Gautam Thakur ***Curriculum vitae***

CONTACT INFORMATION

Oak Ridge National Laboratory,
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Oak Ridge, Tennessee
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PROFESSIONAL AND RESEARCH CAREER

2016-, **Research Scientist**,
Urban Dynamics Institute,
Oak Ridge National Laboratory, UT-Battelle, LLC, Oak Ridge, TN, USA

2015-, **Research Scientist**,
The Geographic Information Science & Technology Group,
Oak Ridge National Laboratory, UT-Battelle, LLC, Oak Ridge, TN, USA

2013-2015, **Postdoctoral Research Associate**,
The Computational Data Analytic Research Group,
Oak Ridge National Laboratory, UT-Battelle, LLC, Oak Ridge, TN, USA

2007-2012, **Research Assistant**,
University of Florida, Gainesville, Florida USA

2012, **Lab Research Associate**,
Disney Research, ETH, Zürich, Switzerland

2011, **Research Intern**,
Deutsche Telekom Research Laboratories, Berlin, Germany

2010, **Research Intern**,
Deutsche Telekom Research Laboratories, Berlin, Germany

2004-2006, **Member Technical Staff**,
HCL Technologies Limited, Noida, India

RESEARCH DOMAIN

Population dynamics, geographic information systems, urban sensors, network science, transportation simulation and modeling

EDUCATION

2006-2012, **Doctor of Philosophy (Ph.D.)**.
The Department of Computer and Information Science and Engineering,
University of Florida, Gainesville, Florida USA.

- *Dissertation Title:* Data-driven Mobility Modeling in Large-scale Networks
- *Adviser:* Prof. Ahmed Helmy. *Co-adviser:* Prof. Pan Hui.
- *Committee:* Prof. Sartaj Sahni, Prof. My T. Thai, Prof. Alin Dobra, Yuguang Fang
- *Area of Study:* Population dynamics, mobility modeling, traffic engineering, data-driven spatio-temporal modeling and simulation.

1998-2004, **Master of Computer Applications (M.C.A.)**.
International Institute of Professional Studies, Devi Ahilya University, India.

- *With Honors* in Computer Applications.
- Area of Study: Computer networks and database management systems.

HONORS AND AWARDS

- Invitational member, Urban Dynamics Institute, Oak Ridge National Laboratory. Members were nominated by the division directors given the strong relevance and impact of ones research on the mission of the institute, 2015
- Invited to speak at NSF DriveSense workshop, Norfolk, VA, 2014
- Research Chair, Oak Ridge Postdoctoral Association, ORNL, 2014

- ORNL Director awarded certificate for exceptional service to ORNL postdoctoral association, 2014
- Research selected for the exascale GPU Hackathon, 2015
- Research selected for 2nd round of Innovations in American Government Awards, 2014
- Technology licensed: Gautam S. Thakur. EdREC: Design and Development of Adaptive Platform for Scaling- up Flipped Mastery Learning. Department of Energy, Copyright Document Number 90000015
- IEEE Communication Society InternetTC Best Paper 2013 award (Awarded in 2015)
- ACM SigSpatial top three best papers (Vision), 2015
- Best paper award at ACM SIGSPATIAL, IWCTS, 2013
- Recipient of prestigious ERCIM Alain Bensoussan Fellowship-The European Research Consortium for Informatics and Mathematics, Nov 2012. (Declined)
- Best Employee Award "BRAVO" for Excellence in Work, HCL Technologies, 2005

Technical Skills

Computer Programming:

- Java, Spring.io, C, C++, PHP, UNIX shell scripting (including POSIX.2), GNU Make/Ant, SQL, Matlab, R, Maven.

Tools and Applications:

- Weka, RapidMiner, D3, Gephi, Cytoscape, Pajek, Graphviz, Social API (Facebook, Twitter, Google), Google Maps, Hadoop, Hive, HSQL, SVN, and Clearcase.

Operating Systems and Databases:

- Microsoft Windows family, Apple OS X, Android, Linux, AIX, Solaris, and other UNIX variants, MySQL, Oracle 11g, Active Directory

Productivity Applications:

- TEX (LATEX, BIBTEX), Vim, Eclipse

Research Grants

R4. 2015, *Real-time Urban Activity Monitoring Using Pervasive Sensor Network*, Lab directed research and development under Science and Informatics for Energy and Urban Infrastructure. (Co-PI)

R3. 2014, *UrbanSmart: Design and Development of Adaptive Urban Dynamics from Emergent Phenomenon discovered through the Mapping of Heterogeneous Data-Sources*, Data grant by Orange under D4D challenge (Co-PI)

R2. 2013-2016, *MobiBench: Benchmarking Mobility Models for Simulation and Design of Future Networks* (P.I. Ahmed Helmy). Awarded Amount: $377,466.00

R1. 2013, *Epidemic Model for Data Propagation*, Data grant by Orange under D4D challenge (Co-PI)

Technology Licensing

Gautam S. Thakur. EdREC: Design and Development of Adaptive Platform for Scaling-up Flipped Mastery Learning. *Department of Energy, Copyright Document Number 90000015*

Inventions

I3. Gautam S. Thakur. PlanetSense: A Real-time Streaming and Spatio-Temporal Analytics Platform for Gathering Geospatial Intelligence from Open Source Data. *Department of Energy, Invention Disclosure 201603769, DOE S-138,418,.* 2016.

I2. Gautam S. Thakur. Curating Transient Population in Urban Dynamics System. *Department of Energy, Invention Disclosure 201603770, DOE S-138,419,.* 2016.

I1. Gautam S. Thakur, Mallikarjun Shankar, and Jack C. Schryver. Curated High-Resolution Data sets for Modeling of a Healthcare System. *Department of Energy, Invention Disclosure 201403331, DOE S-124,951,.* 2014.

Book Chapters

B2. Gautam S. Thakur, Kelly M. Sims, Huina Mao, Jesse O. Piburn, Kevin A. Sparks, Eric M. Weber, Budhendra L. Bhaduri. Utilizing geo-located sensors and social media insight for research in population dynamics and land classification. *Human Dynamics Research in the Changing World*. 2017 (Under Revision).

B1. Gautam S. Thakur. Community Detection in Biological Networks. *Applied Statistics for Network Biology: Methods in Systems Biology (p. 478) John Wiley & Sons*. 2011.

Journal Publications

J6. Huina Mao, Yong-Yeol Ahn, Budhendra L. Bhaduri and Gautam S. Thakur.Improving land use inference by factorizing mobile phone call activity matrix. *Journal of Land Use Science*, 2017 (Under Revision)

J5. Robert Stewart , Marie Urban, Samantha Duchscherer, Jason Kaufman, April Morton, Gautam S. Thakur, Jesse Piburn, Jessica Moehl.A Bayesian machine learning model for estimating building occupancy from open source data. *Springer Natural Hazards*, 2016

J4. Gautam S. Thakur, Pan Hui, and Ahmed Helmy. The Structure and Traffic Flow Anatomy of the Planet-Scale Urban Vehicular Mobility. *Springer Special Issue on Networking Science*, 2013

J3. Gautam S. Thakur, Udayan Kumar, Wei-Jen Hsu, and Ahmed Helmy. Gauging Human Mobility Characteristics and its Impact on Mobile Routing Performance. *International Journal of Sensor Networks*. 2011.

J2. Udayan Kumar, Gautam S. Thakur, and Ahmed Helmy. Proximity based Trust Advisor using Encounters for Mobile Societies: Analysis of Four Filters. *Journal on Wireless Communications and Mobile Computing*. 2011.

J1. Gautam S. Thakur, R. Tiwari, M.T. Thai, S.-S. Chen, and A.W.M. Dress. Detection of Local Community Structures in Complex dynamic Networks with Random Walks. *IEEE/IET Journal on System Biology*. 2009.

Conference Publications

C29. Gautam Thakur, Teja Kuruganti, Stephen Killough, Miljko Bobrek, James Nutaro, Cheng Liu, Wei Lu. Real-time Urban Population Monitoring Using Pervasive Sensor Network. In: *Proceedings of the 23rd ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems*. 2016

C28. Kevin Sparks, Roger Li, Gautam Thakur, Robert Stewart, Marie Urban. Facility Detection and Popularity Assessment from Text Classification of Social Media and Crowdsourced Data. In: *Proceedings of the 10th Workshop on Geographic Information Retrieval, ACM SIGSPATIAL*. 2016

C27. Gautam Thakur, Kevin Sparks, Robert Stewart, Marie Urban. Demo: Gathering Geospatial Intelligence from Crowd-sourced and Social-media Data. In: *Proceedings of the 23rd ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems*. 2016

C26. Gautam Thakur, Kevin Sparks, Robert Stewart, Marie Urban, Budhendra Bhaduri. Curating Transient Population in Urban Dynamics System. In: *GeoSocial: Social Media and GIScience workshop, at the Ninth International Conference on Geographic Information Science*. 2016

C25. Gautam Thakur, Kevin Sparks, Robert Stewart, Marie Urban, Budhendra Bhaduri. Landuse Classification and Occupancy Estimation from Fine Grained Social Media Analysis. In: *The Ninth International Conference on Geographic Information Science*. 2016

C24. Gautam S. Thakur, Budhendra L Bhaduri, Jesse O Piburn, Kelly M Sims, Robert N Stewart, Marie L Urban. Gathering Geo-spatial Intelligence from Crowd and Open Sourced Data. In: *American Association of Geographers' Annual Meeting*. 2016

C23. Gautam S. Thakur The Efficacy of Applying Open and Crowd Source Data in Urban Dynamics Research. In: *Conference on Data Analysis*. 2016

C22. Gautam S. Thakur, B.H. Park Ozgur Ozmen, and Jack Schryver, Mallikarjun Shankar, and Gil Weigand Synthetic Data Generation for High-Fidelity HPC Healthcare Simulation: Beneficiary-Provider Network Example. In: *Spring Simulation Multi-Conference*. 2015

C21. Gautam S. Thakur, Pan Hui, Ahmed Helmy. Evidence of Long Range Dependence and Self-similarity in Urban Traffic Systems. In: *ACM SIGSPATIAL '15: Proceedings of the 22nd ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems*. 2015

C20. Gautam S. Thakur, Budhendra L Bhaduri, Jesse O Piburn, Kelly M Sims, Robert N Stewart, Marie L Urban. PlanetSense: A Real-time Streaming and Spatio-temporal Analytics Platform for Gathering Geo-spatial Intelligence from Open Source Data. In: *ACM SIGSPATIAL '15: Proceedings of the 22nd ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems*. 2015 [*ACM SIGSPATIAL Best top three Papers*]

C19. Robert Stewart, Jesse Piburn, E Webber, Marie Urban, April Morton, Gautam Thakur, Budhendra Bhaduri. Can social media play a role in developing building occupancy curves for small area estimation?. In: *Proc. 13th Internationl Conference in GeoComputation*. 2015

C18. Kelly M. Sims, Eric. M. Weber, Budhendra. L. Bhaduri, Gautam S. Thakur, David. R. Resseguie. Application of Social Media Data to High Resolution Mapping of a Special Event Population. In: *Proc. 13th Internationl Conference in GeoComputation*. 2015

C17. Seung-Hwan Lim, Gautam S. Thakur, James Horey. Analyzing reliability of virtual machine instances with dynamic pricing in the public cloud. In: *High-Performance Grid and Cloud Computing Workshop (with IPDPS)*. 2014

C16. Mohammed M Olama, Gautam S. Thakur, Allen W McNair, Sreenivas R Sukumar. Predicting student success using analytics in course learning management systems. In: *SPIE Sensing Technology Applications*. 2014

C15. Gautam S. Thakur, Mohammed M Olama, Allen W McNair, Sreenivas R Sukumar, Scott Studham. Towards Adaptive Educational Assessments: Predicting Student Performance using Temporal Stability and Data Analytics in Learning Management Systems. In: *Data Mining for Educational Assessment and Feedback (KDD ASSESS 2014)*. 2014

C14. Jan-Mou Li, Andreas Malikopoulos, Gautam S. Thakur, and Raju Vatsavai. Analytics For Distracted Driver Behavior Modeling in Dilemma Zone. In: *Transportation Research Board 93rd Annual Meeting, Washington, D.C., DC, USA, 20140112, 20140116*. 2014

C13. Damien Fay, Gautam S. Thakur, Pan Hui, and Ahmed Helmy. Knowledge Discovery and Causality in Urban City Traffic: A study using Planet Scale Vehicular Imagery Data. In: *The Sixth ACM SIGSPATIAL International Workshop on Computational Transportation Science*. 2013. [*ACM SIGSPATIAL Best Paper award*]

C12. Gautam S. Thakur, Pan Hui, and Ahmed Helmy. Data-driven study of urban infrastructure to enable city-wide ubiquitous computing. In: *Proceedings of the 2nd International Workshop on Big Data, Streams and Heterogeneous Source Mining: Algorithms, Systems, Programming Models and Applications, BigMine. ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*. 2013.

C11. Gautam S. Thakur, Pan Hui, and Ahmed Helmy. On the Existence of Self-similarity in Planet-scale Vehicular Networks. In: *The 9th IEEE International Wireless Communications and Mobile Computing Conference*. 2013.

C10. Gautam S. Thakur, Pan Hui, and Ahmed Helmy. Modeling and Characterization of Vehicular Density at Scale. In: *The 16th IEEE International Global Internet Symposium*. 2013.

C9. Gautam S. Thakur and Ahmed Helmy. COBRA: A Framework for the Analysis of Realistic Mobility Models. In: *The 16th IEEE International Global Internet Symposium*. 2013. [*IEEE Comsoc ITC Best Paper award of the year*]

C8. Gautam S. Thakur, Pan Hui, and Ahmed Helmy. A Framework for Realistic Vehicular Network Modeling using Planet-scale Public Webcams. In: *ACM International Workshop on Hot Topics in Planet-Scale Measurement(Mobisys - HotPlanet)*. 2012.

C7. Gautam S. Thakur, Pan Hui, and Ahmed Helmy. Modeling and Characterization of Urban Streets' Vehicular Mobility using Web Cameras. In: *IEEE International Conference on Computer Communications workshop on Network Science for Communication Networks (Infocom - NetSciCom)*. 2012.

C6. Gautam S. Thakur, Pan Hui, and Ahmed Helmy. Spatial and Temporal Analysis of Planet Scale Vehicular Imagery Data. In: *IEEE International conference on Data Mining workshop on Spatial and Spatio-Temporal Data Mining (ICDM - SSTDM)*. 2011.

C5. Gautam S. Thakur, Udayan Kumar, Ahmed Helmy, and Wei-Jen Hsu. On the Efficacy of Mobility Modeling for DTN Evaluation: Analysis of Encounter Statistics and Spatio-Temporal Preferences. In: *IEEE International Wireless Communications and Mobile Computing Conference (IWCMC)*. 2011.

C4. Gautam S. Thakur, Ahmed Helmy, and Wei-Jen Hsu. Similarity analysis and modeling in mobile societies: The missing link. In: *ACM MobiCom Workshop on Challenged Networks (CHANTS)*. 2010.

C3. Gautam S. Thakur, Mukul Sharma, and Ahmed Helmy. SHIELD: Social sensing and Help In Emergency using mobiLe Devices. In: *IEEE Global Telecommunications Conference (GLOBECOM)*. 2010.

C2. Udayan Kumar, Gautam S. Thakur, and Ahmed Helmy. PROTECT: proximity-based trust-advisor using encounters for mobile societies. In: *IEEE International Wireless Communications and Mobile Computing Conference (IWCMC)*. 2010.

C1. Gautam S. Thakur. CINORA: Cell Based Identification of Node Replication Attack in Wireless Sensor Networks. In: *IEEE International Conference on Communications Systems (ICCS)*. 2008.

Technical Reports

T1. Jan-Mou Li, Andreas Malikopoulos, Gautam S. Thakur, Raju Vatsavai. Analytics For Distracted Driver Behavior Modeling in Dilemma Zone. In: *Human Factors and Statistical Modeling Lab, 2014 TRB Data Contest.* 2013.

Teaching Experience

2008-2012, **University of Florida**, Gainesville, Florida USA

- CEN 3031: Software Engineering
  - Fall 2012, Spring 2012, Fall 2011, Spring 2010, Fall 2010, Spring 2009.
  - Supervised discussion sections for 5 hours per week, where undergraduate students learn to incorporate essential software engineering processes in projects.
  - Drafted document templates based on IEEE recommended practice for software development life cycle, supplementary course material, including a course web site at `http://www.cise.ufl.edu/class/cen3031fa11`
  - Advocated the use of Collaboration and Learning Environment (**Sakai**) for enhanced teaching and research experience.
  - Volunteered lectures while instructor on travel.
- CNT 5106C: Computer Networks
  - Fall 2012, Fall 2009.
  - Accomplished managing large class (130 students).
  - Augmented academic honesty with the use of anti-plagiarism tools (TurnItIn).
  - Volunteered lectures while instructor on travel.
- CIS 6930MN: Mobile Networking Laboratory
  - Spring 2008.
  - Designed unbiased scenarios and experiments for outdoor encounter-based networking and wireless measurement activities.
  - Wrote energy efficient scripts for bluetooth and wifi access point scanning on handheld devices (Nokia 810).
  - Volunteered lectures while instructor on travel.

2003, **IBM Academic Initiative**

- Linux System Administration and Programming.
  - Designed course syllabus, homework incorporating essentials of linux system administration and programming.
  - Facilitated lab experiments to augment theoretical teaching.
  - Achieved graduate level teaching appointment.

Professional Services

Reviewed publications for following Journals

- IEEE Transactions on Vehicular Technology
- Elsevier Computer Communications
- Physical Sensors
- IEEE Transactions on Mobile Computing (TMC)
- Elsevier Case Studies on Transport Policy
- Transactions in GIS
- ISPRS International Journal of Geo-Information

Reviewed publications for following Conferences

- ACM SIGSPATIAL Mobile Entity Localization, Tracking and Analysis (MELT)
- ACM SigSpatial International Conference on Advances in Geographic Information Systems
- ACM SIGSPATIAL International Workshop on Computational Transportation Science

Technical Program Committee Member (Conference and Workshops)

- ACM International Conference on Advances in Geographic Information Systems (SigSpatial)
- IEEE ICCCN Conference
- ACM Mobile Entity Localization, Tracking and Analysis workshop
- IEEE HotPlanet Conference
- ACM SIGSPATIAL International Workshop on Computational Transportation Science

Chair/Session chair

- ACM SigSpatial International Conference on Advances in Geographic Information Systems
- Oak Ridge National Laboratory Postdoctoral Association
- ACM HotPlanet Conference
- ACM International Workshop on Computational Transportation Science

Workshop Chair and Organizer

- I have organized 9th ACM SIGSPATIAL International Workshop on Computational Transportation Science in 2016. I also served as the Chair of this workshop. I was involved in review process of all the submitted papers in this workshop as well coordinated final decisions to select or reject submitted papers in the final workshop program.

Mentoring

- Supervise post-master and post-doctoral candidates.

Member

- Full Member, Sigma Xi
- Professional Member, The Institute of Electrical and Electronics Engineers
- Individual Membership, Association of American Geographers
- Professional Member, Association for Computing Machinery
- The American Association for the Advancement of Science (AAAS)

News Media Coverage

M5. PlanetSense: Utilizing Open Source Data for Geospatial Intelligence, Simple Ways to do More with Your Scientific Data in GovLoop (GovLoop is the "Knowledge Network for Government" - the premier social network connecting over 250,000 federal, state, and local government innovators), 2016

M4. Mapping Human Population Trends, United States Geospatial Intelligence Foundation (USGIF), 2016

M3. Why Science? My research was covered by ORNL in their world-famous Review magazine, 2015

M2. Flipped Classroom Method Wins Attention as One of the World's Most Innovative Teaching Methods, 2014

M1. U.S. researchers are beta testing software to help teachers personalize lessons for greater student success, Plante Moran, 2014