Programming: 2011
- CAV - International Conference on Computer-Aided Verification: 2010
- SAT - International Conference on Theory and Applications of Satisfiability Testing: 2009
- LICS - ACM/IEEE Symposium on Logic in Computer Science: 2006
- CHARME - Advanced Research Working Conference on Correct Hardware Design and Verification Methods: 2003

VIIb - Research Software

As part of his research, Igor Melatti was the main developer of the following research software:

- QKS (*Quantized Kontrol Synthesizer*, a preliminary version is available at http://mclab.di.uniroma1.it/software_qks.html) implements algorithms for automatic synthesis of control software for discrete time hybrid systems.

- NashMV (a preliminary version is available at <http://mclab.di.uniroma1.it/software.html#nashmv>). NashMV is able to check if Multiple Administrative Domain protocols are Nash Equilibria, by properly modifying the NuSMV model checker.
- Parallel Murphi (Eddy_Murphi, available at http://www.cs.utah.edu/formal_verification/software/murphi/eddy_murphi/). Eddy_Murphi is a parallel version (i.e., it runs on *computer clusters*) of the model checker Murphi.
- Finite Horizon Probabilistic Murphi (CMurphi 5.4.6, available at <http://mclab.di.uniroma1.it/software.html#cmurphi>). FHP-Murphi (Finite Horizon Probabilistic Murphi) is a model checker able to verify finite horizon probabilistic properties of discrete time stochastic processes.

Part VIII – Summary of Scientific Achievements

Product Type	Number	Database	Start	End
Article	25	Scopus	2003	2021
Conference proceedings	35	Scopus	2003	2021
Total	60	Scopus	2003	2021
Total citations	705	Scopus	2003	2021
Average citations per product	11.75	Scopus	2003	2021
Hirsch (H) index	17	Scopus	2003	2021
Normalized Hirsch (H) index	0.9	Scopus	2003	2021

The following table shows Igor Melatti's achievements with respect to the National Scientific Qualification requirements (2021-2023), as from the Sapienza IRIS Catalog.

Habilitation Type	Indicator	Value	Threshold	Result
I fascia	1	15	9	PASS
I fascia	2	619	304	PASS
I fascia	3	16	10	PASS
I fascia	overall			PASS
commissario	1	15	11	PASS
commissario	2	619	391	PASS
commissario	3	16	11	PASS
commissario	overall			PASS

Part IX – Selected Publications

For the complete list of publications, see <https://dblp.org/pid/40/4422.html>.

1. I. Melatti, F. Mari, T. Mancini, M. Prodanovic, and E. Tronci “A Two-Layer Near-Optimal Strategy for Substation Constraint Management via Home Batteries” In IEEE Transactions on Industrial Electronics, 48(10), 2022, pp. 4002-4013
2. I. Melatti, T. Mancini, and E. Tronci “Any-horizon uniform random sampling and enumeration of constrained scenarios for simulation-based formal verification” In IEEE Transactions on Software engineering, 69(8), pp. 8566-8578
3. T. Mancini, F. Mari, I. Melatti, I. Salvo, and E. Tronci. “An efficient algorithm for network vulnerability analysis under malicious attacks” In Foundations of Intelligent Systems – Proc. of ISMIS 2018, pp. 302–312, 2018. Notes: Best Paper
4. T. Mancini, F. Mari, I. Melatti, I. Salvo, and E. Tronci. “An efficient algorithm for network vulnerability analysis under malicious attacks” In Foundations of Intelligent Systems – Proc. of ISMIS 2018, pp. 302–312, 2018. Notes: Best Paper
5. V. Alinguzhin, F. Mari, I. Melatti, I. Salvo, and E. Tronci. “Linearising Discrete Time Hybrid Systems.” IEEE Transactions on Automatic Control 62(10), 2017, pp. 5357–5364.
6. T. Mancini, F. Mari, A. Massini, I. Melatti, I. Salvo, and E. Tronci. “On minimising the maximum expected verification time” Information Processing Letters, Vol. 122, June 2017, pp. 8–16
7. B. P. Hayes, I. Melatti, T. Mancini, M. Prodanovic, and E. Tronci. “Residential demand management using individualized demand aware price policies” IEEE Transactions On Smart Grid 8(3), 2017, pp. 1284–1294
8. T. Mancini, F. Mari, A. Massini, I. Melatti, and E. Tronci. “Anytime system level verification via parallel random exhaustive hardware in the loop simulation.” Microprocessors and Microsystems 41, 2016, pp. 12–28.
9. T. Mancini, F. Mari, A. Massini, I. Melatti, and E. Tronci. “SyLVaaS: System Level Formal Verification as a Service.” Fundamenta Informaticae 149(1-2), 2016, pp. 101–132
10. V. Alinguzhin, F. Mari, I. Melatti, E. Tronci, E. Ebeid, S. A. Mikkelsen, R. H. Jacobsen, J. K. Gruber, B. Hayes, F. Huerta, and M. Prodanovic. “A Glimpse of SmartHG Project Test-bed and Communication Infrastructure.” In Proc. of DSD 2015, pp. 225–232

11. T. Mancini, E. Tronci, I. Salvo, F. Mari, A. Massini, and I. Melatti. "Computing Biological Model Parameters by Parallel Statistical Model Checking." Proc. of IWBBIO 2015, 2015, pp. 542–554
12. E. Tronci, T. Mancini, F. Mari, I. Melatti, I. Salvo, M. Prodanovic, J. K. Gruber, B. Hayes, and L. Elmegaard. "Demand-Aware Price Policy Synthesis and Verification Services for Smart Grids." In Proc. of SmartGridComm 2014
13. F. Mari, I. Melatti, I. Salvo, and E. Tronci. "Model Based Synthesis of Control Software from System Level Formal Specifications." ACM Transactions On Software Engineering and Methodology 23(1), 2014, pp. 6:1–6:42
14. Toni Mancini, Federico Mari, Annalisa Massini, Igor Melatti, and Enrico Tronci. "System Level Formal Verification via Distributed Multi-Core Hardware in the Loop Simulation." In Proc. of Parallel, Distributed and Network-Based Processing 2014, pp. 734–742
15. E. Tronci, T. Mancini, I. Salvo, S. Sinisi, F. Mari, I. Melatti, A. Massini, F. Davì, T. Dierkes, R. Ehrig, S. Röblitz, B. Leeners, T. H. C. Krüger, M. Egli, F. Ille. "Patient-Specific Models from Inter-Patient Biological Models and Clinical Records." In Proc. FMCAD 2014, pp. 207–214