

# Vijay Lulla

Indiana University Purdue University Indianapolis  
Indianapolis, Indiana

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## Work experience

- **Indiana University Purdue University Indianapolis** Indianapolis, IN  
*Assistant professor* Aug 2013–Current
- **ESI (Environmental Solutions & Innovations, Inc.)** Cincinnati, OH  
*Geospatial Scientist* Oct 2012–Aug 2013
  - Primarily involved with automating GIS related tasks.
  - Responsible for developing database[s] that can be used for field data collection and GIS analysis coordination.
- **Indiana University Purdue University Indianapolis** Indianapolis, IN  
*Postdoctoral research fellow* 2010–2012
  - Supervisor: Daniel P. Johnson
  - Work on a NASA/ROSES-funded grant for geospatial modeling of heat related risks in urban cities.
  - Involves collection of satellite imagery data, processing satellite imagery data (georectification, image processing, and image classification).
  - Also includes collection, modification, and analysis of census data obtained from U.S. Census Bureau.
  - Responsible for programmatic generation of faculty evaluation reports (for every semester) for the School of Liberal Arts.
  - Provide formal/informal help with programming/database related issues to graduate students and colleagues.
- **ESI (Environmental Solutions & Innovations, Inc.)** Indianapolis, IN  
*GIS Consultant* Nov 2011–Nov 2011
  - Analysis of impact of a newly proposed wind-mill farm on bat-habitat/migration patterns.
  - Provided assistance with analysis which required integrating raster and vector data.
- **VIA (Vertical Integrated Applications)** Indianapolis, IN  
*GIS Consultant* Nov 2010–Mar 2011
  - Helped with organizing GIS data to be used in Spillman geobase used by Johnson County Public Safety and Communications Board's Record Management System.
  - Provided customized scripts (python/perl) to meet data conformity.

## Education

- **Indiana State University** Terre Haute, IN  
*Ph.D. Geography* 2005–2010
  - Advisors: Ryan Jensen and Paul Mausel
  - Committee: James Speer, Susan Berta, Perry Hardin, Geoffrey Exoo
  - Title: Neural network classification of hyperspectral imagery for urban environments: a case study
- **Indiana State University** Terre Haute, IN  
*M.A. Geography* 2002–2005
  - Advisor: Ryan Jensen
  - Committee: Paul Mausel, James Speer
  - Thesis: Biomass estimation using statistical and neural network analysis of ASTER data.
- **Maharaja Sayajirao University** Baroda, India  
*B.E. Electrical Engineering* 1996–2000

## Awards

- Benjamin J. Moulton Ph.D. Award 2006.
- Outstanding Service Award, Department of Geography, Geology, and Anthropology, Indiana State University. 2007

## Teaching Experience

- **Programming and databases for geoprocessing** Indiana University Purdue University Indianapolis  
*Created new course/Instructor* *Spring 2016, 2017*
- **Advanced Remote Sensing** Indiana University Purdue University Indianapolis  
*Instructor* *Spring 2014-2017*
- **Advanced Geographic Information Science** Indiana University Purdue University Indianapolis  
*Instructor* *Spring 2014*
- **Environmental Remote Sensing** Indiana University Purdue University Indianapolis  
*Instructor* *Fall 2012-2017*
- **Computer Cartography** Indiana University Purdue University Indianapolis  
*Instructor* *Fall 2011-2016*
  - Besides teaching computer cartography, discussed GIS and database concepts.
  - Also introduced students to many advanced statistical (R/matlab) and visualization (Processing/OpenGL/ParaView) tools actively being used by researchers.
- **Physical Geography Lab Instructor** Indiana State University  
*Graduate Teaching Assistant* *Fall 2007*
  - Taught introductory physical geography lab which is a part of general education requirement.
- **Remote Sensing** Indiana State University  
*Graduate Teaching Assistant* *Fall 2005*
  - Assisted in lab for Remote Sensing course.
  - Helped students with all aspects of remote sensing data analysis.
- **Guest Lectures**  
Lecture about India for World Regional Geography,
  - November 4, 2008
  - April 19, 2009

## Research Experience

- **Graduated students**
  - Zachary Vavra (Masters 2015)
  - Miranda Hancock (Masters 2015)
- **NASA/ROSES Grant** Indiana University Purdue University Indianapolis  
*Postdoctoral Research Fellow* *Fall 2010–Fall 2012*
  - Modeling heat related risks to vulnerable populations in urban cities (primarily involves coding R and some python).
  - Development of web interface for one of the tools that can be used by EMS personnel (primarily involves programming in php, python, and javascript).
  - Collection/organization of relevant data. For. e.g. satellite imagery data, Census data, health related data.
  - Developing a schema and corresponding implementation for consistent storage of data required for projects.

- Survey analysis of faculty evaluations data for the School of Liberal Arts (primarily using R and Stata).
- **REASoN Grant** Indiana State University  
Fall 2007–Spring 2010
  - *One of primary materials developer*
    - <http://seros.us/moodle/>
    - Created web based remote sensing teaching material for use in classroom.
    - Familiarity with web frameworks, databases and presenting remote sensing educational material.
- **Hyperspectral data collection** Indiana State University  
Summer of 2006 & 2007
  - *Research Assistant*
    - Assisted in collecting hyperspectral data using AISA+ sensor.
    - Leaf Area Index (LAI) field data collection.
    - Rectification of the data using vendor provided ENVI software module.
    - Wrote a program in python to correct the errors in raw data.
    - Wrote some IDL programs for exploratory analysis of hyperspectral data.
- **Amazon Information System** Indiana State University  
Fall 2005–Fall 2007
  - *Secondary Developer*
    - Secondary developer for Amazon Information System for use in LBA (Large Scale Biosphere and Atmosphere Experiment in Amazonia, Brazil).
    - Dealt with different satellite data formats at different resolutions.
    - Worked on scaling issues, neural network classifier.
- **Educational Multi-media CD-ROM** Indiana State University  
Jan 2002–Fall 2005
  - *One of the primary developers*
    - Programming for multimedia CD-ROM used in Brazilian colleges to introduce basic remote sensing principles.
    - “Lingo” programmer: Multimedia (Macromedia Director) programming.

## Publications

- **Vijay Lulla**, Owen J. Dwyer. (revision). Racial segregation in Indianapolis, 1990-2010. *Journal of Indiana Academy of Social Sciences*.
- Perry Hardin, **Vijay Lulla**, Ryan Jensen, John Jensen (2018). Small Unmanned Aerial Systems (sUAS) for Environmental Remote Sensing: Challenges and Opportunities revisited. *GIScience & Remote Sensing* doi: <https://doi.org/10.1080/15481603.2018.1510088>
- Fabio Famoso, Jeffrey S. Wilson, Pietro Monteforte, Rosario Lanzafame, Sebastian Brusca, and **Vijay Lulla** (2017) Measurement and modeling of ground-level ozone concentration in Catania, Italy using biophysical remote sensing and GIS. *International Journal of Applied Engineering Research* 12(21):10551-10562
- **Lulla V.** and A. Banerjee (2016) Some database concepts for use in geographic analysis. David. Cowen (Ed.), *STEM and GIS in Higher Education*. (pp 295-309) ESRI Press. ISBN: 9781589484481
- **Lulla V.** and R. Jensen (2016) Best practices for Urban hyperspectral remote sensing data acquisition and processing. Gatrell, J., Jensen R., Patterson M., & Hoalst-Pullen N. (eds), *Urban sustainability: Praxis & Place*. (pp 43-54) Heidelberg: Springer. ISBN: 978-3-319-26218-5
- **Vijay Lulla**, Austin Stanforth, Natasha Prudent, Daniel Johnson, and George Luber. (2015) Modeling Vulnerable Populations in the Global Context of a Changing Climate. Ahn Roy, Burke Thomas, McGahan Anita M. (Eds.), *Innovations for Healthy Urbanization*. (pp 193–208). Springer. ISBN: 978-1-4899-7597-3.
- Daniel P. Johnson, J. Jeremy Webber, Kavya Urs Beerval Ravichandra, **Vijay Lulla**, Austin C. Stanforth. (2014) Spatiotemporal variations in heat-related health risk in three Midwestern US cities between 1990 and 2010. *Geocarto International* 29(1):65-84 doi: 10.1080/10106049.2013.799718
- D. P. Johnson, **V. Lulla**, and A. C. Stanforth. (2013) Intra-urban variations in vulnerability associated with extreme heat events in relationship to a changing climate. In Sara Pryor’s (Ed), *Climate change in the midwest: impacts, risks, vulnerability, and adaptation*. (pp. 134–145). Indiana University Press.

- Johnson, D. P., Stanforth, A. C., **Lulla, V.**, Luber, G. C. (2012) Developing an applied extreme heat vulnerability index. *Applied Geography* 35(1-2):23-31.
- Johnson, D. P., **Lulla, V.**, Stanforth, A. C., Weber, J. (2011) Remote sensing of heat-related risks: the trend towards coupling socioeconomic and remotely sensed data. *Geography Compass* 5(10):767-780.
- **Lulla, V.** (2009) Hyperspectral applications in urban geography. In J. D. Gatrell & R. R. Jensen (Eds.), *Planning and socioeconomic applications* (Vol. 1, pp. 79–86). Springer.
- Jensen, R. R., M. W. Jackson, and **V. Lulla** (2008) Single line correction method to remove aircraft roll errors in hyperspectral imagery. *Journal of Applied Remote Sensing* 2:023529
- Jensen, R. R., P. J. Hardin, M. F. Bekker, D. A. Farnes, **V. Lulla**, and A. Hardin (2009) Modeling Urban Leaf Area Index with AISA+ Hyperspectral Data. *Applied Geography*. 29(3), 320–332
- Dando, W. A. and **V. Lulla**. (2007) World agriculture and food provisioning. In William A. Dando's *Climate change and variations: A primer for teachers*. Vol. I. Washington, D.C: National Council for Geographic Education, pp. 157–165.
- Jensen, R. R., G. Yu, P. Mausel, **V. Lulla**, E. Moran and E. Brondizio (2004). An integrated approach to Amazon research – the Amazon Information System. *Geocarto International* 19(3):55–59
- Gonser, R., R. R. Jensen, **V. Lulla**, and E. McCluskey. 2007. Deer-vehicle collisions in western Indiana. *21<sup>st</sup> Biennial Workshop on Aerial Photography, Videography, and High Resolution Digital Imagery for Resource Assessment*. May 15–17. Terre Haute, Indiana.

## Presentations

- **Vijay Lulla**, and Owen J. Dwyer III. 2017. *Investigating racial segregation in Indianapolis using Kernel Density Estimation*. Indiana Academy of Social Science, Crawfordsville, IN. October 13, 2017.
- Banerjee A., and **Lulla, V.**. 2017. *The Statistical Mechanics of Urban Road Networks under Stress*. NetSci 2017, Indianapolis, IN. June 19, 2017.
- **Vijay Lulla**. 2016. *Comparison of programming languages for geoprocessing*. Association of American Geographers Annual Meeting, San Francisco, CA. March 29–April 2.
- **Vijay Lulla**, Aniruddha Banerjee. 2015. *Some ideas from Open Source worth embracing in GIS*. Association of American Geographers Annual Meeting, Chicago, IL. 20–24 April.
- **Vijay Lulla**. 2014. *Levee identification from LiDAR data*. Association of American Geographers Annual Meeting, Tampa, FL, 8–12 April.
- James H. Speer, Kristen de Graauw, Dorothy J. Rosene, Stephen P. Aldrich, and **Vijay O. Lulla**. 2014. *Pandora Moth as an Example of a Species-Wide Network for Analysis of Insect Outbreaks*. 9<sup>th</sup> International Conference on Dendrochronology, Melbourne, Australia, 13–17 January.
- D. P. Johnson, Stanforth, A. C., **V. Lulla** Identifying heat vulnerable populations across an urban environment, a case study of the 1995 Chicago, IL extreme heat event. Centers for Disease Control and Prevention, Atlanta, GA. May 2011. Research Update presentation.
- Stanforth, A. C., D. P. Johnson, **V. Lulla**, and J. Webber III. Relating socio-spatial variables to heat induced mortalities in Chicago, IL during the 1995 extreme heat event. ICEPHI Symposium. Indianapolis, IN. September 2010. Poster presentation.
- Speer, J. H. and **V. Lulla**. 2009. *Pandora Moth outbreaks recorded in ITRDB chronologies across the entire range of Ponderosa Pine in Western United States*. Association of American Geographers Annual Meeting, Las Vegas, NV, 22–27 March.
- Jensen, R. R., M. W. Jackson, and **V. Lulla**. 2009. *Single line correction method to remove aircraft motion errors in AISA+ hyperspectral imagery*. Association of American Geographers Annual Meeting, Las Vegas, NV, 22–27 March.
- Yu, G., R. R. Jensen, P. W. Mausel, **V. Lulla**, E. S. Brondizio, and E. F. Moran. 2004. *GIS smart client: sharing spatial data and knowledge through Internet by standards*. American Society for Photogrammetry and Remote Sensing Annual Conference, Denver, CO, 23–28 May.
- Yu, G., R. R. Jensen, P. W. Mausel, **V. Lulla**, E. S. Brondizio, and E. F. Moran. 2004. *A distributed spatial information system: web service and its implementation*. Association of American Geographers Annual Meeting, Philadelphia, PA. 14–19 March.

## Memberships

- Association of American Geographers (AAG)
- Indiana Academy of Science (IAS)
- Indiana Academy of Social Science (IASS)
- IndyR User Group

## Service

- Served in a committee to develop online GIS course. August–December 2013.
- Refereed an article for Geocarto International. November 2013.
- Volunteered for regional competition of 2012 National Geographic Bee conducted by the National Geographic Society at Indiana University Purdue University Indianapolis on March 30, 2012.
- Volunteered for regional competition of 2011 National Geographic Bee conducted by the National Geographic Society at Indiana University Purdue University Indianapolis on April 01, 2011.

## Skills

- Programming Languages and Databases
  - **Expert:** C, Ocaml, Lisp, Python, Ruby, SQL, PostgreSQL[Postgis]
  - **Intermediate:** J, C#, F#, Factor, Haskell, Lua, C++, Java, Perl, IDL, EML, PHP, Erlang, MySQL
- Markup Languages
  - **Expert:** T<sub>E</sub>X/L<sup>A</sup>T<sub>E</sub>X, (X)HTML/CSS
  - **Intermediate:** XML/XSLT, ConT<sub>E</sub>Xt
- Statistics and Remote Sensing/GIS related Software
  - **Expert:** Erdas Imagine, ENVI, ArcGIS, R, MultiSpec
  - **Intermediate:** Numpy/Scipy, Stata, Statistica, Matlab, Mathematica, Maptitude, Quantum GIS, GRASS, NCL (NCAR Command Language)
- Miscellaneous tools
  - **Expert:** make/cmake/omake, git, shell scripting, grep/sed/awk, Linux/Unix
  - **Intermediate:** Povray, ParaView, Processing, Moodle, OpenMPI
- Fairly conversant with Office subsystem.