

MARCOS OLIVEIRA

CONTACT INFORMATION	Department of Computational Social Science GESIS–Leibniz Institute for the Social Sciences Unter Sachsenhausen 6-8 50667 Germany	<i>E-mail:</i> moliveira@tuta.io <i>Web:</i> https://marcosoliveira.info/
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RESEARCH INTERESTS	My interests lie in complex systems, human dynamics, and self-organizing mechanisms, particularly in using network science and data analysis to understand the emergence of social phenomena in cities such as crime concentration and to uncover the intricacies that drive the intelligence in swarm intelligent algorithms.
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EDUCATION	Ph.D. Computer Science, <i>Florida Institute of Technology</i> , USA Dissertation: "The Growth, Structure, and Dynamics of Crime in Cities"	2013–2017
	M.Sc. Computer Engineering, <i>Universidade de Pernambuco</i> , Brazil Thesis: "Assessing and Modifying Information Flows in Particle Swarm Optimizers"	2011–2013
	B.Sc. Computer Engineering, <i>Universidade de Pernambuco</i> , Brazil Project: "Hopfield Neural Networks in FPGA for Routing in Communication Networks"	2006–2011

RESEARCH EXPERIENCE	Postdoctoral researcher Department of Computational Social Science <i>GESIS–Leibniz Institute for the Social Sciences, Cologne, Germany</i>	Jan/2018 – present
	Graduate Research Assistant Department of Computer Sciences <i>Florida Institute of Technology, Melbourne, USA</i>	Aug/2017 – Dec/2017
	Graduate Mentor Department of Computer Sciences <i>Florida Institute of Technology, Melbourne, USA</i>	Jun/2014 – Aug/2014
	Scientific Initiation Department of Computer Engineering <i>University of Pernambuco, Recife, Brazil</i>	Aug/2009 – Oct/2010

MANUSCRIPTS

<i>IN PRESS</i>	Oliveira, M. , Pinheiro, D., Macedo, M., Andrade, B., Bastos-Filho, C., and Menezes, R. "Unveiling Swarm Intelligence with Network Science—the Metaphor Explained" [arxiv]
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PUBLICATIONS

<i>JOURNAL</i>	Oliveira, M. , Ribeiro, E., Bastos-Filho, C., and Menezes, R. "Spatio-temporal variations in the urban rhythm: the travelling waves of crime" <i>EPJ Data Science</i> (2018) 7:29. [doi] <ul style="list-style-type: none">• Highlight on SpringerBlog, EPJ.org.• Preprint featured on the PLOS Complexity Channel.
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	Oliveira, M. , Bastos-Filho, C., and Menezes, R. "The scaling of crime concentration in cities" <i>PLOS ONE</i> 12(8): e0183110. 2017. [doi] <ul style="list-style-type: none">• Highlight on Florida Tech's blog.
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	Oliveira, M. , Bastos-Filho, C., and Menezes, R. "Using Network Science to Assess Particle Swarm Optimizers" <i>Social Network Analysis and Mining</i> 5.1 (2015): 1-13. 2015. [doi]
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<i>CONFERENCE</i>	Taw, L., Gurrapadi, N., Macedo, M., Oliveira M. , Pinheiro, D., Bastos-Filho, M., and Menezes, R. "Characterizing the Social Interactions in the Artificial Bee Colony Algorithm." To appear, <i>2019 IEEE Congress on Evolutionary Computation (IEEE CEC)</i> , 2019. Wellington, New Zealand. [arxiv]
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	Barbosa, H., Oliveira, M. , Pacheco, D., Menezes, R., and Goshal, G. "The Influence of the Circadian and Ultradian Rhythms to Human Mobility: Empirical Evidences from Location-Based Check-Ins" In: <i>NERCCS 2018: First Northeast Regional Conference on Complex Systems</i> , 2018. Binghamton, NY, USA.
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- Oliveira, M.**, Pinheiro, D., Macedo, M., Bastos-Filho, C., and Menezes, R. "Better Exploration–Exploitation Pace, Better Swarm: Examining the Social Interactions" In: *4th IEEE Latin American Conference on Computational Intelligence (LA-CCI)*, 2017. Arequipa, Peru. [\[doi\]](#)
- Elliott, D., Tomasini, M., **Oliveira, M.**, and Menezes, R. "Tippers and Stiffers: an Analysis of Tipping Behavior in Taxi Trips" In: *IEEE Ubiquitous Intelligence and Computing*, 2017. San Francisco, California, USA. [\[doi\]](#)
- Pacheco, D., **Oliveira, M.**, and Menezes, R. "Towards a framework to assess social disorganization in neighborhoods using social media: a case study on football supporters in the United Kingdom" In: *AI4BigData at the 30th International FLAIRS Conference*, 2017. Marco Island, Florida, USA. [\[link\]](#)
- Oliveira, M.**, Pinheiro, D., Andrade, B., Bastos-Filho, C.J.A., and Menezes, R. "Communication Diversity in Particle Swarm Optimizers" In: *ANTS 2016, Tenth International Conference on Swarm Intelligence*, 2016. Brussels, Belgium. [\[doi\]](#)
- Oliveira, M.**, Serrano, H., Yehle, T., White, S., and Menezes, R. "From Criminal Spheres of Familiarity to Crime Networks" In: *6th Workshop on Complex Networks (CompleNet)*, 2015. New York, USA. [\[doi\]](#)
- Oliveira, M.**, Bastos-Filho, C.J.A., and Menezes, R. "Towards a Network-based Approach to Analyze Particle Swarm Optimizers" In: *Proceedings of 2014 IEEE Swarm Intelligence Symposium*, 2014. Orlando, USA. [\[doi\]](#)
- White, S., Yehle, T., Serrano, H., **Oliveira, M.**, and Menezes, R. "The Spatial Structure of Crime in Urban Environments" In: *The 6th International Conference on Social Informatics. First Workshop on Criminal Network Analysis and Mining*, 2014. Barcelona, Spain. [\[doi\]](#)
- Oliveira, M.**, Bastos-Filho, C., and Menezes, R. "Political Social Networks Reveal Strong Party Loyalty in Brazil and Weak Regionalism" In: *The Sixth ASE International Conference on Social Computing*, 2014. Stanford, USA. [\[doi\]](#)
- Oliveira, M.**, Bastos-Filho, C., and Menezes, R. "Assessing Particle Swarm Optimizers Using Network Science Metrics" In: *Studies in Computational Intelligence*. Springer Berlin Heidelberg, 2013, v. 476, p. 173-184. [\[doi\]](#)
- Oliveira, M.**, Bastos-Filho, C., and Menezes, R. "Using Network Science to Define a Dynamic Communication Topology for Particle Swarm Optimizers" In: *Studies in Computational Intelligence*. Springer Berlin Heidelberg, 2013, v. 424, p. 39-47. [\[doi\]](#)
- Oliveira, M.** and Bastos-Filho, C. "Uma Implementação em FPGA de Redes Neurais de Hopfield para Roteamento em Redes de Comunicação" (in Portuguese) In: *Anais do X Congresso Brasileiro de Inteligência Computacional*, 2011. Fortaleza, Brazil. [\[doi\]](#)
- Oliveira, M.**, Lacerda, M., Barbosa, E., Barbosa, P., and Bastos-Filho, C. "Car Setup Optimization Using Multi-Objective Swarm Algorithms" In: *Anais do X Congresso Brasileiro de Inteligência Computacional*, 2011. Fortaleza, Brazil. [\[doi\]](#)
- Bastos-Filho, C. J. A., **Oliveira, M.**, Silva, D., and Santana, R. "Optimizing a Routing Algorithm Based on Hopfield Neural Networks for Graphic Processing Units" In: *Proceedings of IEEE Symposium on Foundations of Computational Intelligence*, 2011. Paris, France. [\[doi\]](#)
- Bastos-Filho, C., **Oliveira, M.**, Nascimento, D., and Ramos, A. "Impact of the Random Number generator quality on particle swarm optimization algorithm running on graphic processor units" In: *Proceedings of the Tenth IEEE International Conference on Hybrid Intelligent Systems*, 2010. Atlanta, USA. [\[doi\]](#)
- BOOK CHAPTER **Oliveira, M.**, and Menezes, R. "Spatial concentration and temporal regularities in crime" To appear in: "Understanding Crime through Science" (Springer, 2019). [\[arxiv\]](#)
- Lins, A., Bastos-Filho, C.J.A., Nascimento, D., **Oliveira, M.**, and Lima-Neto, F. "Analysis of the Performance of the Fish School Search Algorithm Running in Graphic Processing Units" In: *Theory and New Applications of Swarm Intelligence*. 1ed.: InTech, 2012, v. 1, p. 17-32. [\[doi\]](#)

Bastos-Filho, C.J.A., **Oliveira, M.**, and Nascimento, D. "Running Particle Swarm Optimization on Graphic Processing Units" In: *Search Algorithms and Applications*. 1ed.: InTech, 2011, v. 1, p. 47-68. [\[doi\]](#)

SERVICE

WORKSHOPS & ORGANIZED SESSIONS	<i>NetCrime—Symposium on the Structure and Mobility of Crime</i>	2019
	NetSci 2019, Satellite Workshop, Burlington, USA (27 May)	
	With Luiz G.A. Alves, Toby Davies, Ronaldo Menezes, and Bruno Requiao	
	<i>Social Complex Networks</i>	2019
	Session at the 4th European Conference on Social Networks, Zurich, Austria With Haiko Lietz, Martin Stark, and Kai Fischbach	
	<i>NetCrime—Symposium on the Structure and Mobility of Crime</i>	2018
	NetSci 2018, Satellite Workshop, Paris, France (11 June)	
	With Toby Davies, Ronaldo Menezes, and Bruno Requiao	
	<i>NetCrime—Symposium on the Structure and Mobility of Crime</i>	2017
	NetSci 2017, Satellite Workshop, Indianapolis, USA (19 June) With Hugo Barbosa and Ronaldo Menezes	
	<i>NetCrime—Symposium on the Structure and Mobility of Crime</i>	2015
	NetSci 2015, Satellite Workshop, Zaragoza, Spain (1 June)	
	With Carmelo Bastos-Filho, Hugo Barbosa, Ronaldo Menezes, Fernando Buarque	
SEMINAR & TUTORIALS	<i>Introduction to Python's graph-tool</i>	2019
	Tutorial at the 4th European Conference on Social Networks, Zurich, Austria With Haiko Lietz	
	<i>Introduction to Social Network Science with Python</i>	2019
	GESIS Methodenseminar, Cologne, Germany With Fariba Karimi and Haiko Lietz	
	<i>Performing embarrassingly parallel data analysis with IPython</i>	2018
	Tutorial at Complexity72h, Lucca, Italy	

REFeree WORK

Journal of the Royal Society Interface, IEEE Transactions on Evolutionary Computation, Journal of Quantitative Criminology, PLOS One, EPJ Data Science, Applied Network Science, Heliyon, Engineering Optimization, IEEE Computational Intelligence Magazine, MethodsX.

TECHNOLOGIES

PROGRAMMING LANGUAGES	Python (pandas, shapefile, numpy, scipy, matplotlib, igraph, networkx), C/C++ (gdal, glib2, cairo, gtk), Bash scripting (bash, awk, sed), R, NetLogo, CUDA, and Java.
OTHERS	MySQL, MongoDB, QGIS, Inkscape, L ^A T _E X, Linux, and MacOS.

INDUSTRY EXPERIENCE

Software developer	Mar/2011 – May/2013
<i>FITec – Technological Innovations, Recife, Brazil</i>	
GNU/Linux development for embedded system which included developing several device drivers for some ARM features and peripherals (e.g., buzzer, sound, WIFI Adapter).	
Internship	Oct/2010 – Mar/2011
<i>FITec – Technological Innovations, Recife, Brazil</i>	
Development of graphical libraries for embedded systems.	

AWARDS

<i>Outstanding Graduate Student of the Year</i>	2017
Florida Institute of Technology	
<i>Outstanding Graduate Student of the Year</i>	2016
Florida Institute of Technology	

PERSONAL

Birthplace: Recife, Brazil

Current city: Cologne, Germany