

About

I am a Visiting Professor at **Universidad Carlos III de Madrid, Department of Telematic Engineering**. I am also teaching in the same university. My research interests include Wireless Networks, 5G Networks, Mobile Networks, Machine Learning and Big Data.

Academic and Professional Background

Feb 2022	Visiting Professor - Universidad Carlos III de Madrid, Department of Telematic Engineering Leganes, Spain.
Mar 2017	Post-Doc researcher - Universidad Carlos III de Madrid, Department of Telematic Engineering Leganes, Spain.
Sep 2015	Post-Doc researcher - Institute IMDEA Networks , Leganes, Spain.
Sep 2015	Lecturer - Universidad Carlos III de Madrid , Leganes, Spain.
Aug 2014	Research fellow - IEIT-CNR , Turin, Italy.
Mar 2013	Researcher - Istituto Superiore Mario Boella , Turin, Italy.
Sep 2012	PhD title in Telematic Engineering Universidad Carlos III de Madrid , Leganes, Spain. Score: <i>Summa cum laude</i> . Advisors: Prof. Maria Calderon Pastor and Prof. Carlos J. Bernardos Cano
Dec 2009	FPU grant from the Spanish Ministry of Science and Innovation.
Sep 2009	MSc title in Telematic Engineering Universidad Carlos III de Madrid , Leganes, Spain. Score: <i>Summa cum laude</i>
Oct 2008	PhD candidate - Institute IMDEA Networks , Leganes, Spain.
Apr 2008	MSc Title in Computer Science Engineering Politecnico di Torino , Turin, Italy. Score: 110/110

Teaching experience

2021-2022	Access networks and shared media - Bachelor in Telecommunication Technologies Engineering Universidad Carlos III de Madrid , Spain. (English and Spanish) Multimedia Networks - Bachelor in Sound and Image Engineering Universidad Carlos III de Madrid , Spain. (Spanish only) Core Networks in 5G (Coord.) - Master in NFV and SDN for 5G Networks Universidad Carlos III de Madrid , Spain (English Only).
2020-2021	Access networks and shared media - Bachelor in Telecommunication Technologies Engineering Universidad Carlos III de Madrid , Spain. (English only) Core Networks in 5G (Coord.) - Master in NFV and SDN for 5G Networks Universidad Carlos III de Madrid , Spain (English Only). 5G Connectivity - 5G Academy - Università Federico II di Napoli , Italy (Italian only)
2019-2020	Access networks and shared media - Bachelor in Telecommunication Technologies Engineering Universidad Carlos III de Madrid , Spain. (English only) Mobile and Wireless networks - Bachelor in Telecommunication Technologies Engineering Universidad Carlos III de Madrid , Spain. (Spanish only) Internet Measurements - Master in Telematic Engineering Universidad Carlos III de Madrid , Spain. (English only) 5G Connectivity - 5G Academy - Università Federico II di Napoli , Italy (Italian only)
2018-2019	Access networks and shared media - Bachelor in Telecommunication Technologies Engineering Universidad Carlos III de Madrid , Spain. (English only) Core Networks in 5G (Coord.) - Master in NFV and SDN for 5G Networks Universidad Carlos III de Madrid , Spain (English Only).
2017-2018	Access networks and shared media - Bachelor in Communication System Engineering Universidad Carlos III de Madrid , Spain. (in English and Spanish) Core Networks in 5G (Coord.) - Master in NFV and SDN for 5G Networks Universidad Carlos III de Madrid , Spain (English Only).
2016-2017	Access networks and shared media - Bachelor in Communication System Engineering Universidad Carlos III de Madrid , Spain. (in English and Spanish)
2015-2016	Access networks and shared media - Bachelor in Communication System Engineering Universidad Carlos III de Madrid , Spain. (in English and Spanish)

Projects and Grants

DAEMON	<i>Work package 3 Leader, Principal Investigator</i> H2020 program, 2021-2023.
5G-TOURS	<i>Researcher</i> , H2020 program, 2019-2022.
5GMonArch	<i>Deputy Technical Manager</i> , H2020 program, 2017-2019.
DTL	<i>Grantee</i> , 2017-2018.
5GNORMA	<i>Work package 5 leader</i> , H2020 program, 2015-2017.
GAIN	<i>Researcher</i> , FP7 program, 2012-2014.
MEDIEVAL	<i>Researcher</i> , FP7 program, 2010-2013.
CARMEN	<i>Researcher</i> , FP7 program, 2008-2010.
GEONET	<i>Researcher</i> , FP7 program, 2008-2010.

Publications

Conferences / Workshops

1. G. Garcia-Aviles, A. Garcia-Saavedra, M. Gramaglia, X. Costa-Perez, P. Serrano and A. Banchs **"Nuberu: reliable RAN virtualization in shared platforms"** in *ACM MobiCom 21*, 2021
2. A. Banchs, M. Fiore, A. Garcia-Saavedra, M. Gramaglia **"Network intelligence in 6G: challenges and opportunities"** in *ACM MobiArch 21*, 2021
3. L. Vignaroli, M. Gramaglia, M. Fuentes, A. Casella, R. Odarchenko, L. Natale, B. Altman and F. D'Andria **"The Touristic Sector in the 5G Technology Era: The 5G-TOURS Project Approach"**
4. M. Gramaglia, V. Sciancalepore, R. Perez, F.J. Fernandez-Maestro, P. Serrano and A. Banchs **"Experimenting with SRv6: a tunneling protocol supporting network slicing in 5G and beyond"** in *IEEE CAMAD 2020*. 2020
5. D. Bega, M. Gramaglia, M. Fiore, A. Banchs, and X. Costa-Perez **"AZTEC: Anticipatory Capacity Allocation for Zero-Touch Network Slicing"** in *IEEE INFOCOM 20*. 2020.
6. C. Marquez, M. Gramaglia, M. Fiore, A. Banchs, and Z. Smoreda **"Identifying Common Periodicities in Mobile Service Demands with Spectral Analysis"** in *IEEE MedComNet*. 2020.
7. M. Gramaglia, P. Serrano, A. Banchs, G. Garcia-Aviles, A. Garcia-Saavedra, and R. Perez **"The case for serverless mobile networking"** in *IFIP Networking 2020 - Network Slicing workshop*. 2020.
8. J. A. Ayala-Romero, A. Garcia-Saavedra, M. Gramaglia, X. Costa-Perez, A. Banchs, and J. J. Alcaraz **"vrAln: A Deep Learning Approach Tailoring Computing and Radio Resources in Virtualized RANs"** in *ACM MobiCom 19*. 2019.
9. D. Bega, M. Gramaglia, M. Fiore, A. Banchs, and X. Costa-Perez **" α -OMC: Cost-Aware Deep Learning for Mobile Network Resource Orchestration"** in *IEEE INFOCOM 19 WORKSHOPS*. 2019.
10. D. Bega, M. Gramaglia, M. Fiore, A. Banchs, and X. Costa-Perez **"DeepCog: Cognitive Network Management in Sliced 5G Networks with Deep Learning"** in *IEEE INFOCOM 19*. 2019.
11. Ö. Bulakci, Q. Wei, A. Gopalasingharm, A. De Domenico, M. Shariat, E. Pateromichelakis, F. Moggio, D. Tsolkas, C. Mannweiler, M. Gramaglia, S. Papadopoulos, M. Rates Crippa, and D. Tzovaras **"Identifying 5G System Enhancements: Enabling Technologies for Multi-Service Networks"** in *IEEE CSCN 18*. 2018.
12. D. Gutierrez-Estevez, N. Di Pietro, A. De Domenico, M. Gramaglia, U. Elzur, and Y. Wang **"5G-MonArch Use Case for ETSI ENI: Elastic Resource Management and Orchestration"** in *IEEE CSCN 18*. 2018.
13. C. Marquez, M. Gramaglia, M. Fiore, A. Banchs, and X. Costa-Perez **"How Should I Slice My Network? A Multi-Service Empirical Evaluation of Resource Sharing Efficiency"** in *ACM MobiCom 18*. 2018
14. M. Gramaglia, I. Labrador Pavon, F. Gringoli, G. Garcia-Aviles, and P. Serrano **"Design and Validation of a Multi-service 5G Network with QoE-aware Orchestration"** in *ACM WiNTECH 18*. 2018.
15. A. Zafeiropoulos, P. Gouvas, E. Fotopoulou, G. Tsiolis, T. Xirofotos, J. Bonnet, G. Carrozzo, S. Rizou, A. Gavras, M. Barros, X. Costa-Perez, A. Prasad, M. Gramaglia, A. Tzanakaki, D. Simeonidou, J. Cosmas, M. Fallgren, R. Muñoz, and R. Vilalta **"Enabling Vertical Industries Adoption of 5G Technologies: A Cartography of Evolving Solutions"** In: *2018 European Conference on Networks and Communications (EuCNC)*. 2018
16. G. Garcia-Aviles, M. Gramaglia, P. Serrano, M. Portoles, A. Banchs, and F. Maino **"SEMPER: A Stateless Traffic Engineering Solution for WAN Based on MP-TCP"** In: *IEEE International Conference on Communications (ICC)*, 2018.
17. D. Gutierrez-Estevez, M. Gramaglia, A. Domenico, N. Pietro, S. Khatibi, K. Shah, D. Tsolkas, P. Arnold, and P. Serrano **"The path towards resource elasticity for 5G network architecture"** In: *2018 IEEE Wireless Communications and Networking Conference Workshops (WCNCW)*. 2018.

18. A. Torre, M. Fiore, C. Casetti, M. Gramaglia, and M. Calderon **"Bidirectional highway traffic for network simulation"** In: *2017 IEEE Vehicular Networking Conference (VNC)*. 2017.
19. C. Marquez, M. Gramaglia, M. Fiore, A. Banchs, C. Ziemlicki, and Z. Smoreda **"Not All Apps Are Created Equal: Analysis of Spatiotemporal Heterogeneity in Nationwide Mobile Service Usage"** In: *ACM CoNEXT*. 2017.
20. F. Z. Yousaf, M. Gramaglia, V. Friderikos, B. Gajic, D. von Hugo, B. Sayadi, V. Sciancalepore, and M. Crippa **"Network Slicing with Flexible Mobility and QoS/QoE Support for 5G Networks"** In: *IEEE International Conference on Communications (ICC) Workshop 5GArch*. 2017.
21. M. Gramaglia, M. Fiore, A. Tarable, and A. Banchs **"Preserving Mobile Subscriber Privacy in Open Datasets of Spatiotemporal Trajectories"** In: *IEEE INFOCOM*, 2017.
22. D. Bega, M. Gramaglia, A. Banchs, V. Sciancalepore, K. Samdanis, and X. Costa-Perez **"Optimising 5G infrastructure markets: The Business of Network Slicing"** In: *IEEE INFOCOM*, 2017.
23. V. Sciancalepore, K. Samdanis, X. Costa-Perez, D. Bega, M. Gramaglia, and A. Banchs **"Mobile Traffic Forecasting for Maximizing 5G Network Slicing Resource Utilization"** In: *IEEE INFOCOM*, 2017.
24. B. Sayadi, M. Gramaglia, V. Friderikos, D. von Hugo, P. Arnold, M. Alberi-Morel, M.A. Puente, V. Sciancalepore, I. Digon, and M. Crippa **"SDN for 5G Mobile Networks: NORMA Perspective"**. In: *11th CROWNCOM International Conference*. 2016.
25. M. Gramaglia, I. Digon, V. Friderikos, D. von Hugo, C. Mannweiler, M.A. Puente, K. Samdanis, and B. Sayadi **"Flexible connectivity and QoE/QoS management for 5G Networks: The 5G NORMA view"** In: *IEEE International Conference on Communications (ICC) Workshop 5GArch*. 2016.
26. C. Glacet, M. Fiore, and M. Gramaglia **"Temporal Connectivity of Vehicular Networks: The Power of Store-Carry-and-Forward"** In: *IEEE Vehicular Networking Conference (VNC)*. 2015.
27. M. Gramaglia and M. Fiore **"On the Level of Detail of Synthetic Highway Traffic Necessary to Vehicular Networking Studies"** In: *IEEE Vehicular Networking Conference (VNC)*. 2015.
28. M. Gramaglia and M. Fiore **"Hiding Mobile Traffic Fingerprints with GLOVE"** In: *ACM CoNEXT*. 2015.
29. M. Gramaglia and M. Fiore **"On the anonymizability of mobile traffic datasets"** In: *NetMob book of abstracts*. 2015
30. M. Gramaglia, O. Trullols-Cruces, D. Naboulsi, M. Fiore, and M. Calderon. **"Vehicular Networks on Two Madrid Highways"**. In: *11th IEEE International Conference on Sensing, Communication, and Networking (SECON)*. 2014.
31. M. Gramaglia, C.J. Bernardos, M. Calderon, and A. de la Oliva. **"Performance evaluation of a tree-based routing and address autoconfiguration for vehicle-to-Internet communications"**. In: *11th International Conference on ITS Telecommunications (ITST)*. 2011.
32. M. Gramaglia, P. Serrano, J.A. Hernández, M. Calderon, and C.J. Bernardos. **"New insights from the analysis of free flow vehicular traffic in highways"**. In: *IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)*. 2011.
33. M. Gramaglia, M. Calderon, and C.J. Bernardos. **"TREBOL: Tree-Based Routing and Address Autoconfiguration for Vehicle-to-Internet Communications"**. In: *IEEE 73rd Vehicular Technology Conference (VTCSpring)*. 2011.

Journals

1. I. Ucar, M. Gramaglia, M. Fiore, Z. Smoreda, and E. Moro **"News or Social Media? Socioeconomic divide of mobile service consumption"** in *Journal of the Royal Society Interface*, accepted, 2022.
2. M. Gramaglia, M. Fiore, A. Furno and Razvan Stanica **"GLOVE: towards privacy-preserving publishing of record-level-truthful mobile phone trajectories"** in *ACM/IMS Transactions on Data Science*, 2021
3. J. A. Ayala-Romero, A. Garcia-Saavedra, M. Gramaglia, X. Costa-Perez, A. Banchs, and J. J. Alcaraz **"vrAln: Deep Learning based Orchestration for Computing and Radio Resources in vRANs"** in *IEEE Transactions on Mobile Computing*. 2020 (IF 4.549)
4. D. Bega, M. Gramaglia, A. Garcia-Saavedra, M. Fiore, A. Banchs and X. Costa-Perez **"Network Slicing Meets Artificial Intelligence: An AI-Based Framework for Slice Management"** in *IEEE Communications Magazine*. 2020 (IF 11.682)
5. G. Garcia-Aviles, C. Donato, M. Gramaglia, P. Serrano and A. Banchs **"ACHO: A framework for flexible re-orchestration of virtual network functions"** in *Elsevier Computer Networks*. 2020 (IF 4.200)
6. G. Garcia-Aviles, M. Gramaglia, P. Serrano, F. Gringoli, Sergio Fuente-Pascual, I. Labrador-Pavon **"Experimenting with open source tools to deploy a multi-service and multi-slice mobile network"** in *Elsevier Computer Communications*. 2019. (IF 2.613)
7. D. Gutierrez-Estevez, M. Gramaglia, A. De Domenico, G. Dandachi, S. Khatibi, D. Tsolkas, I. Balan, A. Garcia-Saavedra, U. Elzur and Y. Wang **"Artificial Intelligence for Elastic Management and Orchestration of 5G Net-**

works” in *IEEE Wireless Communications*, 2019 (IF 9.202).

8. C. Marquez, M. Gramaglia, M. Fiore, A. Banchs and X. Costa-Perez **“Resource Sharing Efficiency in Network Slicing”** in *IEEE Transactions on Network and Service Management*. 2019 (IF 4.682)
9. V. Sciancalepore, C. Mannweiler, F. Zarrar Yousaf, P. Serrano, M. Gramaglia, J. Bradford and I. Labrador-Pavon **“A Future-Proof Architecture for Management and Orchestration of Multi-Domain NextGen Networks”** in *IEEE Access*. 2019 (IF 4.098)
10. M. Shariat, Ö. Bulakci, A. De Domenico, C. Mannweiler, M. Gramaglia, Q. Wei, A. Gopalasingham, E. Pateromichelakis, F. Moggio, D. Tsolkas, B. Gajic, M. Rates Crippa and Sina Khatibi **“A Flexible Network Architecture for 5G Systems”** in *Wireless Communications and Mobile Computing*. 2019 (IF 1.396)
11. D. Bega, M. Gramaglia, A. Banchs, V. Sciancalepore and X. Costa-Perez **“A Machine Learning approach to 5G Infrastructure Market optimization”** in *Transactions on Mobile Computing*. 2019 (IF 4.474)
12. D. Bega, A. Banchs, M. Gramaglia, X. Costa-Perez and P. Rost **“CARES: Computation-aware Scheduling in Virtualized Radio Access Networks”** in *IEEE Transactions on Wireless Communications*. 2018 (IF 5.888)
13. G. Garcia-Aviles, M. Gramaglia, P. Serrano, and A. Banchs **“POSENS: a practical open-source solution for end-to-end network slicing”** in *IEEE Wireless Communications (Special Issue: 5G Testing and Field Trials)*. 2018 (IF 9.202).
14. P. Serrano, M. Gramaglia, D. Bega, D. Gutierrez-Estevez, G. Garcia-Aviles, and A. Banchs **“The path toward a cloud-aware mobile network protocol stack”** in *Wiley Transactions on Emerging Telecommunications Technologies*. 2018. (IF 1.610).
15. D. Bega, M. Gramaglia, C. J. Bernardos Cano, A. Banchs, and X. Costa-Perez **“Toward the network of the future: From enabling technologies to 5G concepts”** *Wiley Transactions on Emerging Telecommunications Technologies*. 2017 (IF 1.610).
16. M. Gramaglia, O. Trullols-Cruces, D. Naboulsi, M. Fiore, and M. Calderon **“Mobility and connectivity in highway vehicular networks: A case study in Madrid”**. *Elsevier Computer Communications*. 2015. (IF 2.613)
17. L. Bedogni, M. Gramaglia, A. Vesco, M. Fiore, J. Härrä, and F. Ferrero **“The Bologna ringway dataset: improving road network conversion in SUMO and validating urban mobility via navigation services”**. in *IEEE Transactions on Vehicular Technology*. 2015. (IF 4.432)
18. M. Gramaglia, M. Fiore, and M. Calderon **“Measurement-based modeling of inter-arrivals for the simulation of highway vehicular networks”**. *IEEE Communications Letters*. 2014 (IF 2.723).
19. M. Gramaglia, M. Calderon, and C.J. Bernardos. **“ABEONA Monitored Traffic:VANET-Assisted Cooperative Traffic Congestion Forecasting”**. *IEEE Vehicular Technology Magazine*. 2014 (IF 6.038).
20. M.I. Sanchez, M. Gramaglia, C.J. Bernardos, A. de la Oliva, and M. Calderon. **“On the implementation, deployment and evaluation of a networking protocol for VANETs: The VARON case”**. *Elsevier Ad-Hoc Networks*. 2014 (IF 3.151).
21. M. Gramaglia, C.J. Bernardos, and M. Calderon. **“Virtual induction loops based on cooperative vehicular communications”**. *MDPI Sensors*. 2013 (IF 2.475).
22. M. Gramaglia, C.J. Bernardos, I. Soto, M. Calderon, and R. Baldessari. **“IPv6 address autoconfiguration in geonetworking-enabled VANETs: characterization and evaluation of the ETSI solution”**. *EURASIP Journal on Wireless Communications and Networking*. 2012 (IF 2.407).
23. M. Gramaglia, M. Urueña, and I. Martinez-Yelmo. **“Off-line incentive mechanism for long-term P2P backup storage”**. *Elsevier Computer Communications*. 2012 (IF 2.613).
24. M. Gramaglia, C.J. Bernardos, and M. Calderon. **“Seamless internet 3G and opportunistic WLAN vehicular connectivity”**. *EURASIP Journal on Wireless Communications and Networking*, 2011 (IF 2.407).
25. M. Gramaglia, I. Soto, C.J. Bernardos, and M. Calderon. **“Overhearing Assisted Optimization of Address Auto-Configuration in Position Aware VANETs”**. *IEEE Transactions on Vehicular Technology*. 2011 (IF 4.432).
26. C.J. Bernardos, M. Gramaglia, L. Contreras, M. Calderon and I. Soto. **“Network-based Localized IP mobility Management: Proxy Mobile IPv6 and Current Trends in Standardization”**. *Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications (JoWUA), Advances in Wireless Mobile and Sensor Technologies*. 2010.

Book Chapters

1. M. Gramaglia, A. Kaloxylos, P. Spapis, X. Costa, L. Contreras, R. Trivisonno, G. Zimmermann, A. de la Oliva, P. Rost, and P. Marsch. **“E2E Architecture”**. In: *5G System Design: Architectural and Functional Considerations and Long Term Research*. 2018.

2. M. Gramaglia, M. Fiore, M. Calderon, O. Trullols-Cruces, D. Naboulsi “**Highway Road Traffic Modeling for ITS Simulation**” in *Networking Simulation for Intelligent Transportation Systems: High Mobile Wireless Nodes*, 2017.

Posters and demos

1. J. A. Ayala-Romero, A. Garcia-Saavedra, M. Gramaglia, X. Costa-Perez, A. Banchs, and Juan J. Alcaraz. “**Demo: vrAln Proof-of-Concept – A Deep Learning Approach for Virtualized RAN Resource Control**”. In *ACM Mobicom 19*. 2019. **Best runner-up demo**
2. M. Gramaglia. “**Optimized IPv6 Internet access from vehicles in multi-hop and heterogeneous environments**”. In: *IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)*. 2011.

Theses

1. M. Gramaglia. “**VANET-Based optimization of infotainment and traffic efficiency vehicular services**”. *Ph.D. Thesis*, Madrid, Spain, September 2012.
2. M. Gramaglia. “**Speeding IPv6 Address Autoconfiguration for VANETs through Caching**”. *M.Sc. Thesis*, Madrid, Spain, September 2009.
3. M. Gramaglia. “Analysis and implementation of routing algorithms for MAC-PHY 802.15.4 based ad-hoc networks” *M.Sc. Thesis* Turin, Italy, April 2008.

Patents

1. V. Sciancalepore, X. Costa-Perez, A. Banchs and M. Gramaglia. “**Method and system for network slice allocation**”. 2018.
2. M. Fiore, A. Tarable and M. Gramaglia. “**Method for melting of spatio-temporal trajectories**”. 2016.

Professional activities

Editorships

2021: Springer Journal of Network and Systems Management (SI on Network Management in Beyond 5G Systems)

Chairing Service

2021 IEEE SECON (Publicity Chair), ACM MobileServerless’21 (Chair)
2017 IEEE CSCN (Publicity Chair)
2016 IEEE Online Greencomm (EDAS Chair)

TPC Service

2022 CCNC, WCNC, Starless
2021 IEEE ICC MWN, 5G-WF, ANTS 21, Globecom MWN, CSCN
2020 ACM Mobicom (Posters), ISWCS, IEEE Globecom MWN, EuCNC RAS, IEEE INFOCOM 2020 NI Workshop, IEEE WCNC, IEEE SmartSys, IEEE ICC IoT Track
2019 EuCNC RAS, IEEE Globecom MWN, IEEE WCNC, Wireless Days, ACM Big-DAMA, IEEE VTC
2018 IEEE SmartVehicles, EuCNC RAS, IEEE CSCN, IEEE Globecom MWN, IEEE WCNC, IEEE VTC, ACM WiN-TECH
2017 IEEE SmartVehicles, EuCNC NET, IEEE ANTS, IEEE VTC
2016 IEEE CSCN, IEEE SmartVehicles, IEEE VTC

Referee Service

IEEE Transactions on Intelligent Transportation Systems, IEEE Communication Letters, IEEE INFOCOM, IEEE Transactions on Vehicular Technology, MDPI Sensors, Elsevier Computer Communications, Elsevier Computer Networks, IEEE Vehicular Technology Conference, IEEE Transactions on Vehicular Technology, IEEE Vehicular Networking Conference, IEEE Transactions on Mobile Computing, IEEE Transactions on Networking, IEEE Transactions on Network Management.

Personal skills

Languages

Italian Native speaker.
English Speak, read and write with proficiency.
Spanish Speak, read and write with proficiency.

Computer Programming

C, C++, Java, JavaScript, Python, UNIX shell scripting, SQL, CUDA, Pandas, R, Matlab, Numpy, Git, SVN, Spark, Scala.

Networking protocols and technologies

IEEE 802.11, IPv6, LTE, 5G, SDN, NFV, ETSI NFV MANO, Machine Learning, Artificial Intelligence.

Contact

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