Paulo Raposo, Ph.D.

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Personal Profile

I'm passionate about three things: **empathizing** with people and their problems, **applying geospatial technologies** to solve important problems, and **teaching others** how to do the same while applying their **critical thinking** skills. I'm intellectually **curious** and always interested in learning more. I'm **cooperative** and **candid** with my colleagues, always looking for ways in which we can benefit mutually.

Technical, Scientific, and Language Skills

- 25+ years experience with **GIS** and **Geomatics** (including ArcGIS, QGIS, GDAL), both desktop and Python APIs; GIS **software development**.

- 15+ years experience in **scientific research design**, **execution**, and **supervision**. **Complex problem solving** and work with **multidisciplinary teams**.

- 15+ years experience in **scientific and technical writing**, with peer-reviewed publication record, and expert **presentation and teaching skills**.

- 10+ years experience in **university-level teaching**, curriculum development, **skills training**; GIS, cartography, computer programming, geographic theory, **critical thinking**.

- Proficient in several **programming languages** (including Python, SQL, JavaScript, and Java) applied to geomatics, **data visualization**, **cartography**, spatial computing, web and app development, and image analysis. Proficient with **data science** software, graphical, and analysis software packages, libraries, and APIs: D3, R, Cesium, NASA WorldWind, Anaconda, matplotlib, numpy, networkx, MySQL, LATEX.

- Executing and teaching **project management techniques** (e.g., Agile, Kanban, PRINCE2, PM²).

- Fluent **English** (native tongue). Basic **Dutch**, **French**, and **Portuguese**.

Employment and Experience

Assistant Professor of Geovisualization, Department of Geo-information Processing (GIP), Faculty of Geo-Information Science and Earth Observation (ITC), The University of Twente. September 1st, 2019 to present.

Assistant Professor of Geographic Information Science, Department of Geography, University of Tennessee, Knoxville. August 15th, 2016 to July 31st, 2019. Tenure-Track.

Research Assistant for Dr. Cynthia Brewer, Department of Geography, Penn State University. Fall 2010 to Summer 2013. For three years I worked with Dr. Brewer, in collaboration with USGS cartographers, on the redesign of the US Topo topographic series. Several of Dr. Brewer's and my own design elements were implemented into US Topo.

Summer Intern at Esri, Cartographer, Summer 2010. I worked with Charlie Frye and Aileen Buckley as a member of the Mapping Center team at Esri in Redlands, California. My work involved several small projects in support of the Mapping Center's work, which was to inform and assist GIS users in the use of Esri software in making great maps.

Cartographer, Martin Prosperity Institute, University of Toronto, 2008 and 2009. I was the resident cartographer at the Martin Prosperity Institute in Toronto, part of the Rotman School of Management, University of Toronto. I was involved in map making for diverse projects undertaken by the Institute and my colleagues therein. As part of this work, I drew the maps for Dr. Richard Florida's Canadian edition of his book *Who's Your City?*.

Cartographer, Centre for Research on Inner City Health, St. Michael's Hospital, Toronto, 2008 and 2009. I worked with Dr. Kamran Khan in his research into the spread of diseases around the world by commercial airline passenger traffic. His project, then called BioDiaspora and now renamed and presented on-line at bluedot.global, seeks to better understand connectivity between world cities, so as to suggest wiser choices with regard to disease prevention. My work on the team was to design and draw the cartographic depictions of the analyses at various geographic scales using GIS.

Education

Ph.D., August 13th 2016, Geography, Department of Geography, The Pennsylvania State University. Specialization in Cartography. *Multiscale Raster Treatments for Map Generalization*. Advised by Prof. Cynthia A. Brewer.

MS, August 13th 2011, Geography, Department of Geography, The Pennsylvania State University. Specialization in Cartography. *Scale-Specific Automated Map Line Simplification by Vertex Clustering on a Hexagonal Tessellation*. Advised by Prof. Cynthia A. Brewer.

Honours B.Sc. With High Distinction, June 19th 2008, Archaeological Science, Department of Anthropology, with GIS Minor, Department of Geography and Program in Planning, University of Toronto.

Awards Received

Faculty ITC Teacher of the Year, 2023–2024.

Geo-Informatie Nederland (GIN) Cartography Prize 2020, for maps in the Journal of Maps publication "Epidemics and pandemics in maps - the case of COVID-19." Shared with co-authors Franz-Benjamin Mocnik, Paulo Raposo, Wim Feringa, Barend Köbben and Menno-Jan Kraak. Awarded November 24th, 2020.

E. Willard Miller Award for Best Ph.D. Paper in Geography, Department of Geography, Penn State University, 2016.

Cartography and Geographic Information Society (*CaGIS*) Ph.D. Scholarship Award, 2012.

Penn State Department of Geography Outstanding Research Assistant Award, 2012.

Cartography and Geographic Information Society (*CaGIS*) Master's Scholarship Award, 2010.

The Walter and Mary Tuohy Award in Arts and Science, University College, University of Toronto, 2007.

The Counseling Foundation of Canada Bursary for Volunteer Service, Victoria University, University of Toronto, 2007.

The Teetzel Traveling Award, University College, University of Toronto, 2006.

The Ruby M. Jolliffe Scholarship-Bursary, Victoria University, University of Toronto, 2006.

Outstanding Performance Award, Historical Geography of the Americas course, University of Toronto, 2005.

The University of Toronto Arbor Scholarship, 2000.

Selected Publications

Software

Raposo, P. and Brown, R. (2018). QTM Generator. Knoxville, TN: Paulo Raposo and Randall Brown. Open source, available from https://github.com/paulojraposo/QTM.

Raposo, P. (2016). FlowMaps. Knoxville, TN: Paulo Raposo. Open source, available from https://github.com/paulojraposo/FlowMaps.

Raposo, P. (2013). HexQuant. State College, PA: Paulo Raposo. Open source, available from https://github.com/paulojraposo/HexQuant.

Refereed Journal Articles

Fish, C. S., Roth, R. E., Raposo, P., Guidero, E. M., and Sui, Z. (2025). Why Conduct Cartographic Research: A Comparison of Cartographic Research Contributions in Four International Cartographic Association (ICA) Affiliated Journals. *The International Journal of Cartography*, 11(2), 190-215. https://doi.org/10.1080/23729333.2025.2475411.

Marçal Russo, L., Dane, G., Helbich, M., Ligtenberg, A., Filomena, G., Janssen, C. P., Koeva, M., Nourian, P., Patuano, A., Raposo, P., Thompson, K., Yang, S., and Verstegen, J. A. (2025). Do Urban Digital Twins Need Agents? *Environment and Planning B: Urban Analytics and City Science*. https://doi.org/10.1177/23998083251317666.

Lehtola, V. V., Koeva, M., Elberink, S. O., Raposo, P., Virtanen, J.-P., Vahdatikhaki, F., and Borsci, S. (2022). Digital Twin of a City: Review of Technology Serving City Needs. *International Journal of Applied Earth Observation and Geoinformation*, 114. https://doi.org/10.1016/j.jag.2022.102915.

Raposo, P. (2020). Variable DEM Generalization Using Local Entropy for Terrain Representation Through Scale. *The International Journal of Cartography*, 6(1), 99–120. https://doi.org/10.1080/23729333.2019.1687973.

Raposo, P., Brewer, C. A., and Sparks, Kevin. (2016). An Impressionistic Cartographic Solution for Base Map Land Cover with Coarse Pixel Data. *Cartographic Perspectives*, 83, 5–21. https://doi.org/10.14714/CP83.1351.

Raposo, P. (2013). Scale-Specific Automated Line Simplification by Vertex Clustering on a Hexagonal Tessellation. *Cartography and Geographic Information Science*, 40(5), 427–443. https://doi.org/10.1080/15230406.2013.803707.

Khan, K., Memish, Z. A., Chabbra, A., Liauw, J., Hu, W., Janes, D. A., Sears, J., Arino, J., Macdonald, M., Calderon, F., Raposo, P., Heidebrecht, C., Wang, J., Chan, A., Brownstein, J., and Gardam, M. (2010). Global Public Health Implications of a Mass Gathering in Mecca, Saudi Arabia During the Midst of an Influenza Pandemic. *Journal of Travel Medicine*, 17(2), 75–81. https://doi.org/10.1111/j.1708-8305.2010.00397.x.

Khan, K., Arino, J., Hu, W., Raposo, P., Sears, J., Calderon, F., Heidebrecht, C., Macdonald, M., Liauw, J., Chan, A., and Gardam, M. (2009). Spread of a Novel Influenza A (H1N1) Virus Via Global Airline Transportation. *New England Journal of Medicine*. July 9, 361(2), 212–214. https://www.nejm.org/doi/pdf/10.1056/NEJMc0904559.

Edited Book Sections

Raposo, P. (accepted, 2025) Gridding, Interpolation, and Contouring. The Geographic Information Science & Technology Body of Knowledge. John P. Wilson (Ed.).

Raposo, P. (2017) Scale & Generalization. The Geographic Information Science & Technology Body of Knowledge. (4th Quarter 2017 Edition) John P. Wilson (Ed.). doi: 10.22224/gistbok/2017.4.3. http://gistbok.ucgis.org/bok-topics/scale-and-generalization-1

Invited Presentations

Raposo, P. (March 27th, 2025). Experiences in Public Health Mapping. Presented to the Geographic Information Systems (GIS) for Public Health and Epidemiology class at KIT Institute, Amsterdam.

Raposo, P. (April 20th, 2023). Flow Maps, QTM, and XR Globes. Presented to The Netherlands eScience Center, Amsterdam.

Raposo, P. (January 22nd, 2018). Generalizing and Enhancing Geographic Structure for Cartographic Visualization, or, "Seeing a Pattern Here." Presented to the Department of Geography, McGill University, Montreal, Canada.