

# Esteban Municio

## Telecommunications Engineer and PhD in Computer Science

More on: <https://emunicio.github.io/>

Barcelona 08034 Spain

esteban.municio@i2cat.net

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### SUMMARY

- Telecommunications Engineer and PhD in Computer Science specialized in programmable networks and Industrial IoT.
  - In-depth knowledge on wired and wireless networks, with focus on the PHY, MAC and IP layers.
  - Hands-on experience in multi-domain testbeds and on-field network deployments.
  - Wide background and research experience in ultra-reliable IoT networks, Open RAN and end-to-end traffic engineering through, SDN, network orchestration, TSN and network slicing techniques.
  - Experience in ICT4D and international development cooperation projects. Interested in connectivity provision in rural and isolated environments.
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### Education

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| 2015 – 2020 | <b>Ph.D. in Computer Science</b><br>at Faculty of Science – Universiteit Antwerpen (UAntwerpen)<br>Thesis: <i>Towards Scalable End-to-End Programmable Industrial Internet of Things</i>  |
| 2013 – 2014 | <b>M.Sc. in Networks and Computer Systems</b><br>at School of Telecommunications Engineering (ETSIT), Universidad Rey Juan Carlos (URJC) - 60 ECTS<br>Thesis: <i>Heterogeneous wireless backhaul networks for rural 3G femtocells in developing countries.</i>  |
| 2009 – 2013 | <b>University-specific degree in Development Cooperation</b><br>at School of Agricultural Engineering (ETSIA), Universidad Politécnica de Madrid (UPM) - 41 ECTS  |
| 2010 – 2013 | <b>M.Sc. in Telecommunications Engineering</b><br>at School of Telecommunications Engineering (ETSIT), Universidad Politécnica de Madrid (UPM) - 120 ECTS<br>Thesis: <i>Study and implementation of routing protocols for wireless mesh networks in rural environments.</i><br>Grade: A with Honours - Percentile: 99.9 % |
| 2006 – 2010 | <b>B.Sc. in Telecommunications Engineering</b><br>at Technical University School (EUITT), Universidad Politécnica de Madrid (UPM) - Telematics - 240 ECTS   |

### Other Courses:

Feb 2015 - “Introduction to 3GPP Small Cell Systems & NC200 Operation”, at *IP Access*. 96h. Cambridge (United Kingdom)  
Mar 2009 - “Scientific Programming in C++”, at *Katholieke Universiteit Leuven* (KUL) 40h. Leuven (Belgium)  
Sep 2008 - “Computational Steering in Science and Engineering” at *Technische Universität München* (TUM) 40h Munich (Germany)  
Feb 2013 - “Cisco CCNA Certification” at *Av@anza*. 30h Madrid (Spain)

### Experience

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| Jan 2022 – ongoing  | <b>Senior Researcher</b> at i2CAT – AI-Driven Systems<br>Open Radio Access Networks and 5G (Spain)  |
| Nov 2019 – Dec 2021 | <b>Postdoc Researcher</b> at IDLab Antwerp, <i>University of Antwerp – imec</i><br>End-to-end programmable networks and Industrial IoT (Belgium)  |
| May 2015 - Nov 2019 | <b>PhD Researcher</b> at IDLab Antwerp, <i>University of Antwerp – imec</i><br>Scalable End-to-End Programmable Industrial Internet of Things (Belgium)   |
| Mar 2013 - May 2015 | <b>Research Assistant</b> at TSC, <i>King Juan Carlos University</i><br>In EU-FP7 TUCAN3G project: “Wireless technologies for isolated rural communities in developing countries based on cellular 3G/4G femtocell deployments” (Spain) |
| Jun 2012 - Mar 2013 | <b>Research internship</b> at INICTEL-UNI, <i>National University of Engineering</i><br>Deployment of wireless mesh networks in a high-Andean rural ecosystem and teaching workshops at INICTEL-UNI (Peru)                              |

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## TEACHING

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2023-2024: Adjunct Professor “5G and Wireless Networking”, *Master in Connected Industry 4.0, Universidad Carlos III Madrid* (3 ECTS)  
2016-2017: Lab Teaching Assistant “Computer and Network Security”, *Master of Computer Science, University of Antwerp* - (6 ECTS)  
2017-2018: Lab Teaching Assistant “Computer and Network Security”, *Master of Computer Science, University of Antwerp* - (6 ECTS)  
Oct 2012: Lab Teaching assistant “1<sup>st</sup> Workshop of rural Telecommunications”, INICTEL-UNI, National University of Engineering

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## TOP PUBLICATIONS

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**Municio, E.**, G. Garcia-Aviles, A. Garcia-Saavedra and X. Costa-Pérez, "O-RAN: Analysis of Latency-Critical Interfaces and Overview of Time Sensitive Networking Solutions," in *IEEE Communications Standards Magazine*, vol. 7, no. 3, pp. 82-89, September 2023 [IF: N/A]

**Municio, E.**, Cevik, M., Ruth, P., & Marquez-Barja, J. M. (2021, May). Achieving End-to-End Connectivity in Global Multi-Domain Networks. In *IEEE INFOCOM 2021-IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS)* (pp. 1-6) [IF: N/A]

**Municio, E.**, Latre, S., & Marquez-Barja, J. M. (2020). “Extending Network Programmability to the Things Overlay using Distributed Industrial IoT Protocols”. *IEEE Transactions on Industrial Informatics*, 17(1), 251-259. [IF: 10.215]

**Municio, E.**, Balemans, N., Latré, S., & Marquez-Barjal, J. (2020, January). “Leveraging distributed protocols for full End-to-End softwarization in IoT networks”. In *2020 Annual Consumer Communications & Networking Conference (CCNC)* (pp. 1-6). IEEE. [IF: N/A]

**Municio, E.**, Daneels, G., De Brouwer, M., Ongenaes, F., De Turck, F., Braem, B., Famaey, J. & Latré, S. (2019). “Continuous Athlete Monitoring in Challenging Cycling Environments Using IoT Technologies”. *IEEE Internet of Things Journal*, 6(6), 10875 [IF: 9.936]

**Municio, E.**, Daneels, G., Vučinić, M., Latré, S., Famaey, J., Tanaka, Y., Brun, K., Muraoka, K., Vilajosana, X. & Watteyne, T. (2019). Simulating 6TiSCH networks. *Transactions on Emerging Telecommunications Technologies*, 30(3), e3494. [IF: 2.638]

**Municio, E.**, Marquez-Barja, J., Latré, S., & Vissicchio, S. (2018). “Whisper: Programmable and flexible control on Industrial IoT networks” *Sensors*, 18(11), 4048. [IF: 3.576]

**Municio, E.**, Spaey, K., & Latré, S. (2018). “A distributed density optimized scheduling function for IEEE 802.15. 4e TSCH networks”. *Transactions on Emerging Telecommunications Technologies*, 29(7), e3420. [IF: 2.638]

Daneels, G., **Municio, E.**, Van de Velde, B., Ergeerts, G., Weyn, M., Latré, S., & Famaey, J. (2018). “Accurate energy consumption modelling of IEEE 802.15. 4e TSCH using dual-band OpenMote hardware”. *Sensors*, 18(2), 437. [IF: 3.576]

Simo-Reigadas, J., **Municio, E.**, Morgado, E., Castro, E. M., Martinez, A., Solorzano, L. F., & Prieto-Egido, I. (2015). “Sharing low-cost wireless infrastructures with telecommunications operators to bring 3G services to rural communities”. *Computer Networks*, 93 [IF: 4.474]

For a full list of the publications please visit <https://emunicio.github.io/publications/>

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## RESEARCH PROJECTS

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European Projects:

EU-FP7 [TUCAN3G](#) (2013-2015), Celtic+ [FlexNet](#) (2018-2021), H2020 [ProTego](#) (2019-2022), H2020 [DAEMON](#) (2021-2023), H2020 [Vital-5G](#) (2021-2023), H2020 [InterConnect](#) (2019-2023), SNS Stream A 01-01 [BeGREEN](#) (2023)

National Projects (Belgium):

ICON [iFest](#) (2015-2017), ICON [CONAMO](#) (2016-2018), ICON [Smart Waterway](#) (2019-2021)

National Projects (Spain):

UNICO [Open6G](#) (2022)

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## SKILLS

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Languages: Spanish: Native English: Fluent Dutch: B1 French: A2

“More” languages:

Strong skills: C, C++, Python, Unix Shell Scripting, Java, Matlab, and LaTeX

Rusted skills: Ruby, PHP, Objective-C, Assembly, Ada, Perl, TCL and VHDL

Tools and Platforms: J-Link, GNU Radio, 6TiSCH Simulator, OpenWSN, Contiki, ns-3, Jupyter, TensorFlow, PyTorch, Ansible, Juju charms, Grafana, MQTT, MySQL, PostgreSQL, OSM, OpenStack, jFed, Chamaleon Cloud, 5G-Empower, Click, OAI, srsRAN, O-RAN-SC, ONOS, Kubernetes and Docker