Yuriy Zacchia Lun, Ph.D.

Curriculum Vitae et Studiorum

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🎓 Education

2017   **Ph.D. Comput. sci., Gran Sasso Science Institute (GSSI) / IMT Lucca (joint program)**.
Diss. title: *Stability and optimal control of polytopic time-inhomogeneous Markov jump linear systems.*
Advisors: Prof. Maria Domenica Di Benedetto and Prof. Alessandro D'Innocenzo.

2012   **M.Sc. Telecom. Eng., University of L'Aquila**. Final score: 110/110.
Diss. title: *Algorithm for refinement of telecommunication network infrastructure localization.*

2008   **B.Sc. Telecom. Eng., University of L'Aquila**. Final score: 110/110.

💼 Employment History

Since 2022   **Assistant professor (non-tenure track: RTDa)**, Department of Information Engineering, Computer Science and Mathematics (DISIM), University of L'Aquila.

2018–2022   **Research collaborator**, SysMA research unit, IMT School for Advanced Studies Lucca.
Projects: Industrial cybersecurity—SINCERA; Cyber range scenario design and management; Methodologies and tools for data network security.

2017–2018   **Research collaborator**, University of L'Aquila and Center of Excellence DEWS.
Project: Formal verification for security in cyber-physical systems.

2013   Industrial R&D **Assistant Researcher**, WEST Aquila S.r.l.

2012–2013   ICT Training **Analyst**, CONSEL—ELIS Consortium.
Activities: Design of the vocational master on "Development of applications and services in the cloud" and teaching of the "Administration of salesforce.com" course.

🏛 Visiting Positions

2017/02–2017/07   **Visiting Ph.D. student** within ERASMUS+ for Traineeship programme, OXCAV group, Department of Computer Science, University of Oxford.

🏅 Awards

2019   **Best work in progress paper award**, 15th **IEEE** International Workshop on Factory Communication Systems (**WFCS**).

🛠 Skills

Languages   Strong reading, writing and speaking competencies for English, Italian, and Russian.

Coding   Strong proficiency with MATLAB and LaTeX.

📇 Professional Associations

IEEE   **Member** since 2016.

ACM   **Member** since 2024.

🖥 Teaching at the University of L'Aquila (UnivAQ)

Since 2023	🔖 ICT Security—F4Z, I4W, and I3N—6 ECTS credits. Principal lecturer: Dr. Walter Tiberti. Activities: 32 hours of lessons (4 ECTS credits).
Since 2022	🔖 *Complementi di analisi dei segnali e campi elettromagnetici* (Complements of signal analysis and electromagnetic fields, conducted in Italian)—I3D—3 ECTS credits. Activities: 15 hours of lessons and exercises (3 ECTS credits).
	🔖 Industrial communications—I4S—9 ECTS credits. Principal lecturer: Prof. Piergiuseppe Di Marco. Activities: 30 hours of lessons (3 ECTS credits).
2023–2024	🔖 *Metodologie e strumenti per l'insegnamento di tecnologie e sistemi di telecomunicazioni* (Methodologies and tools for teaching telecommunications technology and systems, conducted in Italian)—University pathways for initial training of secondary school teachers: the A-40 Class—Electrical and electronic science and technology—1 ECTS credit. Activities: 6 hours of lessons (1 ECTS credit).
	🔖 *Laboratorio di didattica di segnali, trasmissioni e reti* (Signals, transmission, and networks teaching laboratory, conducted in Italian)—University pathways for initial training of secondary school teachers: the A-40 Class—Electrical and electronic science and technology—1 ECTS credit. Activities: 12 hours of laboratory experiences (1 ECTS credit).
2021–2022	🔖 *Analisi dei segnali e campi elettromagnetici* (Signals analysis and electromagnetic fields, conducted in Italian)—I3D—9 ECTS credits. Principal lecturer: Prof. Fortunato Santucci. Activities: 20 hours of lessons (2 ECTS credits) within the Signals analysis course unit.

◆ Research Interests

🔖 Automatic control of wireless networked control systems; communication, computation, and control co-design; stochastic hybrid systems, formal methods, and security in cyber-physical domains.

📖 Research Publications

Journal Articles

7 **Zacchia Lun**, Y., Smarra, F., & D'Innocenzo, A. (2025). Optimal control over Markovian wireless communication channels under generalized packet dropout compensation. *Automatica*, *176*, 112240. 🔗 doi:10.1016/j.automatica.2025.112240

6 **Zacchia Lun**, Y., Santucci, F., & D'Innocenzo, A. (2024). Robust linear quadratic regulation over polytopic time-inhomogeneous Markovian channels under generalized packet dropout compensation. *IEEE Control Systems Letters*, *8*, 3315–3320. 🔗 doi:10.1109/LCSYS.2024.3521656

5 **Zacchia Lun**, Y., Rinaldi, C., D'Innocenzo, A., & Santucci, F. (2024). Co-designing wireless networked control systems on IEEE 802.15.4-based links under Wi-Fi interference. *IEEE Access*, *12*, 71157–71183. 🔗 doi:10.1109/ACCESS.2024.3402082

4 Impicciatore, A., **Zacchia Lun**, Y., Pepe, P., & D'Innocenzo, A. (2024). Optimal output-feedback control over Markov wireless communication channels. *IEEE Transactions on Automatic Control*, *69*(3), 1643–1658. 🔗 doi:10.1109/TAC.2023.3328268

3 Soderi, S., Masti, D., & **Zacchia Lun**, Y. (2023). Railway cyber-security in the era of interconnected systems: A survey. *IEEE Transactions on Intelligent Transportation Systems*, *24*(7), 6764–6779. 🔗 doi:10.1109/TITS.2023.3254442

2 **Zacchia Lun**, Y., D'Innocenzo, A., & Di Benedetto, M. D. (2019). Robust stability of polytopic time-inhomogeneous Markov jump linear systems. *Automatica*, *105*, 286–297. 🔗 doi:10.1016/j.automatica.2019.03.031

1   **Zacchia Lun**, Y., D'Innocenzo, A., Smarra, F., Malavolta, I., & Di Benedetto, M. D. (2019). State of the art of cyber-physical systems security: An automatic control perspective. *Journal of Systems and Software, 149*, 174–216. 🔗 doi:10.1016/j.jss.2018.12.006

Conference Proceedings

16   Khan, M. A., **Zacchia Lun**, Y., Di Marco, P., Mahmood, A., Santucci, F., & Gidlund, M. (2025, June). Analysis of communication and control performance of multi-hop IEEE 802.15.4-based WNCSs under Wi-Fi interference. In *Proceedings of the 21st International IEEE Conference on Factory Communication Systems (WFCS).* Accepted. IEEE.

15   **Zacchia Lun**, Y., Rinaldi, C., Santucci, F., & D'Innocenzo, A. (2023, July). Wireless networked control over lossy uplinks abstracted by finite-state Markov channels. In *Proceedings of the 22nd IFAC World Congress: IFAC-PapersOnLine (56) 2* (pp. 3041–3047). Elsevier. 🔗 doi:10.1016/j.ifacol.2023.10.1432

14   Impicciatore, A., Tsiamis, A., **Zacchia Lun**, Y., D'Innocenzo, A., & Pappas, G. J. (2022, December). Secure state estimation over Markov wireless communication channels. In *Proceedings of the 61st IEEE Conference on Decision and Control (CDC)* (pp. 2935–2940). IEEE. 🔗 doi:10.1109/CDC51059.2022.9992668

13   Florenzan Reyes, L. F., Smarra, F., **Zacchia Lun**, Y., & D'Innocenzo, A. (2021, June). Learning Markov models of fading channels in wireless control networks: a regression trees based approach. In *Proceedings of the 29th Mediterranean Conference on Control and Automation (MED)* (pp. 232–237). IEEE. 🔗 doi:10.1109/MED51440.2021.9480310

12   Impicciatore, A., **Zacchia Lun**, Y., Pepe, P., & D'Innocenzo, A. (2021, May). Optimal output-feedback control and separation principle for Markov jump linear systems modeling wireless networked control scenarios. In *Proceedings of the 2021 American Control Conference (ACC)* (pp. 2700–2706). IEEE. 🔗 doi:10.23919/ACC50511.2021.9482674

11   **Zacchia Lun**, Y., Rinaldi, C., Alrish, A., D'Innocenzo, A., & Santucci, F. (2020, July). On the impact of accurate radio link modeling on the performance of WirelessHART control networks. In *Proceedings of the 2020 IEEE Conference on Computer Communications (INFOCOM)* (pp. 2430–2439). IEEE. 🔗 doi:10.1109/INFOCOM41043.2020.9155285

10   **Zacchia Lun**, Y., & D'Innocenzo, A. (2019, December). Stabilizability of Markov jump linear systems modeling wireless networked control scenarios. In *Proceedings of the 58th IEEE Conference on Decision and Control (CDC)* (pp. 5766–5772). IEEE. 🔗 doi:10.1109/CDC40024.2019.9029202

9   **Zacchia Lun**, Y., Abate, A., & D'Innocenzo, A. (2019, June). Linear quadratic regulation of polytopic time-inhomogeneous Markov jump linear systems. In *Proceedings of the 17th European Control Conference (ECC)* (pp. 4094–4099). IEEE. 🔗 doi:10.23919/ECC.2019.8796279

8   Alrish, A., **Zacchia Lun**, Y., D'Innocenzo, A., & Santucci, F. (2019, May). Work in Progress: Systematic Derivation of Accurate Analytic Markov Channel Models for Industrial Control. In *Proceedings of the 15th IEEE International Workshop on Factory Communication Systems (WFCS)* (pp. 1–4). IEEE. 🔗 doi:10.1109/WFCS.2019.8757917

7   **Zacchia Lun**, Y., Wheatley, J., D'Innocenzo, A., & Abate, A. (2018, July). Approximate abstractions of Markov chains with interval decision processes. In *Proceedings of the 6th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS): IFAC-PapersOnLine (51) 16* (pp. 91–96). Elsevier. 🔗 doi:10.1016/j.ifacol.2018.08.016

6   **Zacchia Lun**, Y., D'Innocenzo, A., Abate, A., & Di Benedetto, M. D. (2017, December). Optimal robust control and a separation principle for polytopic time-inhomogeneous Markov jump linear systems. In *Proceedings of the 56th IEEE Conference on Decision and Control (CDC)* (pp. 6525–6530). IEEE. 🔗 doi:10.1109/CDC.2017.8264642

(5) **Zacchia Lun**, Y., D'Innocenzo, A., & Di Benedetto, M. D. (2017a, July). Robust LQR for time-inhomogeneous Markov jump switched linear systems. In *Proceedings of the 20th IFAC World Congress: IFAC-PapersOnLine (50) 1* (pp. 2199–2204). Elsevier. 🔗 doi:10.1016/j.ifacol.2017.08.281

(4) **Zacchia Lun**, Y., D'Innocenzo, A., & Di Benedetto, M. D. (2017b, July). Robust stability of time-inhomogeneous Markov jump linear systems. In *Proceedings of the 20th IFAC World Congress: IFAC-PapersOnLine (50) 1* (pp. 3418–3423). Elsevier. 🔗 doi:10.1016/j.ifacol.2017.08.838

(3) **Zacchia Lun**, Y., D'Innocenzo, A., & Di Benedetto, M. D. (2016, December). On stability of time-inhomogeneous Markov jump linear systems. In *Proceedings of the 55th IEEE Conference on Decision and Control (CDC)* (pp. 5527–5532). IEEE. 🔗 doi:10.1109/CDC.2016.7799118

(2) **Zacchia Lun**, Y., Tennina, S., Di Renzo, M., Graziosi, F., & Verikoukist, C. (2013, November). WSN-Aided People Localization: A Ray Tracing Network Planning and Performance Analysis Tool. In *Proceedings of the 11th ACM Conference on Embedded Networked Sensor Systems (SenSys)* (Article 36). ACM. 🔗 doi:10.1145/2517351.2517406

(1) Tennina, S., Kartsakli, E., Lalos, A., Antonopoulos, A., Mekikis, P.-V., Di Renzo, M., … Verikoukis, C. (2013, October). WSN4QoL: Wireless Sensor Networks for quality of life. In *Proceedings of the 15th IEEE International Conference on e-Health Networking, Applications and Services (HealthCom)* (pp. 277–279). IEEE. 🔗 doi:10.1109/HealthCom.2013.6720683

🎤 Selected Talks at Conferences and Seminars

2023/07/11 🔖 Speaker at the 22nd IFAC World Congress—Yokohama, Japan—presenting the conference paper [C15] above

2020/07/09 🔖 Speaker at the 2020 IEEE Conference on Computer Communications (INFOCOM)—Virtual due to the COVID-19 pandemic—presenting the conference paper [C11] above

2019/12/13 🔖 Speaker at the 58th IEEE Conference on Decision and Control (CDC)—Nice, France—presenting the conference paper [C10] above

2019/06/28 🔖 Speaker at the 17th European Control Conference (ECC)—Naples, Italy—presenting the conference paper [C9] above

2019/04/17 🔖 Speaker at the Cyberspace and cybersecurity seminar (organized by the Chamber of Commerce of Lucca, conducted in Italian under the title *Cyber spazio e Cyber security*)—Lucca, Italy—giving a talk on cloud platforms for ICT security monitoring with an Italian title *"Le piattaforme CLOUD per il monitoraggio della sicurezza ICT"*

2018/07/11 🔖 Speaker at the 6th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS)—Oxford, OX, UK—presenting the conference paper [C7] above

2017/12/15 🔖 Speaker at the 56th IEEE Conference on Decision and Control (CDC)—Melbourne, VIC, Australia—presenting the conference paper [C6] above

2017/09/12 🔖 Speaker at the 2017 Automatica.it Conference—Milan, Italy—presenting the research outcomes under the title "Stability and optimal control of polytopic time-inhomogeneous Markov jump linear systems"

2017/07/10 🔖 Speaker at the 20th IFAC World Congress—Toulouse, France—presenting the conference papers [C4] and [C5] above

2016/12/14 🔖 Speaker at the 55th IEEE Conference on Decision and Control (CDC)—Las Vegas, NV, USA—presenting the conference paper [C3] above

2013/11/11 🔖 Speaker at the 11th ACM Conference on Embedded Networked Sensor Systems (SenSys)—Rome, Italy—presenting the poster [C2] above

⭐ Editorial and Reviewing Activities

2024–present	🔖 **Associate editor** for the European Control Conference (ECC' 25)
2015–present	🔖 Technical **reviewer** for several international journals and conferences, including ACM TCPS, Elsevier Automatica, Nonlinear Analysis: Hybrid Syst., and Eur. J. Control, IEEE TAC, L-CSS, T-ITS, TVT, JSAC, COMML, ICC, GLOBECOM, ICMLCN, and CDC.
2019	🔖 Co-chair of a regular session at the 18th European Control Conference (FrC5: Sliding and Switched Control).
2017	🔖 Co-chair of a regular session at the 56th IEEE Conference on Decision and Control (FrC11: Switched Systems III; in lieu of Prof. Patrizio Colaneri).
	🔖 Co-chair of a regular session at the 20th IFAC World Congress (MoP24: Stability and Stabilization of Hybrid Systems).
2016	🔖 Co-chair of a regular session at the 55th IEEE Conference on Decision and Control (WeA12: Stability of Hybrid Systems; in lieu of Prof. Alessandro D'Innocenzo).

🗂 Projects

2024–present	🔖 **HD-MOTION**—Hub for the Digital MObility TransformatION—European Digital Innovation Hubs Network project 🌐 https://hdmotion.eu Position: **Scientific committee member** and **coordinator** for the UnivAQ
2023–present	🔖 **Resilient Trust**—Trusted SMEs for Sustainable Growth of Europeans Economical Backbone to Strengthen the Digital Sovereignty—Horizon Europe Grant 101112282 Position: **Researcher** and **task leader** coordinating the development of machine-learning-based radio frequency anomaly and malicious attack detection mechanisms
	🔖 **DigInTraCE**—A Digital value chain Integration Traceability framework for process industries for Circularity and low Emissions by waste reduction and use of secondary raw materials—Horizon Europe Grant 101091801 🌐 https://www.digintrace.eu Position: **Researcher**

L'Aquila, March 20, 2025   Yuriy Zacchia Lun