

Rafael Guimarães Ramos, PhD

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Researcher at the National Institute of Space Research (INPE). Av. dos Astronautas, 1.758 – Jardim da Granja. São José dos Campos – SP, 12227-010, Brazil.

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Interests

I am interested in data analysis to solve human problems, and in using geographical information to empower these analyses.

Key areas: Data Science, Spatial Analysis, Geographical Information Science, Mapping & Data Visualization, Urban Geography, Geography of Crime, Criminology, Spatial Models for Human Geography, Visual Computing.

Education

- Ph.D. (Sep.2014-Sep.2019) at the Department of Geography, University of California Santa Barbara, USA.
- M.A. (Mar.2011-Jun.2013) in Electrical Engineering (emphasis in Computer Engineering), University of Campinas, Brazil.
- B.S. (Mar.2006-Dec.2010) in Computer Engineering, University of Campinas, Brazil.

Experience

- Oct. 2019 (ongoing). Researcher at the National Institute of Space Research (INPE).
- Aug. 2013-Jul. 2014. Researcher at SimWorx Engineering, Research & Development.
- Aug. 2009-Dec. 2010. Research Internship at CTI Renato Archer.
- Aug. 2008-Jul. 2009. Research Internship at University of Campinas, School of Electrical and Computer Engineering.

Publications

- Journal publications:

RAMOS, R.G. 2021. Improving Victimization Risk Estimation : A Geographically Weighted Regression Approach. *ISPRS International J. Geo-Inf.* 2021, 10(6), 364.

RAMOS, R. G., SILVA, B. F., CLARKE, K. C., & PRATES, M. 2020. Too Fine to be Good? Issues of Granularity, Uniformity and Error in Spatial Crime Analysis. *Journal of Quantitative Criminology*, 1-25.

RAMOS, R. G. 2019. Does income inequality explain the geography of residential burglaries? The case of Belo Horizonte, Brazil. *ISPRS Int. J. Geo-Inf.* 2019, 8(10), 439.

- Work in Progress:

RAMOS, R. G., MELO, S. 2022. Income inequality and the geography of residential burglaries in Campinas, Brazil. (Submitted for review)

RAMOS, R. G., SCARABELLO, M. C., COSTA, W., SOTERRONI, A., ANDRADE, P. R., SIMOES, R., RUIVO, H. M. & RAMOS, F. M., 2022. Is the Forest Code enforcement enough to preserve Brazil's conservation priority areas?

RAMOS, R. G., SCARABELLO, M. C., COSTA, W., SOTERRONI, A., SIMOES, R., ANDRADE, P. R. & RAMOS, F. M. 2022 A mathematical programming approach to downscale land-use projections from the GLOBIOM-Brazil model.

RAMOS, R. G., 2022. Uniformity and robustness in kernel density estimation.

MELO, S., FOLHARINI, S. O., RAMOS, R. G. 2022. Land use and wildlife crime: assessing the edge effects.

RAMOS, R.G., BLAKELEY, S. L., MILLER, D. L. 2022. Predicting mosquito-borne illnesses using remote sensed imagery.

- Theses and Dissertations:

RAMOS, R. G. 2019. Methodological contributions to the spatial analysis of crime, with an application to residential burglaries in Belo Horizonte, Brazil. Dissertation (PhD) - University of California Santa Barbara, Department of Geography, Santa Barbara, CA.

RAMOS, R. G. 2013. Ambiente virtual de simulação e visualização do comportamento de risers. 81 f. Dissertação (mestrado) - Universidade Estadual de Campinas, Faculdade de Engenharia Elétrica e de Computação, Campinas, SP.

- Conference Papers:

RAMOS, R. G.; MARTINO, J. M.; MOROOKA, C. 2013. Visualization Environment with Real-Time Interaction for Simulation of Vertical Rigid Risers. In: Rio Pipeline, 2013, Rio de Janeiro. Proceedings of the Rio Pipeline 2013 Conference.

LOTUFO, R. A.; MACHADO, R. C.; KORBES, A.; RAMOS, R. G. 2009. AdessoWiki - Online Collaborative Scientific Programming Platform. In: WikiSym 2009, 2009, Orlando. The Proceedings of the 5th International Symposium on Wikis and Open Collaboration (WikiSym '09).

- Other Publications:

RAMOS, R. G.; MARTINO, J. M. 2012 . Ambiente Interativo em Tempo Real para Visualização de Risers Rígidos. (in Portuguese)

RAMOS, R. G.; SILVEIRA, G. ; MORONI, Artemis 2011. Um Sistema de Visão Robótica mais flexível para o Projeto AURAL. (in Portuguese)

Conferences

- AGU Annual Conference 2021. Poster presentation titled “Future prospects for native vegetation in Brazil's conservation priority areas”. Authors: Rafael Guimaraes. Ramos. Marluce da Cruz Scarabello, Aline Soterroni, Pedro R. Andrade, Rolf Simoes, Heloisa Ruivo, Fernando Ramos.

- AGU Annual Conference 2020. Poster presentation titled “A mathematical programming approach for downscaling projections from a land use change model”. Authors: Rafael Guimaraes. Ramos.

Marluce da Cruz Scarabello, Wanderson Costa, Aline Soterroni, Rolf Simoes, Pedro R. Andrade, Fernando Ramos.

- Spatial Statistics 2019: Towards Spatial Data Science, Sitges, Spain. Poster presentation titled “Improving crime rate standardization: a geographically weighted regression approach”. Authors: Rafael G. Ramos.
- AAG Annual Conference 2019, Washington D.C. Paper presentation titled “Social & Environmental Determinants of Urban Crime: residential burglaries in Belo Horizonte, Brazil”. Authors: Rafael G. Ramos.
- AAG Annual Conference 2017, Boston. Paper presentation titled “Is finer better? On the limits of crime data aggregation”. Authors: Rafael G. Ramos.
- AAG Annual Conference 2016, San Francisco. Poster presentation titled “Exploring the spatial-temporal relations between burglary and socioeconomic factors using GIS”. Authors: Rafael G. Ramos, Keith Clarke, Bráulio F. A. da Silva.

Presentations

- December 7th 2020. Poster presentation at AGU Annual Conference 2020. Poster titled “A mathematical programming approach for downscaling projections from a land use change model”.
- July 12th 2019. Poster presentation at Spatial Statistics 2019: Towards Spatial Data Science Conference. Poster titled “Improving crime rate standardization: a geographically weighted regression approach”.
- April 26th 2019. Presentation (12 minute talk) for the Graduate Student Presentation Spring 2019, at Dept. of Geography, UCSB, titled “Social & Environmental Determinants of Urban Crime: residential burglaries in Belo Horizonte, Brazil”.
- April 7th 2019. Paper presentation (15 minute talk) at AAG Annual Conference 2019. Paper session titled “Urban Crime Mapping and Analysis Using GIS II”, paper presentation titled “Social & Environmental Determinants of Urban Crime: residential burglaries in Belo Horizonte, Brazil”.
- April 9th 2017. Paper presentation (15 minute talk) at AAG Annual Conference 2017. Paper session titled “Approaches in Understanding Urban Precarity”, paper presentation titled “Is finer better? On the limits of crime data aggregation”.
- April 7th 2017. Presentation (15 minute) at Brown University, titled “Is finer better? On the limits of crime data aggregation”.
- March 30th 2016. Poster presentation at AAG Annual Conference 2016. Poster titled “Exploring the spatial-temporal relations between burglary and socioeconomic factors using GIS”.
- Oct 15th 2015. Geography Colloquium Presentation (15 minute talk) at University of California Santa Barbara, Department of Geography. Presentation titled “Crime and Income Inequality: a spatial simulation model”.

Teaching

- April. 2019-Jun. 2019. Teaching Assistant for Geog W12 “Maps and Spatial Reasoning” at the Department of Geography at UCSB.
- Jan. 2019-March. 2019. Teaching Assistant for Geog 191 “Optimization Methods for Geographic Problems” at the Department of Geography at UCSB.

- Sep. 2018-Dec. 2018. Teaching Assistant for Geog 140 “Historical Geography” at the Department of Geography at UCSB.
- April. 2018-Jun. 2018. Teaching Assistant for Geog 5 “People, Place, and Environment” at the Department of Geography at UCSB.
- Jan. 2018-March. 2018. Teaching Assistant for Geog 191L “Laboratory in Optimization Methods for Geographic Problems” at the Department of Geography at UCSB.
- April. 2017-Jun. 2017. Teaching Assistant for Geog W12 “Maps and Spatial Reasoning” at the Department of Geography at UCSB.
- Oct. 2015-Dec. 2015. Teaching Assistant for Geog 176A “Introduction to Geographical Information Systems” at the Department of Geography at UCSB.

Fellowships & Scholarships

- CAPES “Science without Borders Fellowship” for full PhD at University of California Santa Barbara. (Sep.2014-Aug.2018, ongoing).
- CNPq “RHAEE, SET-F” Scholarship for Graduate Research at SimWorx Engenharia, Pesquisa & Desenvolvimento, Brazil. (Sep.2013-Jul.2014).
- CNPq Scholarship for MS at University of Campinas, Brazil. (Jun.2011-Jun.2013).
- PIBIC/CNPq Scholarship for Undergraduate Research at CTI Renato Archer, Brazil. (Aug.2009-Dec.2010).
- PIBIC/CNPq Scholarship for Undergraduate Research at University of Campinas, Brazil. (Aug.2008-Jul.2009).

Skills

- Experience with R, Python, C/C++ and Matlab; familiar with Java, Javascript, Ruby, SQL and others.
- Experience with ArcGIS, QGIS and other mapping tools.
- Experience with mathematical programming solvers (FICO Xpress, OSQP) and languages (Xpress Mosel, R implementation of OSQP)
- Experience with Statistics, Data Science and Spatial Analysis, including regression models, cluster analysis, optimization methods (e.g., linear programming) and data visualization.
- Experience with Criminological theories, particularly Spatial and/or Geographical Theories (e.g., Crime Pattern Theory, Routine Activity Theory, Social Disorganization Theory) and Quantitative Analysis of Crime (e.g., estimating robust crimes rates to remove noise and error, testing the effect of socio-economic variables on crime rates, identifying trends, clusters/hotspots, etc.)
- Experience with Visual Computing (i.e., Computer Graphics, Image Processing, Computer Vision) concepts and tools.
- Experience with fundamentals of Computer Science: Algorithms, Data Structures, Networks.
- Notions of high performance computation, including GPU processing.

Languages

- Portuguese: native speaker.
- English: fluent.
- Spanish: advanced (reading), basic (speaking, writing).
- Japanese: basic, JLPT N5 certificate.
- French: basic.