Marcos Oliveira

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Research Interests

My interests lie in complex systems and self-organizing mechanisms, particularly in using network science and data analysis to examine the emergence of social phenomena in cities such as crime concentration and to unveil the intricacies that drive the intelligence in swarm intelligent algorithms.

Education

Fall 2013 — Current	Ph.D. COMPUTER SCIENCE, **Florida Institute of Technology**, USA "Unveiling the Structure of Crime" Advisor: Prof. Ronaldo MENEZES
Fall 2011 — SPRING 2013	M.Sc. COMPUTER ENGINEERING, **Universidade de Pernambuco**, Brazil "Assessing and Modifying Information Flows in Particle Swarm Optimizers" Advisor: Prof. Carmelo BASTOS-FILHO
Fall 2006 — SPRING 2011	B.Sc. COMPUTER ENGINEERING, **Universidade de Pernambuco**, Brazil

Publications

Journal

Oliveira, M., Bastos-Filho, C., and Menezes, R. *"Using Network Science to Assess Particle Swarm Optimizers"* Social Network Analysis and Mining 5.1 (2015): 1-13. **[doi]**

Oliveira, M., Pinheiro, D., Macedo, M., Andrade, B., Bastos-Filho, C.J.A., and Menezes, R. *"Unveiling Self-Organized Structures of Interactions in Swarm Intelligence with Network Science"* (manuscript submitted for publication)

Oliveira, M., Bastos-Filho, C., and Menezes, R. *"The Scale-Invariance of Crime Concentration in Cities"* (manuscript in preparation)

Conference

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, Marco Island, Florida, USA.

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.

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 | 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]**

Activities

Co-Organizer of the Symposium on the Structure and Mobility of Crime, satellite event of the NetSci conference, with Ronaldo Menezes, Carmelo Bastos-Filho, Fernando Buarque, and Hugo Serrano. http://biocomplexlab.org/NetCrime/.

Work Experience

March 2011 — May 2013 | **Software developer**
FITec – Technological Innovations, Recife, Brazil
GNU/Linux development for embedded system which included developing several device drivers in order to make use of some ARM features (PWM, GPIO, etc) and peripherals (Buzzer, Sound, WIFI Adapter, etc).

October 2010 — March 2011 | **Internship**
FITec – Technological Innovations, Recife, Brazil
Development of graphical libraries for embedded systems.

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, LaTeX, Linux, and MacOS.

Awards

April 2016 | **Outstanding Graduate Student**
Florida Institute of Technology

Personal

Place of Birth | Recife, Brazil
Date of Birth | 04/Dec/1986
US visa | J-1