# Marta C. González

*Curriculum Vitæ (September 29, 2018)*


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## BIO

Marta C. Gonzalez is Associate Professor of City and Regional Planning at the University of California, Berkeley, and a Physics Research faculty in the Energy Technology Area (ETA) at the Lawrence Berkeley National Laboratory (Berkeley Lab). With the support of several cities, companies, and foundations, her research team develops computer models to analyze digital traces of information mediated by devices. They process this information to manage the demand in urban infrastructures in relation to energy and mobility. Her recent research uses billions of mobile phone records to understand the appearance of traffic jams and the integration of electric vehicles into the grid. Smart meter data records to compare the policy of solar energy adoption. Credit card transactions to identify habits in spending behavior. Prior to joining Berkeley, Marta worked as an Associate Professor of Civil and Environmental Engineering at MIT, a member of the Operations Research Center and the Center for Advanced Urbanism. She is a member of the UC Berkeley Institute of Transportation Studies. Also participates in the scientific council of technology companies such as Gran Data, PTV and the Pecan Street Project consortium. Her mission is to put science and technology at the service of social well being.

## APPOINTMENTS

**Associate Professor** 2018-present
*UC Berkeley,*
*Department of City and Regional Planning*

- Complex systems, urban computing, network science: modeling interactions of people with the built, the natural environment and their social networks
- Designing of urban solutions related to transportation, energy and the environment
- Mining data from communication activities via machine learning and statistical physics techniques
- Teaching Network Science, Urban Mobility Models, Statistics and Data Analysis
- Member of the UC Berkeley Institute of Transportation Studies

**Faculty Scientist, Physics** 2017-present
*Lawrence Berkeley National Laboratory,*
*Area: Energy Technologies*
*Division: Energy Analysis & Environmental Impacts*

**Associate Professor** 2015-2017
*Massachusetts Institute of Technology,*
*Department of Civil and Environmental Engineering*
*Center for Advanced Urbanism*
*Operations Research Center*

**Assistant Professor** 2009-2015
*Massachusetts Institute of Technology,*
*Department of Civil and Environmental Engineering*
*Engineering Systems Division*

**Postdoctoral Research Associate** 2006-2009
*Northeastern University and University of Notre Dame*

- Research on human mobility patterns and social networks
- Member of the Center for Complex Networks Research (Barabási Lab)

**Researcher** 2000-2002
*Intevep, Oil Research Institute of PDVSA (Venezuelan Oil Company)*

- Rock fluid interactions, multi-phase flow in porous media
- Black-oil Simulation
- Member of the team for development and tests of Intevep's oil simulator

## EDUCATION

**PhD Physics** 2003-2006
*Stuttgart Universität, Germany*
"Contact Networks of Mobile Agents and Spreading Dynamics"
Thesis adviser: Hans Herrmann (now at ETH Zürich)

**M.Sc. Physics** 1999-2001
*Central University of Venezuela*
"Renormalization approach to solve two-phase flow in porous media"
Thesis adviser: Mariela (Freski) Araujo (now at Shell, Texas area)

**Bachelor Physics** 1992-1999
*Simón Bolivar University, Venezuela*
"Phase-space tomography of the truncated harmonic oscillator states"
Thesis adviser: Celso Luis Ladera

## PEER-REVIEWED JOURNAL PAPERS [scholar][researcherid][1]

| In Interdisciplinary Journals | # | Impact Factor |
|---|---|---|
| *Nature Energy* | 1 | 46.86 |
| *Nature* | 2 | 41.58 |
| *Science* | 1 | 41.06 |
| *Science Advances* | 1 | 11.51 |
| *Nature Communications* | 3 | 11.35 |
| *PNAS* | 4 | 9.50 |
| *Scientific Reports* | 3 | 4.12 |
| *PLoS Comp. Biol.* | 2 | 3.96 |
| *J. R. Soc. Interface* | 7 | 3.92 |
| *PLoS ONE* | 4 | 2.77 |
| *Data Min. & Know. Disc.* | 1 | 2.48 |
| *EPJ Data Science* | 3 | 2.98 |
| *Int. J. Inf. Sec.* | 1 | 0.96 |
| *IEEE Trans. in Big Data* | 1 | TBD |
| TOTAL | 34 | — |

| Statistical Physics Journals | # | Impact Factor |
|---|---|---|
| *Nature Physics* | 1 | 20.15 |
| *Phys. Rev. Letters* | 1 | 7.51 |
| *New J. of Physics* | 2 | 3.56 |
| *Physical Review E* | 2 | 2.29 |
| *J. Stat. Mech.* | 2 | 2.40 |
| *E. Physical J. B* | 2 | 1.35 |
| *J. of Physics A* | 1 | 1.58 |
| *Phil. Trans. A* | 1 | 2.15 |
| *Physica A* | 4 | 1.73 |
| *Physica D* | 1 | 1.64 |
| *Int. J. Mod. Phys. C* | 1 | 1.26 |
| *J. of Stat. Phys.* | 1 | 1.2 |
| *Rev. Mex. de Fis.* | 1 | 0.34 |
| TOTAL | 20 | — |

| Urban, Environment and Energy Journals | # | Impact Factor |
|---|---|---|
| *Applied Energy* | 2 | 7.18 |
| *Transp. Res. C* | 3 | 2.82 |
| *IEEE Trans. on ITS* | 1 | 2.38 |
| *Transportation* | 1 | 2.36 |
| *Transp. Res. Recs.* | 3 | 0.44 |
| TOTAL | 10 | — |

64. Olmos L.E.$^{+}$, Çolak S.*, and Gonzalez, M.C., "Non-equilibrium dynamics in urban traffic networks", *PNAS* **(to appear)**, (2018).**

63. Di Clemente, R.$^{+}$, Luengo-Oroz, M., Vaitla, B., and Gonzalez, M.C., "Revealing life styles in human spending habits", *Nature Communications* **9**, 3330 (2018).**

62. Alhasoun F.*, Alhazzani, M, Moyano L.G, Pinhanez, C., and Gonzalez, M.C., "A Computational Framework to Study Human Phenotypes by Age", *PLoS Comp. Biology* **14(6)**, e1006115 (2018).**

61. Xu Y.$^{+}$, Çolak S.*, Cara, E.C., Moura, S.J., and Gonzalez, M.C., "Planning for electric vehicle needs by coupling charging profiles with urban mobility", *Nature Energy* , 2058-7546 (2018).**

60. Barbour, E.$^{+}$ and Gonzalez, M.C., "Projecting battery adoption in the prosumer era", *Applied Energy* **215**, 356-370 (2018).**

59. Cuttone, A.*, Lehmann S.Gonzalez, M.C., "Understanding predictability and exploration in human mobility", *EPJ Data Science* **7(1)**, 2 (2018).**

[1]text in blue links to on-line information
[2]**denotes updates since appointment case 06/2017

58. Barbour, E.[+], Parra D., Awwad, Z.,Gonzalez, M.C., "Community energy storage: A smart choice for the smart grid", *Applied Energy* **7(1)**, 2 (2018).**

57. Kalila A.*, Awwad Z.*, Di Clemente R.[+] and Gonzalez M.C., "Big Data Fusion to Estimate Fuel Consumption: A Case Study of Riyadh", *Transportation Research Records, presented in the annual TRB meeting* **(to appear)**, (2018).**

56. Xu., Y.[+] and Gonzalez, M.C., "Collective benefits in traffic during mega events via the use of information technologies ", *J. R. Soc. Interface* **14(129)**, 20161041 (2017).

55. Jiang S.[+], Ferreira, Jr. J. and Gonzalez, M.C., "Activity-Based Human Mobility Patterns Inferred from Mobile Phone Data: A Case Study of Singapore", *paper presented at ACM KDD UrbComp'15, published in IEEE Trans. in Big Data* **Issue 9**, (2017).

54. Paldino, S.*, Bojic, I., Sobolevsky, S., Ratti, C. and Gonzalez M.C., "Uncovering Urban Temporal Patterns from Geo-tagged Photography", *PLoS ONE* **12(11)**, e0165753 (2016).

53. Chodrow, P*, Awwad, Z, Jiang, S.[+], and Gonzalez, M.C., "Demand and Congestion in Multiplex Transportation ", *PLoS ONE* **11(9)**, e0161738 (2016).

52. Jiang S.[+],Yang Y.*, Gupta S.*, Veneziano D., Athavale S., and Gonzalez, M.C., "TimeGeo: a spatiotemporal framework for modeling urban mobility without surveys", *PNAS* **113(37)**, E5370-E5378 (2016).

51. Qomi M.J.A.*, Noshadravan A., Sobstyl A., Toole J.*,Ferreira Jr. J., Pellenq R.J.M., Ulm F.J. and Gonzalez, M.C., "Data Analytics for Simplifying Thermal Efficiency Planning", *J. Roy. Soc. Interface* **13**, 20150971 (2016).

50. Lima, A.*, Stanojevic R., Papagiannaki D., Rodriguez P. and Gonzalez, M.C., "Understanding individual routing behaviour", *JRS Interface* **13**, 20160021 (2016).

49. Çolak, S.*, Lima, A.*, and Gonzalez, M.C., "Understanding congested travel in urban areas", *Nature Comms.* **Vol. 2**, 10793 (2016).

48. Halu A.[+], Scala A., Khiyami A., and Gonzalez, M.C., "Data-driven modeling of solar-powered urban microgrids", *Science Advances* **2(1)**, (2016).

47. Fast, S.M.*, Gonzalez, M.C. and Markuzon N., "Cost-Effective Control of Infectious Disease Outbreaks Accounting for Societal Reaction", *PLoS ONE* **10(8)**, e0136059 (2015).

46. Paldino, S.*, Bojic, I., Sobolevsky, S., Ratti, C. and Gonzalez M.C., "Urban Magnetism Through The Lens of Geo-tagged Photography", *EPJ Data Science* **4(1)**, 1-17 (2015).

45. Toole J.L.*, Lin Y., Muehlegger E., Shoag D.,Gonzalez M.C. and Lazer D., "Tracking Employment Shocks using Mobile Phone Data", *J. R. Soc. Interface* **12**, 20150185 (2015).

44. Toole J.L.*, Colak S.*, Sturt B.*, Alexandre L.*, Evsukoff A. and Gonzalez M.C., "The Path Most Travelled : Travel Demand Estimation Using Big Data", *Transportation Research Part C: Emerging Technologies* **58**, 162-177 (2015).

[3]** denotes updates since appointment case 06/2017
[4]Student * or Postdoc [+] directly supervised by Gonzalez

43. Çolak S.*, Alexander L.P*., Guatimosim Alvim B., Mehndiretta S.R. and Gonzalez M.C., "Analyzing Cell Phone Location Data for Urban Travel: Current Methods, Limitations and Opportunities", *Transportation Research Records, presented in the annual TRB meeting as "Practice Ready"* , (2015).

42. Fast S.M.*,Gonzalez M.C., Wilson J.M., and Markuzon N., "Modeling the Propagation of Social Response during a Disease Outbreak", *J. R. Soc. Interface* **12**, 20141105 (2015).

41. Widhalm P., Yang Y.*, Ulm M., Athavale S. and Gonzalez M.C., "Discovering urban activity patterns in cell phone data", *Transportation* **42**, 597-623 (2015).

40. Alexander L.*, Jiang S.*, Murga M., and Gonzalez M.C., "Validation of origin-destination trips by purpose and time of day inferred from mobile phone data", *Transportation Research Part C: Emerging Technologies* **48**, 240-250 (2015).

39. Toole J.L.*, Herrera-Yagüe C.*, Schneider C.M.$^{+}$, and Gonzalez M.C., "Coupling Human Mobility and Social Ties Social Ties", *Journal of The Royal Society Interface* **12(105)**, 20141128 (2015).

38. Herrera-Yagüe C.*, Schneider C.M.$^{+}$, Couronne T., Smoreda Z., Benito R.M., Zufiria P.J., and Gonzalez M.C., "The Anatomy of Urban Social Networks and its Implications in the Searchability Problem", *Scientific Reports* **5**, 10265 (2015).

37. De Domenico M., Lima A., Gonzalez M.C. and Arenas A., "Personalized Routing for Multitudes in Smart Cities", *EPJ Data Science* **4**, 1 (2015).

36. Iqbal Md.S., Choudhury C.F., Wang P.$^{+}$ and Gonzalez M.C., "Development of Origin-destination Matrices Using Phone Call Data", *Transportation Research Part C: Emerging Technologies* **40**, 63-74 (2014).

35. Yang Y.*, Herrera-Yagüe C.*, Eagle N., and Gonzalez M.C., "Limits of Predictability in Commuting Flows in the Absence of Data for Calibration", *Scientific Reports* **4**, 5662 (2014).

34. Wang P.$^{+}$, Liu L., Li X., Li G. and Gonzalez M.C., "Empirical Study of Long-range Connections in a Road Network Offers New Ingredient for Navigation Optimization Models", *New Journal of Physics* **16**, 013012 (2014).

33. Yang Y.*, Gerstle D.*, Widhalm P., Bauer D. and Gonzalez M.C., "Potential of Low-Frequency Automated Vehicle Location Data for Monitoring and Control of Bus Performance", *Transportation Research Record: Journal of the Transportation Research Board* **2351(1)**, 54-64 (2014).

32. Ren Y., Ercsey-Ravasz M., Wang P.$^{+}$, Gonzalez M.C. and Toroczkai Z., "Predicting commuter flows in spatial networks using a radiation model based on temporal ranges", *Nature Communications* **5**, 5347 (2014).

31. Herrera-Yagüe, C.*, Schneider, C.$^{+}$, Smoreda, Z., Couronne and Gonzalez, M.C., "The elliptic model for communication fluxes", *Journal of Statistical Mechanics: Theory and Experiment* **2014(4)**, P04022 (2014).

[5] Student * or Postdoc $^{+}$ directly supervised by Gonzalez

30. Tizzoni M., Bajardi P., Decuyper A., Kon Kam King G., Schneider C.M.$^{+}$, Blondel V., Smoreda Z., Gonzalez M.C. and Colizza V., "On the Use of Human Mobility Proxy for the Modeling of Epidemics", *PLoS Comput Biol* **10(7)**, e1003716 (2014).

29. Colak S.*, Schneider C.M.$^{+}$, Wang P.$^{+}$, and Gonzalez M.C., "On the Role of Spatial Dynamics and Topology on Networks Flows", *New Journal of Physics* **15**, 113037 (2013).

28. Schneider C.M.$^{+}$, Belik V.$^{+}$, Couronné T., Smoreda Z., and Gonzalez M.C., "Unravelling Daily Mobility Motifs", *Journal of The Royal Society Interface* **10(84)**, 20130246 (2013).

27. Wang P., Gonzalez M.C., Menezes R., Barabási A.-L., "Understanding the Spread of Malicious Mobile-phone Programs and their Damage Potential", *Int. J. of Inf. Security* **12(5)**, 383-392 (2013).

26. Hasan S., Schneider C.M.$^{+}$, Ukkusuri S.V. and Gonzalez M.C., "Spatiotemporal Patterns of Human Mobility", *Journal of Statistical Physics* **151**, 304-318 (2013).

25. Jiang S.*, Ferreira Jr J. and Gonzalez M.C., "Clustering Daily Patterns of Human Activities in the City", *Data Mining and Knowledge Discovery* **25**, 478-510 (2012).

24. Simini F., Gonzalez M.C., Maritan A., Barabasi A.-L., "A Universal Model for Mobility and Migration Patterns", *Nature* **484 (7392)**, 96-100 (2012).

23. Toole J.L.*, Cha M. and Gonzalez M.C., "Modeling the Adoption of Innovations in the Presence of Geographic and Media Influences", *PLoS ONE* **7(1)**, e29528 (2012).

22. Fazeen M., Gozick B., Dantu R., Bhukhiya M. and Gonzalez M.C., "Safe Driving Using Mobile Phones", *Intelligent Transportation Systems, IEEE Transactions on* **13(3)**, 1462-1468 (2012).

21. Wang P.$^{+}$, Hunter T., Bayen A.M., Schechtner K., and Gonzalez M.C., "Understanding Road Usage Patterns in Urban Areas", *Scientific Reports* **2**, 1001 (2012).

20. Nicolaides C., Cueto-Felgueroso L., Gonzalez M.C., and Juanes R., "A Metric of Influential Spreading during Contagion Dynamics through the Air Transportation Network", *PLoS ONE* **7(7)**, e40961 (2012).

19. Onnela J.-P., Arbesman S., Gonzalez M.C., Barabasi A.-L., and Christakis N.A., "Geographic Constraints on Social Network Groups", *PLoS ONE* **6(4)**, e16939 (2011).

18. Park J., Lee D.-S., and Gonzalez M.C, "The Eigenmode Analysis of Human Motion", *Journal of Statistical Mechanics: Theory and Experiment* **2010.11**, P11021 (2010).

17. Wang P. and Gonzalez M.C., "Understanding Spatial Connectivity of Individuals with Non-uniform Population Density", *Philosophical Transactions A* **367**, 3321-3329 (2009).

16. Wang P. and Gonzalez M.C., Hidalgo C.A and Barabási A.-L., "Understanding the Spreading Patterns of Mobile Phone Viruses", *Science* **324**, 1071-1076 (2009).

15. Gonzalez M.C., Hidalgo C.A and Barabási A.-L., "Understanding Individual Human Mobility Patterns", *Nature* **453**, 479-482 (2008).

[6] Student * or Postdoc $^{+}$ directly supervised by Gonzalez

14. Candia J., Gonzalez M.C., Wang P., Schoenharl T. , Madey G.,and Barabási A.-L., "Uncovering Individual and Collective Human Dynamics From Mobile Phone Records", *Journal of Physics A: Mathematical and Theoretical* **41**, 224015 (2008).

13. Gonzalez M.C. and Barabási A.-L., "Complex Networks: From Data to Models", *Nature Physics* **3**, 24-25 (2007).

12. Gonzalez M.C., Herrmann H.J., Kertesz J., and Vicsek T., "Community Structure and Ethnic Preferences in School Friendship Networks", *Physica A* **379**, 307-316. (2007).

11. Schwaemmle V., Gonzalez M.C., Moreira A.A., Andrade J.S. Jr., and Herrmann H.J., "Different Topologies for a Herding Model of Opinion", *Physical Review E* **75**, 066108 (2007).

10. Gonzalez M.C., Lind P.G. and Herrmann H.J., "Networks based on Collisions among Mobile Agents", *Physica D* **224**, 137-148 (2007).

9. Gonzalez M.C., Lind P.G. and Herrmann H.J., "System of Mobile Agents to Model Social Networks", *Physical Review Letters* **96**, 088702 (2006).

8. Gonzalez M.C., Lind P.G. and Herrmann H.J., "Model of Mobile Agents for Sexual Interactions Networks", *European Physical Journal B* **49**, 371-376 (2006).

7. Gonzalez M.C., Sousa A.O., and Herrmann H.J., "Renormalizing Sznajd Model on Complex Networks Taking into Account the Effects of Growth", *European Physical Journal B* **49**, 253-257 (2006).

6. Lind P.G., Gonzalez M.C. and Herrmann H.J., "Cycles and Clustering in Bipartite Networks", *Physical Review E* **72**, 056127 (2005).

5. Gonzalez M.C., Araujo A.D. and Herrmann H.J., "Cluster Size Distribution of Infection in a System of Mobile Agents", *Physica A* **356**, 100-106 (2005).

4. Gonzalez M.C., Sousa A.O., and Herrmann H.J., "Opinion Formation on a Deterministic Pseudo-fractal Network", *International Journal of Modern Physics C* **15**, 45-57 (2004).

3. Gonzalez M.C. and Herrmann H.J., "Scaling of the Propagation of Epidemics in a System of Mobile Agents", *Physica A* **340**, 741-648 (2004).

2. Gonzalez M.C. and Araujo M., "The Effect of the Fractal Dimension on Saturation Trajectories on Multi-phase Flow", *Revista Mexicana de Fisica* **49**, 14-16 (2003).

1. Gonzalez M.C., Rodriguez A., and Araujo M., "Flow Equations on a Fractal Structure", *Physica A* **298**, 297-314 (2001).

## PROCEEDINGS OF REFEREED CONFERENCES

1. Albert, A.$^{+}$, Strano, E.$^{+}$, Kaur, J. and Gonzalez, M.C. The dark side of the Earth: benchmarking lighting access for all cities on Earth and the *CityNet* dataset, UrbComp'18: Proceedings of the ACM SIGKDD International Workshop on Urban Computing,(2018)**.

[7]** denotes updates since appointment case 06/2017

2. Albert, A$^{+}$, Strano, E$^{+}$, Kaur, J. and Gonzalez, M.C., Modeling urbanization patterns with generative adversarial networks, IEEE International Geosciences and Remote Sensing Symposium(IGARSS),(2018)**.

3. Alhasoun, F.*, Alhazzani, M., Aleissa, F., Alnasser, R., and Gonzalez, M.City Scale Next Place Prediction from Sparse Data through Similar Strangers, UrbComp'17: Proceedings of the ACM SIGKDD International Workshop on Urban Computing,(2017)**

4. Xu S.*, Barbour, E$^{+}$, and Gonzalez, M.C.Household Segmentation by Load Shape and Daily Energy Consumption, UrbComp'17: Proceedings of the ACM SIGKDD International Workshop on Urban Computing,(2017)**

5. Albert, A$^{+}$, Kaur, J. and Gonzalez, M.C.Using convolutional networks and satellite imagery to identify patterns in urban environments at a large scaleProceedings of the 23rd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining(2017)

6. Florez, M.A.*, Jiang, S.$^{+}$, Li, R., Mojica, C., Rios, R. and Gonzalez, M.C., Measuring the impacts of economic well being in commuting networks—A case study of Bogota, Colombia, Proceedings of the TRB Meeting, (2017).

7. Xu, Y.$^{+}$, Li, R.*, Jiang, S.$^{+}$, and Gonzalez, M.C., Clearer Skies in Beijing: Revealing Impacts of Traffic on the modeling of Air Quality, Proceedings of the TRB Meeting,(2017).

8. Morse S.*, Gonzalez, M.C. and Markuzon, N.,Persistent Cascades: Measuring Fundamental Communication Structure in Social Networks, Proceedings of IEEE Big Data 2016, (2016).

9. Yang Y.*, Widhalm P.*, Athavale S. and Gonzalez, M.C."Mobility Sequence Extraction and Labeling Using Sparse Cell Phone Data", In Proceedings of the Conference on Artificial Intelligence (AAAI'16), **Finalist Student Abstract**, (2016).

10. Çolak S.*, Alexander L.P.*, Guatimosim Alvim B., Mehndiretta S.R. and Gonzalez M.C., Analyzing Cell Phone Location Data for Urban Travel: Current Methods, Limitations and Opportunities, Proceedings of the TRB Meeting, **"Practice Ready"**, (2015).

11. Yang Y.*, Gerstle D., Bauer D., Widhalm P.*, and Gonzalez M.C., "Potential of Low-Frequency Automated Vehicle Location Data for Monitoring and Control of Bus Performance", Proceedings of the TRB Meeting, **"Practice Ready"**, (2013).

12. Jiang S.*, Yang Y.*, Fiore G., Ferreira Jr. J., Frazzoli E. and Gonzalez M.C., "A Review of Urban Computing for Mobile Phone Traces: Current Methods, Challenges and Opportunities" UrbComp'13: Proceedings of the ACM SIGKDD International Workshop on Urban Computing, doi:10.1145/2505821.2505828, **"Best Paper Award"**, (2013).

13. Colak S.*, Schneider C. M.$^{+}$, Wang P.$^{+}$ and Gonzalez M. C.,"Emergence of Congestion in Road Networks" NECTAR 2013 International Conference, Dynamics of Global And Local Networks, University of Azores, São Miguel Island, Portugal (2013).

14. Schneider C. M.$^{+}$, Rudloff C., Bauer D., Gonzalez M. C.,"Daily Travel Behavior: Lessons from a Week-long Survey for the Extraction of Human Mobility Motifs Related Information", UrbComp'13: Proceedings of the ACM SIGKDD International Workshop on Urban Computing, doi:10.1145/2505821.2505829, (2013).

[8]Student * or Postdoc $^{+}$ directly supervised by Gonzalez
[9]** denotes updates since appointment case 06/2017

15. Toole J.L.*, Ulm M., Gonzalez M.C., and Bauer D., "Inferring Land Use from Mobile Phone Activity", UrbComp'12: Proceedings of the ACM SIGKDD International Workshop on Urban Computing, doi:10.1145/2346496.2346498, **"Best Paper Award"** (2012).

16. Jiang S.*, Ferreira Jr J., and Gonzalez M.C., "Discovering Urban Spatial Temporal Structure From Human Activity Patterns" UrbComp'12: Proceedings of the ACM SIGKDD International Workshop on Urban Computing, doi:10.1145/2346496.2346512, (2012).

17. Madey G.R., Barabasi A.-L., Chawla N.V., Gonzalez M.C., Hachen D., Lantz B., Pawling A., Schoenharl T., Szabo G., Wang P. and Yan P., "Enhanced Situational Awareness: Application of DDDAS Concepts to Emergency and Disaster Management", International Conference on Computational Science, serial Lecture Notes in Computer Science, Lecture Notes in Computer Science, **4487**, 1090-1097, (2007).

18. Gonzalez M.C. and Araujo M,"Alteracion de la Mojabilidad por Reacciones Quimicas" (in Spanish), Revista Venezolana de Qumica, **4**, (2001).

19. Gonzalez M.C. and Araujo M, "Reaction Kinetics Effects on Reactive Wetting", MRS Proceedings,**651**, T3.8.1, (2000).

## OTHER PUBLICATIONS

- Morik, K., Giannotti, F., Gonzalez, M., and Katakis, I., Editor's Note: Special Section on Data Mining for Smart Cities. in *Data Mining and Knowledge Discovery*, Vol. 32, Issue 3, p. 736, (2018)**.

- Kimon Proussaloglou, Shan Jiang, and Marta C. Gonzalez Cell Phone Location Data for Travel Behavior Analysis for *NCHRP, National Academy of Science, Transportation Research Board* (2018).

- Vaitla, Bapu and Bosco, Claudio and Alegana, Victor and Bird, Tom and Pezzulo, Carla and Hornby, Graeme and Sorichetta, Alessandro and Steele, Jessica and Ruktanonchai, Cori and Ruktanonchai, Nick and others, Funded Report: "Big Data and the Well-Being of Women and Girls" for *Data2X and the UN Foundation* (2017).

- Toole J.L.*, de Montjoye Y.A., Gonzalez M.C. and Pentland A., Book Chapter: "Modeling and Understanding Intrinsic Characteristics of Human Mobility" in *Social Phenomena: From Data To Models*, B. Gonçalves, N. Perra (Editors), Springer, (2015).

- Menezes R., Evsukoff A. and Gonzalez M.C., (Eds.) "Complex Networks", *Studies in Computational Intelligence*, Springer, Vol. 4242013, X, 266 p. 85 illus, (2013).

- Gonzalez M.C.,"Contact Networks of Mobile Agents and Spreading Dynamics", Ed. Logos-Verlag, ISBN 978-3-8325-1318-4. 168 pp. PhD Thesis in Physics (Dr. rer. nat), Faculty of Mathematics and Physics: Department of Physics, Stuttgart Univarsitaet.

[10]** denotes updates since appointment case 06/2017

## PEER-REVIEWED JOURNAL PAPERS (UNDER REVIEW)

4. Steven Morse*, Marta Gonzalez, and Natasha Markuzon, "Role of persistent cascades in diffusion", *Physical Review E* **(submitted)**, (2018).**

3. Edward Barbour$^{+}$, Samar Alqatari and Marta Gonzalez, "Predictability of electricity consumption in residential households: A comparative study", *EPJ Data Science* **(submitted)**, (2018.).**

2. Xu, Y.$^{+}$, Li, R.*, Jiang, S.$^{+}$, Sofiane Abbar, and Gonzalez, M.C., "Unraveling Environmental Justice in Ambient PM2.5 Exposure in Beijing: A Big Data Approach", *Environmental Science & Technology* **(reviewed and resubmitted)**, (2018.).**

1. Alexander L.P.* and Gonzalez, M.C., "Assessing the Impact of Real-time Ridesharing on Urban Traffic using Mobile Phone Data", *paper presented at ACM KDD UrbComp'15, Submitted to Transportation Research A: Policy and Practice* **(submitted)**, (2016).**

## RESEARCH GRANTS [≈$4.52M/8yrs]

- World Bank Group, "Non-Motorized Transport Data Science & Analytics", $50,000 (PI, 10/18 - 09/19).**
- World Bank Group, "Climate Resilience Urban Transport Network and Accessibility", $50,000 (PI, 10/18 - 09/19).**
- Millenium Challenge Corporation and USAID/LAB/CDR, "Development Impact Lab (DIL) Measuring the Economic Costs of Traffic Congestion in Colombo, Sri Lanka", $80,000 (PI, 10/18 - 09/19).**
- DiDi, Smart Transportation IFP program, "Data fusion to improve urban traffic and reduce environmental impact", $100,000 (PI, 10/18 - 08/19).**
- Berkeley Big Drive, "Impacts on Energy Consumption of Autonomous Vehicles in the Bay Area", $25,000 (PI, 09/18 - 08/19).**
- ITS Berkeley, "Planning the Adoption of Electric Vehicles in the Bay Area: Environmental Benefits vs. Costs to the Powergrid", $62,500 (PI, 09/17 - 08/19).**
- Cintra-Ferrovial, "Uncovering route choice preferences for marketing segmentation", $150,000 (PI, 4/17 - 12/17).
- Philips Co, "Classifying Typologies of Urbanization with Satellite Imagery", $150,000 (PI, 09/16 - 09/17).
- Qatar Computing Research Institute, "Urban Data Analytics to Improve Mobility for Growing Cities in the Context of Mega Events ", $250,000 (PI, 4/16 - 6/17).
- Bill and Melinda Gates Foundation, "Fueling the adoption of digital financial services through the combination of ubiquitous mobile computing and analysis of financial data", $42,014 (PI, 9/16 - 05/17).

[11]** denotes updates since appointment case 06/2017

- UN Foundation, "A gender study on employment with mobile phone data", $60,069 (PI, 9/16 - 12/17).
- Philips Co., "Uncovering the relation of streets and buildings occupancy with luminosity levels", $150,000 (PI, 9/16 - 10/17).
- MIT-Energy Inititive, "Understanding the Impact of Electric Vehicle Charging on the Power Grid: An Urban Mobility Perspective", $112,201 (PI, 4/16 - 6/17).
- Siebel Energy Institute, "Understanding the Impact of Electric Vehicle Charging on the Power Grid: An Urban Mobility Perspective", $21,500 (PI, 1/16 - 5/16).
- Phillips Co., "Smarter lighting for urban environments informed by mobile phone activity", $100,000 (PI, 2/16 - 6/16).
- UN Foundation, "A gender study on employment with mobile phone data", $60,069 (PI, 1/16 - 8/16).
- Bill & Melinda Gates Foundation, "Interest-bearing parent - Fueling the adoption of digital financial services through the combination of ubiquitous mobile computing and analysis of financial data", $86,401 (PI, 11/15 - 10/16).
- King Abdulaziz City for Science & Technology (KACST), "Modeling Energy Efficiency and Electricity Demand at the Urban Scale", $300,000 (PI, 7/17 - 6/17).
- King Abdulaziz City for Science & Technology (KACST), "Planning Riyadh Metro", $300,000 (PI, 7/17 - 6/17).
- MIT Environmental Solutions Initiative, "Clearer Skies in Beijing, Collecting and Interpreting Relevant Spatio- temporal Data for Air Quality Assessment", $100,000 (PI, 4/15 - 6/16).
- Cambridge Systematics, "Cell Phone Location Data for Travel Behavior Analysis", $108,895 (PI, 6/14 - 3/16).
- MIT-Brazil Seed Grant, "Enabling Efficient Energy Usage with Data Mining and Integrated Demand", $45,000 (PI, 1/15 - 1/16).
- Singapore-MIT Alliance for Research and Technology Centre, "Future Mobility Research", $75,000 (PI, 6/14 - 4/16).
- U.S. Department.of Transportation, "Coupled Mobility Networks: A Data Driven Approach", $75,000 (PI, 9/13 - 5/16).
- Ford Motor Company, "Transportation Mobility Inference Model Based on Mobile Device Usage and Data", $300,000 (PI, 7/13 - 6/16).
- Portuguese Science and Technology Foundation, "Data Driven Urban Sciences: Models and Methods", $70,000 (PI, 7/14 - 12/15).
- The World Bank, "Urban Mobility Research Project for World Bank", $108,875 (PI, 6/14 - 5/15).
- Interamerican Development Bank, "Mobile Data Mining for Urban Transport", $85,714 (PI, 6/14 - 8/14).

- Austrian Institute of Technology, "Cooperation AIT/MOB/DTS - MIT/CEE/HUMNET for 2013", $95,634 (PI, 5/13 - 3/15).
- Accenture, LLP, "Behavior Data Integration and Offers Platform", $100,729 (PI, 4/13 - 1/15).
- BMW, AG, "Urban Mobility Research Project for BMW i Mobility Services", $102,628 (PI, 11/12 - 10/14).
- Austrian Institute of Technology, "Joint Research in Understanding Urban Mobility HumNet - MIT", $86,665 (PI, 1/12 - 7/13).
- U.S. Department.of Transportation, "Transportation Model in the Boston Metropolitan Area from Origin Destination Matrices Generated with Big Data", $150,000 (PI, 1/12 - 8/15).
- NEC and Bushbaum Foundations, "Human Mobility and Networks", $200,000 (PI, 6/11).
- ILAB, Orange Labs Internationaux, "Interpolating Human Trajectories and Behavior Study on Human Mobility", $96,588 (PI, 1/11 - 8/13).
- U.S. Department.of Transportation, "Interpolating Human Trajectories and Behavior Study on Human Mobility", $150,000 (PI, 9/10 - 8/13).
- U.S. Department.of Transportation, "Disruptive Technologies, Strategy and MBTA", $57,748 (PI, 9/10 - 12/11).
- Portuguese Science and Technology Foundation, "MPP-Y5-Trans-Res-Gonzalez", $90,901 (PI, 9/10 - 9/12).
- National Academy of Sciences, "The Search for Universal Laws of Human Movement: A Cross-Cultural Study", $62,500 (co-PI, 8/09 - 12/10).

## PENDING RESEARCH GRANTS

- DoE, "M-POWER (Modern Power Systems Online Workforce Educational Resource) Center", $250,000 (PI, submitted 07/01/2018).**
- State of California Air Resources Board Research Division, "Evaluating Congestion Mitigation in Los Angeles: Environmental and Local Benefits", $128,147 (PI, submitted 06/15/2018).**
- LBNL-Lab Directed Research, "Big Data Fusion for Smart and Sustainable Mobility ", $437,660 (PI, submitted 03/23/2018).**
- NSF, "SCC: Climate Adaptation & Resilient Engineering for Urban micro-communities & Megalopolises", $3,000,000 (co-PI, submitted 02/28/2018).**
- NSF, "SCC-IRG: Building capacity in low income schools and communities with mobile apps and data science to support engagement and planning", $3,000,000 (co-PI, submitted 02/28/2018).**

## INVITED TALKS AT INTERNATIONAL CONFERENCES

71. Keynote Speaker: "Computational Urban Science", Annual International Conference on Computational Social Science ($IC^2S^2$), Northwestern University, Chicago, 07/2018 **

70. Pleanary Speaker:"Computational Urban Science", International Conference on Complex Systems (ICCS 2018), Boston, 07/2018 **

69. "Computational Urban Science", Workshop in Multimodal Data Fusion, Northeastern University, Boston, 03/2018 **

68. "Computational Urban Science", Workshop in Multimodal Data Fusion, Northeastern University, Boston, 03/2018 **

67. "Mobility Models from Novel Data Sources", TRB, Emerging Methods Subcommittee, Washington, DC, 01/2018 **

66. "Modelling and Visualizing Science and Technology", Sackler Colloquium sponsored by the U.S. National Academy of Sciences, Irvine, CA, 12/2017

65. Keynote Speaker at CCHIT Congreso Chileno de Ingeniería de Transporte, La Serena, Chile, 10/2017

64. "The TimeGeo Modeling Framework for Urban Motility Without Travel Surveys", JSM: Joint Statistical Meeting, Baltimore, DC, 08/2017

63. Keynote "Information and Communication Technologies to Tackle Urban Challenges", Conference on Complex Systems, Cancun, Mexico, 9/2017

62. "Data Science to tackle Urban Challenges", LANET: Latin American Conference in Complex Networks, Puebla, Mexico, 9/2017

61. "Data Science for Energy Efficiency in Cities", Complex Systems Cross Roads, Mallorca, Spain, 6/2017

60. "Urban Data Analytics to Improve Mobility for Growing Cities in the Context of Mega Events", QCRI-MIT CSAIL Annual Research Project Review 2017 , Doha, Qatar, 03/2017

59. "Big Data to Tackle Urban Challenges",SoFiA, Latin American School and Workshop on Data Analysis and Mathematical Modeling of Social Sciences, Buenos Aires, Argentina, 11/2016

58. "Demand Management of Big Events: A Multiplex story", CCS16's Workshop: Multilayer and Interconnected Networks: Applications, Amsterdam, The Netherlands, 9/2016

57. "From individual mobility to transportation networks", Summer school tutor in the annual meeting of the European Association for Researh in Transportation (hEART)., Delft, The Netherlands, 9/2016

56. "The TimeGeo modeling framework for urban mobility without travel surveys",The Netherlands Mobility Panel (MPN) Symposium, Amsterdam, The Netherlands, 09/2016

55. "Patterns of Crimes and Commuting in Urban Networks", Workshop on Predicting Policing, Brown University, RI, 8/2016

54. "Big Data to tackle Urban Mobility Challenges", MIT Sloan conference in Bogota on Big Data: Shaping the future of Latin America, Bogota, Colombia, 5/2016

53. "Modeling Adoption of Innovations", Department of Energy, Decision Science Workshop at the Building Technology Office Peer Review, Maryland, DC, 4/2016

52. "Big Data to Tackle Urban Challenges", Workshop in Urban Physics, MIT, Cambridge, 3/2016

51. "TimeGeo: modeling urban mobility without travel surveys", Workshop Urban on Data Science, University of Cambridge, UK, 12/15

50. "Surveyless models of trip diaries", IPAM workshop "TRAWS2: Traffic Estimation", UCLA, Los Angeles, 11/15 (video)

49. "Big data to tackle urban traffic", IPAM workshop "TRAWS4: Decision Support for Traffic", UCLA, Los Angeles, 10/15 (video)

48. "A review of human mobility: basic mechanisms and urban effects", Mediterranean School of Complex Networks, Salina, Sicily, Italy, 9/15

47. Keynote "Information and Communication Technologies to Tackle Urban Challenges", Conferencia:Tecnologia, Automação e o Futuro da Mobilidade, FGV, Rio de Janeiro, Brazil, CA 8/15

46. "Data-driven modeling of urban solar microgrids", EMI 2015 Minisymposium: Advances in Quantitative Engineering Sustainability, University of Standford, CA, 6/15

45. "Feasibility of Micro-Grid Adoptions in Spatially-Embedded Urban Networks", SIAM Snowbird Conference Mini-symposium: Data-Driven Modeling of Dynamical Processes in Spatially-Embedded Random Networks, Utah, 5/15

44. "Big Data Insights into Complex Socio-Technical Systems", 2015 National Academy of Engineering-AAES Convocation of the Professional Engineering Societies AAES Awards Dinner Annual Engineering Public Policy Symposium, Washington D.C., 4/15

43. "General Principles of Human Mobility", Janeiro, Brazil, 1/2015

42. "Big Data Analytics for Energy Efficiency of Cities at the Workshop "Bringing Social Science to Big Data", Harvard University, Cambridge, 12/14

41. "Urban Social Networks: the Interplay of Social Distance and Geographic Proximity" CitiNet Workshop of the ECCS '14, European Conference on Complex Systems, Lucca, Italy, 9/2014

40. "ICT for better Cities" invited to the "INE Knowledge Week" if the Inter-American Development Bank in the panel "Women Innovators in the Urban Space", Washington DC, 9/14

39. Keynote:"Big Data Analytics for Energy Efficiency of Cities", Keynote Speaker at the Engineering Mechanics Institute (EMI) Conference of the American Society of Civil Engineers (ASCE), Hamilton, Ontario, Canada, 8/2014

38. "ICT for better Cities" invited to the "INE Knowledge Week" of the Inter-American Development Bank in the panel "Women Innovators in the Urban Space", Washington DC, 9/14

37. "Statistical Physics Methods to Tackle Urban Challenges", Workshop Dynamic Systems: From Statistical Mechanics to Engineering Applications, ETH Zurich, Switzerland, 1/14

36. "ICT to tackle Urban Challenges",Network Frontier Workshop, Northwestern University, Chicago, IL., 12/13

35. "ICT to tackle Urban Challenges," Workshop on How Far Can "Big Data" Take Us Towards Understanding Cities?, Santa Fe Institute, New Mexico, 9/13

34. "From Individual Mobility to Transportation Networks", StatPhys 25: 25th IUPAP International Conference on Statistical Physics, Seoul, Korea, 7/13

33. "Unraveling Daily Human Mobility Patterns" NetSci'13 Workshop: A Conversation in Human Dynamics, Denmark, Copenhagen, 6/13

32. "Unraveling Daily Human Mobility Patterns," SIAM Snowbird Conference, Symposium Computational Social Science, Utah, 5/13

31. "A Review of Human Mobility Models based on Digital Traces of Human Activity", 1-Day Tutorial SPB13, International Conference on Social Computing, Behavioral-Cultural Modeling, & Prediction, Washington DC, 4/13

30. "Understanding Human Mobility applied to describe Road Usage Patterns in Urban Areas," The 2013 German-American Frontiers of Engineering Symposium, Session Transportation in Complex Systems, Irvine, California., 4/13

29. "A Multi-scale Mobility Model" AAA 2013 Annual Meeting, Symposium on Predictability: From Physical to Data Science, Boston, MA, 2/13

28. "A Comparative Study of Geographic Routing in Social Network Based on Mobile Phone Data," WIDS 2012: Interdisciplinary Workshop on Information and Decision in Social Networks, MIT-MediaLab, Cambridge, 11/12

27. "From Individual Mobility to Transportation Networks", Auto-ID Labs Big Data Conference, MIT, Cambridge, MA, 11/12

26. "Individual Mobility Patterns," NSF-Workshop: "Transportation and Complexity", Martha's Vineyard, MA, 5/12

25. "Individual Mobility Networks from Clusters of Human Activity NetMob," Second Conference on the Analysis of Mobile Phone Datasets and Networks MIT (Media Lab), Cambridge, 10/11

24. "Individual Mobility Networks from Clusters of Human Activity NetMob," Second Conference on the Analysis of Mobile Phone Datasets and Networks MIT (Media Lab), Cambridge, 10/11

23. "Mobile Data for Urban Transformation" TEDx Conference: 'Big Data, Big Stories', Vermont Complex Systems Conference, University of VermontVermont, 10/11,

22. "Analytical Model and Measurements of Aggregated Mobility Networks," 13th annual Greater Boston Area Statistical Mechanics Meeting at Brandeis University on Saturday, Boston, 10/11

21. "From Individual Mobility to Transportation Networks", Norwich, UK, 6/11

20. "Multiplicative Cascades: How to model trip within cities", German Physical Society Meeting (DPG) Dresden, Germany, 3/11

19. "Cell Phones, Human Movement and Disease Dynamics" Workshop Disease in Motion, Princeton University, USA, 11/10

18. "Human Mobility", 2010 MIT Research and Development Conference: Mobility and Transportation Track, MIT ILP, Cambridge, USA, 11/10

17. "From Individual Mobility to transportation Networks," Two-days Lecture: First Mobility Data Mining and Privacy (MODAP), Summer School Rhodes, Greece, 8/10

16. "From Individual Mobility to transportation Networks", ESOF2010 - EuroScience Open Forum, Turin, Italy, 8/10

15. "Modelling Human Mobility", 2nd Invitational Workshop on Opportunistic RF Localization for Next Generation Wireless Devices, Worcester Polytechnic Institute, Worcester, MA., 6/10

14. "Modeling Large Scale Human Activity", American Physical Society March Meeting Portland, Session: Human Mobility: The Statistical Physics of When, Where and How, Portland, Oregon, 3/10

13. "Modeling the Spreading of Mobile Phone Viruses", Exploring Interconnections Workshop, National Institute of Health, NIH, Bethesda, MD., 1/10

12. "Mobility Networks and Spreading Dynamics", Workshop Future Networks - Economy, Energy, Health, MIT ILP, Cambridge., 10/09

11. "Understanding individual human mobility patterns", CAIMS 2009, the annual meeting of the Canadian Applied and Industrial Mathematics Society, London, Ontario, Canada., 6/09

10. "Mobility Networks and Spreading Dynamics, Rapidd Workshop, Harvard Medical School, Boston., 6/09

9. "Understanding individual human mobility patterns" Medyfinol 04: Conference on Nonequilibrium Statistical Mechanics and Nonlinear Physics, Mar del Plata, Uruguay, 12/08

8. "Understanding individual human mobility patterns", NIPS Workshop: Stochastic Models of Behaviour, Whistler, Canada, 12/08

7. "Using individual behavior to inform models of aggregate spatial dynamics," PAESS'08:Physics Applied to Economics and Social Sciences, Porto Alegre, Brazil, 11/08

6. "Using individual behavior to inform models of aggregate spatial dynamics," Workshop: Epidemiological Dynamics Across Spatial Scales: from Contact to Continent, Center for Infectious Disease Dynamics, Penn State University, State College 11/08

5. "Perspectives on Pervasive Computing," Workshop on Network Science and Pervasive Computing, Norwich, UK, 6/08,

4. "Perspectives on Pervasive Computing," Workshop on Network Science and Pervasive Computing, Norwich, UK, 6/08,

3. "Understanding individual human mobility patterns", Workshop: Workshop: Environmental Information Dynamics, Canada, Halifax, 4/08

2. "The heterogeneity and anisotropy in human travels and its effects in spreading dynamics", Workshop: Evolution and Structure of Complex Systems and Networks: Basic Techniques and Applications, Zentrum fuer Interdisziplinare Forschung, Bielefeld, Germany, 2/08

1. "Scaling of the propagation of epidemics in a system of mobile agents", Workshop: From Many-Particle physics to Multi-Agent Systems, Max-Planck Institute fuer Komplexe Systeme, Dresden, Germany, 7/04

## SEMINARS AND WORKSHOPS [12]

52. "Cell Phone Location Data for Travel Behavior Analysis", PTV Scientific Advisory Board Meeting, Karlsruhe, Germany, 6/18 **

51. "Data Science to study Macroscopic Dynamics in Urban Traffic Networks and Planning Urban Systems" Network Theory Seminar, UC Davis University, USA, 03/18 **

50. "Modeling and Planning Urban Systems with Novel Data Sources" Notestein Colloquium Series, Office of Population Research, Princeton University, USA, 02/18 **

49. "Modeling and Planning Urban Systems with Novel Data Sources", Operations Research center IAP Seminar on Social Impact, MIT, Cambridge, 01/18 **

48. "Perspectives on Big Data and Black-box Activity Models for Transportation Policy", NSF Workshop on the future of Demand Modeling, Berkeley, CA, 4/17

47. "Household Segmentation of Energy Consumption", Urban Energy Workshop at the Center for Complex Engineering Systems, King Abdulaziz City for Science and Technology, Riyadh, Saudi Arabia, 3/17

46. "Fuel consumption and urban policy", Integrated Transportation Systems Workshop at the Center for Complex Engineering Systems, King Abdulaziz City for Science and Technology, Riyadh, Saudi Arabia, 3/17

45. "Urban Computing", Qatar Computational Research Institute Scientific Advisory Committee Meeting, Carnegie Mellon University, Pittsburgh, 10/2016

44. "Urban Computing to tackle Urban Mobility Challenges", Northwestern University Transportation Center Seminar Series, Evanston, 09/2016

43. "Planning Integrated Transportation Systems using Big Data resources", Transportation Systems Workshop, King Abdulaziz City for Science and Technology,, Saudi Arabia, 3/23/2016

42. "Big Data to Tackle Urban Challenges", New York University University, NYC, 3/16

41. "Big Data to Tackle Urban Challenges", Northeastern University, Boston, 3/16

40. "Big Data to Tackle Urban Challenges", Uinversidade de Fortaleza, Ceara Brazil, 7/15

[12] NOT INCLUDING INVITATIONS INSIDE HOME INSTITUTION

39. "Urban Planning and Mobility Solutions with Big Data", Meeting: Building More Resilient Cities through Big Engineering, CUNY, New York City, 5/15

38. "Big Data Analytics for Energy Efficiency of Cities", Seminar at the Universidad de Ceara, Fortaleza, Brazil, 1/15

37. "Urban Social Networks: the Interplay of Social Distance and Geographic Proximity" Invited Seminar at Telefonica R&D, Barcelona, Spain, 9/14

36. "Modelling Transportation using Data from Passive Tracking Devises," Panel discussion on Big Data at the World Bank, Washington D.C., 3/14

35. "The path most traveled: a portable platform to match passive trajectories in roads", City Dynamics Workshop at the Center for Complex Engineering Systems, King Abdulaziz City for Science and Technology, Riyadh, Saudi Arabia, 3/14

34. "Unraveling the Coupling of Social Networks and Mobility," Seminar to Consumer Good Forum IT Committee, MIT ILP, Cambridge, 1/14

33. "Unraveling the Coupling of Social Networks and Mobility," Seminar to Consumer Good Forum IT Committee, MIT ILP, Cambridge, 1/14

32. "ICT to tackle Urban Challenges", INFORMS Boston Chapter, Cambridge, 11/13

31. "A Multi-Scale Multi-City Study of Commuting Patterns from Digital Traces", TechTalk: Draper Laboratory, Cambridge, 5/13

30. "Methods for Detecting Human Mobility", Seminar at the World Bank, Urban Transportation Department, Washington, D.C., 1/13

29. "Individual Mobility and Road Usage", Seminar at Lincoln Laboratories, Lexington, MA., 9/12

28. "Road Usage and Individual Mobility", Seminar at the Austrian Institute of Technology, Vienna, Austria, 7/12

27. "Road Usage and Individual Mobility," Seminar at BMW Headquarters, Munich,Germany, 7/12

26. "Road Usage Patterns," Seminar at the Physics Department, Northeastern University, CCNR, Boston, 2/12

25. "Human Mobility Patterns and Smart e-Commerce", Seminar on Big Data, Universidad Politecnica Comillas, Madrid, Spain, 11/11

24. "Mobility Networks and Clusters of Human Activities," Distinguished Invited Speaker Seminar at the Institute of Transportation Studies Seminar, UC Berkeley, CA, 9/11

23. "Research Perspectives: Human Mobility and Networks," Seminar at the Austrian Institute of Technology, Vienna, 6/11

22. "Multiplicative Cascades: How to Model Trips within Cities," Seminar at the Department of Physics, Universida de Lisbon, Lisbon, Portugal, 3/11

21. “Modeling Transportation Networks,” Seminar at the ISI Foundation, Turin, Italy, 6/2010

20. ”Exploring Human Mobility,” Seminar at the Department of Civil and Environmental Engineering,ETH Zurich, Switzerland, 3/2010

19. ”Modelling Human Mobility”, Transportation@MIT Seminar, Cambridge, 3/2010

18. ”Understanding Human Mobility”, Seminar at the Northwestern Institute on Complex Systems (NICO) Northwestern University, Chicago, IL, 1/2010

17. ”Transportation Networks,” Seminar at Engineering Sciences and Applied Mathematics (ESAM) Northwestern University, Chicago, IL, 1/2010

16. ”Understanding individual human mobility patterns”, Seminar at Telefonica I+D, Madrid, Spain, 4/2009

15. ”Understanding individual human mobility patterns”, Seminar at the Physics Department, College of Staten Island, City University of New York, Staten Island, NY, 3/2009

14. ”Detection of Networks of Mobility at a country scale using mobile phone records”, Seminar at the Intelligent Transportation Systems Lab, MIT, Department of Civil and Environmental Engineering, Cambridge, MA, 2/2009

13. ”Understanding individual human mobility patterns,” Seminar at IBM, Cambridge, MA, 2/2009

12. ”Understanding individual human mobility patterns,” Seminar at Pennsylvania State University, Industrial Engineering Department, State College, PA, 2/2009

11. ”Understanding individual human mobility patterns,” Seminar at Indiana University, School of Informatics, Bloomington, IN, 1/2009

10. ”Understanding Individual Human Mobility Patterns”, Microsoft Research New England, Cambridge, MA, 10/2008

9. “Networks with Geographic Information Mobility Patterns a Comparative Study”, Center for Interdisciplinary research in Complex Systems, Northeastern University, 10/2008

8. “Understanding Individual Human Mobility a Comparative Study”, Seminar at Sprint Research Labs, Burlinagame, CA, 7/2008

7. “Understanding Individual Human Mobility Patterns”, Seminar at the Retreat of the Center for Cancer Systems Biology, Dana Farber Cancer Institute, Harvard University, Cambridge, 7/2008

6. “Understanding Individual Human Mobility Patterns and its Applications to Social Networks with Geographic Information”, Seminar at Google Inc, Pittsburgh, 7/2008

5. “Understanding Individual Human Mobility Patterns and its Applications in Social Networks with Geographic Information”, Seminar at Icosystem Inc, Boston, 6/2008

4. ”Scaling of the propagation of epidemics in a system of mobile agents”, Workshop: From Many-Particle physics to Multi-Agent Systems, Max-Planck Institute fuer Komplexe Systeme, Dresden, Germany, 7/14

3. "Ethnic Preferences in School Social Networks", Seminar at Eotvos Lorand University (ELTE), Department of Biological Physics, Budapest, Hungary, 1/2006

2. "Community detection in empirical social networks", Seminar at the Harvard Medical School, Boston, 1/2006

1. "Contact Networks of Mobile Agents and Spreading Dynamics", Seminar at School of Informatics, Indiana University, Bloomington, 1/2006

## POSTDOCS

1. (2017-now) Luis E. Olmos, PhD in Physics, National University of Colombia**

2. (2015-now) Yanyan Xu, PhD in Artificial Intelligence,Shandong University, China

3. (2015-now) Edward Barbour, PhD in Mechanical Engineering, University of Edinburgh, UK.

4. (2016-2017) Adrian Albert, PhD in Electrical Engineering,Stanford University,USANow: Research Scientist, Lawrence Berkeley National Laboratory.**

5. (2016-2017) Emanuele Strano, PhD in Civil and Environmental Engineering, EPFL, Switzerland. Now: Postdoc at German Aerospace Center (DLR).**

6. (2015-2017) Riccardo Di Clemente, Ph.D. in Economics and Physics Bachelor, Institute for Advanced Studies IMTLucca, Italy. Now: Newton International Fellow of Royal Society at University College London.**

7. (2016-2017) Balazs Lengyel, PhD in Business and Management, Budapest University of Technology and Economics, Hungary. Now: Lecturer at the Centre for Economic and Regional Studies at Hungarian Academy of Sciences.**

8. (2015-2016) Shan Jiang, PhD in Urban Planning, MIT, USA. Now: Assistant Professor in Urban and Environmental Policy and Planning, Tuft University.**

9. (2014-2015) Arda Halu, PhD in Physics, Northeastern University, USA. Now: Researcher at Brigham and Women's Hospital.

10. (2012-2014) Christian M. Schneider, PhD in Physics, ETH Zürich, Switzerland.Now: Data Scientist at Dymatrix Consulting Group

11. (2012-2013) Vitaly Belik, PhD in Physics. Now: Research Associate, Technical University Berlin

12. (2011-2012) Pu Wang, PhD in Physics. Now Professor School of Traffic and Transportation Engineering, Central South University, Changsha, Hunan

## GRADUATE RESEARCH STUDENTS AT UC BERKELEY

1. Karl Reinhardt – M.S. / M.C.P. Transportation Engineering and City Planning "from September 2018" **

2. Zhe Fu – M.S. Transportation Engineering "from September 2018" **

3. Andrew Nelson – M.S. / M.C.P. Transportation Engineering and City Planning "from September 2018" **

## THESES SUPERVISED AT MIT

1. Philip Chodrow – PhD in Op. Res. "May 2020 expected"
2. Fahad Alhasoun – PhD in Computational Science and Engineering "May 2020 expected"
3. Adham Kalila – 2018 Big Data Fusion to Estimate Driving Adoption Behavior and Urban Fuel Consumption "M.Sc in Transp." *Graduate Student in Urban Planning, MIT.***
4. Sharon Xu – 2018 M.Sc. in Op. Res. "Modeling Human Dynamics and Lifestyles using Digital Traces" *Data Science in Trip Adviser.***
5. Siddharth Gupta – M.Sc in Trans 2017 "Estimating the presence of people in buildings using Call Detail Record" *Apple,Software Engineer.***
6. Steven Morse – M.Sc. in Op. Res. 2017 "Estimating the presence of people in buildings using Call Detail Records" *Instructor in the Department of Mathematical Sciences at the US Military Academy (West Point).***
7. Serdar Çolak – PhD in Transportation 2016 "Navigating Congested Cities: Understanding Urban Mobility Using New Data Sources" *Data Scientist at Lyft.*
8. Jameson Toole – PhD in Eng. Systems 2015 "Putting big data in its place : understanding cities and human mobility with new data sources" *Senior Data Engineer - Jana*
9. Lauren Alexander – M.Sc in Transportation 2015 "Cell phone location data for travel behavior analysis" *Manager, Product Analytics at Zipcar*
10. Suma Desu – M.Sc in Comp. Design and Opt. 2015 "Untangling Residential Segregation in Urban Areas" *Data Scientist at Apple*
11. Shannon Fast – M.Sc in Op. Res. 2014 "Pandemic panic : a network-based approach to predicting social response during a disease outbreak" *Health Informatics Analyst at HealthPartners*
12. Matthew E. Bradwick – M.Sc in Op. Res. 2012 "Belief propagation analysis in two-player games for peer-influence social networks"
13. Jane A. Evans – M.Sc in Op. Res. 2012 "Modeling social response to the spread of an infectious disease"
14. Yingxiang Yang – M.Sc in Transp. 2013 "Understanding human mobility patterns from digital traces" *PhD Candidate*
15. David Gerstle – M.Sc in Transp. 2012 "Understanding bus travel time variation using AVL data" *Associate at Booz Allen Hamilton*
16. Jameson Toole – M.Sc in Eng. 2012 "The diffusion of innovations in the presence of geography and media" *Senior Data Engineer - Jana*

17. Shannon Fast – M.Sc in Op. Res. 2014 "Pandemic panic : a network-based approach to predicting social response during a disease outbreak" *Health Informatics Analyst at HealthPartners*

18. Yan Ji – M.Sc in Civil Eng. 2014 "Understanding human mobility patterns through mobile phone records : a cross-cultural study" *PhD Candidate*

## UC BERKELEY PHD THESES COMMITTEE

- Yiyi He – Landscape Architecture and Environmental Planning "A Network Approach to Measuring Coastal Flooding Impact on Fuel Transportation Networks under the Changing Climate: A Case Study in SF Bay Area, CA" **
- Max Gardner – Civil& Env. Eng. "Understanding Intra-Urban Migration from Passively Collected Mobile Device Data" **

## MIT PHD THESES COMMITTEE

- Ahmad Alabdulkareem – Computational Science and Eng. 2018 "On the role of urban diversity on innovation"
- Shan Jiang – Urb. Stud. and Planning 2015 "Deciphering Human Activities in Complex Urban Systems –Mining Data for Sustainable Urban Future"
- Mehdi Akbarian – Civil& Env. Eng. 2015 "Model based pavement-vehicle interaction simulation for life cycle assessment of pavements"
- Tarek Rakha – Architecture 2015 "Towards comfortable and walkable cities : spatially resolved outdoor thermal comfort analysis linked to travel survey-based human activity schedules"
- M.J. Abdolhosseini Qomi – Civil& Env. Eng. 2015 "From atoms to cities : A bottom-up analysis of infrastructure materials and systems"
- Yi Zhu – Urb. Stud. and Planning 2014 "Spatiotemporal learning and geo-visualization methods for constructing activity-travel patterns from transit card transaction data"
- Christos Nicolaides – Civil& Env. Eng. 2014 "Dynamic processes on complex networks : from disease spreading to neural activity"
- Clio Andris – Urb. Stud. and Planning 2012 "Metrics and Methods for Social Distance"
- Enyang Huang – Civil & Env. Eng. 2012 "An Automated Security Analyzer For Payment Protocols"
- Maria Lavanya – Civil Eng. 2010 "Airline Schedule Planning and Operations: Optimization-based Approaches for Delay Mitigation"

## MENTORING UNDERGRADUATE RESEARCH

- Josefin L.Betsholtz – Civil Eng. 2015 "Enabling Efficient Energy Usage with Data Mining and Integrated Demand"

- Rucha Mehendale – Civil& Env. Eng. 2014-2015 "Analyzing Urban Data in the Context of Transportation Planning"
- Justine Jang – Civil& Env. Eng. 2014 "Improving Transportation Networks Using Mobile Phone Data"
- Deborah L. Chen – Civil& Env. Eng. 2011-2012 "Dynamic Land Use"

## SYNERGISTIC ACTIVITIES

- Editor: Frontiers in Physics (2018-now)**; Springer; Guest Editor Special issue in Urban Computing: "Data Mining and Knowledge Discovery", Springer (2016)**. Associate Editor IEEE Transactions on Big Data (IEEE TBD) (2015-now) Assistant Editor "Networks and Spatial Economics" (2010-2014)
- Referee: PNAS, Science, Nature Communications, Nature Human Behavior, PLoS ONE, Scientific Reports, Phys. Rev. Letters, Phys. Rev X, Phys. Rev. E, JSTAT, J. of Stat Mechs., Transp. Res. A, Trans. Res. C., Transportation, Comp. Phys. Comms., CHI, KDD ACM Urb. Comp.
- Visiting Committee:
  - Review of the Network Science Institute, Indiana University (December 2017)**
- Organizer:
  - Workshop From Many-Particle Physics to Multi-Agent Systems, Max-Planck Institute fuer Komplexe Systeme, Dresden, Germany (2004)
  - Neural Information Processing Systems (NIPS) Workshop: –Stochastic Models of Behavior, Vancouver, Canada (2008)
  - Workshop IEEE-SocialComp: Social Computing with Mobile Phones: Modeling, Sensing and Sharing", Vancouver, Canada (2009)
  - School and Conference NetSci (2010)
  - Satellite Urban Systems and Networks at NetSci (2014-present)
  - ASCE-EMI (Engineering Mechanics Institute), Symposium in Quantitative Sustainability (2015-present)
  - Symposium in Urban Systems at the Conference on Complex Systems (CCS) (2015-present).
  - Organizer of the Arab-American Frontiers of Science, sponsored by NAS-Kavli Frontiers of Science, Engineering, and Medicine program (November 2017).
  - Chair of BuildSys 2018: "The ACM International Conference on Systems for Energy-Efficient Built Environments"**
- Tutorial Instructor:
  - ICTP Workshop, School on Nonlinear Time Series Analysis and Complex Networks in the Big Data Era, Sao Paulo, Brazil, (2018)**
  - hEART: European Association for Research in Transportation, one day workshop at the Summer School, (2016)

  - Salina School in Complex Networks (2015)
  - Tutorial SPB13 (2013), International Conference on Social Computing, Behavioral-Cultural Modeling
  - Three-days Lecture: Curso de la Catedra Orange sobre Ciencia de las Redes (3rd Edition) ETSIT Universidad Politecnica de Madrid, Spain (2011).
  - Two-days Lecture: First Mobility Data Mining and Privacy (MODAP), Summer School Rhodes (2010).

- Program Committee:
  - BuildSys: "The ACM International Conference on Systems for Energy-Efficient Built Environments", 2016-now
  - UrbComp: "The International Workshop on Urban Computing (UrbComp 2013-now)" held in conjunction with ACM SIGKDD
  - "SIAM Data Mining" (SDM), 2017
  - NetMob: "Workshop on the Analysis of Mobile Phone Networks" (2010-2014)
  - CompleNet 2012, Workshop on Complex Networks"

- Society Membership:
  - American Society of Civil Engineers/Engineering Mechanics Institute (ASCE/EMI)
  - Transportation Research Board (TRB)
  - The Network Science Society
  - Complex Systems Society

## CONSULTING

- Scientific Advisory Board Member of Gran Data, Mobility Applications of Mobile Phone Technologies
- Pecan Street Research Institute, Adoption of Solar Energy (Scientific Advisory Board Member).
- Scientific Advisory Board Member of Cuebiq, Mobile phone technologies
- Consultant of Cambridge Systematics, Use of passive records to extract transportation demand models (2014-2016)
- Consultant of Steer Davis Gleaves, Use of phone data for transit applications (in progress)
- Consultant of AirSage, Inc., Mobility Applications of Mobile Phone Technologies (2010-2016)

## VISITING SCIENTIST

1. Fundação Getulio Vargas, Applied Mathematics Department, Rio de Janeiro, Brazil (Summer 2015).
2. Austrian Institute of Technology, Mobility Department, Vienna, Austria (Summers 2011 and 2012).
3. Sprint Research Labs, Burlingame, CA (Summer 2008).

## HONORS AND AWARDS

- Selected speaker by the U.S. National Academies to Sackler Colloquium on Visualization and Modelling on advances of Science and Technology (2017)
- Selected by the U.S. National Academies of Sciences, Engineering and Medicine, as the organizer of the Smart Cities symposium for of the Fifth Arab American Frontiers meeting (2017)
- Scientific Advisory Board Member of PTV AG, leading software solutions and consulting services for traffic and transportation (2017-2018).
- UN Foundation award to study consumption patterns of women and girl in the developing world (2016)
- Bill and Melinda Gates Foundation award to study access to financial services in the developing world (2016)
- Invited Speaker, National Academy of Sciences meeting on "Data-driven City Planning and Policy," from the Committee on Applied and Theoretical Statistics (2016)
- Winner of the MIT-Philips Lighting Grand Challenge (w. Post-doc) (2016)
- Invited Speaker, National Academy of Engineering meeting -AAES Convocation of the Professional Engineering Societies on "Big Data in Civil Engineering" (2015)
- 1st Prize MIT Big Data Transportation Challenge "Prediction Algorithms" (w. Students) (2013)
- 2nd Prize, MIT Big Data Transportation Challenge "Visualization Platform." (w. Student) (2013)
- Best Paper Award in the ACM SIGKDD International Workshop on Urban Computing, KDD'13, Chicago. (w. Students)
- Invited Speaker, NAE Annual Frontiers of Engineering (2013)
- Best Paper Award in the ACM SIGKDD International Workshop on Urban Computing, KDD'12, Beijing. (w. Students)
- Gilbert Winslow Career Professorship at MIT (2012)
- Selected Participant in the National Academies Keck Futures Initiative on Complexity (2008)
- 2002-2006 DAAD Scholarship (Germany) for Doctoral Studies

## TEACHING

- Graduate class at UC Berkeley: "Urban Systems and Network Science", open since the Spring 2018. It covers methods to analyze human dynamics, and their interactions with the built and the natural environment. Examples include: Transportation and mobility networks, Internet, mobile phone networks, power grids, social and contact networks, are all examples of spatial networks. Via the analysis of empirical datasets, we identify important nodes in networks,

detect communities, trace network flows, and test models for the data set. When their size allows us, we create informative visualizations. Programming language is Python.

- Undergraduate class at MIT "Urban Networks", taught from the Spring 2013 to the Fall 2017. This class introduces basic concepts of data analysis, visualization and modeling. Topics include network models, analysis of network properties, and analysis of spatial data. The class introduces the undergraduate population in Engineering and Urban Planning to the field of network science. Students learn to analyze a large data set of their choice as a networked system. Activities include: (1) selection of research papers to motivate their research, (2) write a journal style research paper and (3) present their results in front of their peers.

- Graduated class at MIT and UC Berkeley, titled: "Computer Modeling: From Human Mobility to Transportation Networks" taught since the Spring 2010. This class teaches methods that extract useful information from digital traces of human activity. It covers numerical methods to cluster the structure inherent in daily activities within a population. Lectures are reinforced with case studies and exercises, using data sets from actual applications. It attracts students from Civil and Environmental Engineering, Urban Studies and Planning, Engineering Systems, Media Art and Sciences and Architecture. Through the term students: (1) write a journal style research paper, (2) give a recitation in a unit of their choice and (3) present their results orally in a conference setting in front of their peers. This has led to several advanced final projects, resulting in several conference and journal publications, master theses and chapters of PhD theses, including a best paper award, all from work started in the classroom.

- The educational material for these courses is available at: http://humnetlab.mit.edu/teaching/. We also share data sets and codes via a github account:http://humnetlab.mit.edu/downloads/.

## MEDIA

The media has been particularly receptive of making stories. Our work in urban mobility, epidemic spreading, urban traffic, twitter adoption and detection of unemployment has been covered by diverse media outlets or science writers in: the MIT News Spotlight, Fortune, the Boston Globe, Nature Asia, IEEE Spectrum, The Atlantic, NewScientist, WiredUK, dailymail.co.uk, msnbc.com, mashable.com, daily.wired.it, Science, Nature Physics, NSF, BBC, Scientific American, PhysOrg, Science Now, IEEE Magazine, Nature News, The New york Times, The Wall Street Journal, Voice of America, Le Figaro, BBC News, The Press Association, Berliner Zeitung, AFP, SmartBrief, BBC Mundo, El Diario, Radio Coperativa, Reuters Canada,ajc.com, CBC News, La Repubblica, 20minutes, Terra España, Scotsman, inthenews, nzherald, AndhraNews, Thaindian News, Newswise, news.com.au, The World Econic Forum, among others.