

# Luis Guillermo Natera Orozco

## Data Analyst

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Motivated, interdisciplinarity team-work oriented, and responsible Data Analyst with significant experience working in urban mobility and data analysis. Highly educated, Ph.D. in Network Science from the Central European University, where I developed new data methods for the analysis of large-scale urban mobility network data, along with the designing of new algorithms to quantify urban liveability and connectivity improvement for bicycle infrastructure networks.

I am interested in data analysis as an engine to improve the world, and face the future challenges that we will face as humanity such as climate change, increased connectivity, and pollution.

## TECHNICAL SKILLS

### Data management

PostgreSQL, PostGIS, Data Analysis, Pattern & Trend Identification, Data Visualization, Data wrangling with Python

### Computational tools

Python (+5 years experience), Jupyter Notebooks & Jupyter Lab stack, GeoPython stack (GeoPandas, MovingPandas, Kepler, H3, OSMnx, Google Maps API), Sci-kit learn, Django (intermediate), HTML (intermediate), CSS (intermediate), Javascript (beginner), SQL (intermediate),  $\text{\LaTeX}$  (intermediate), Git + {GitHub, GitLab, Bitbucket}, Ci/Cd, AWS (RDS, S3, EC2), Tableau (intermediate)

### Research methods

Urban planning, Network & Data science research methodologies, Data mining, Statistical analysis

## WORK EXPERIENCE

### Agglomeration and Social Networks Research Lab

Research fellow  
07/2021 - 11/2021

#### Urban mobility and COVID-19

**Data analyst.** Analyzed GPS mobility data to provide insights regarding the impact of COVID-19 in the urban mobility of Budapest.

## **Cities Observatory (ITESM)**

Data and network science consultant

05/2020 - 11/2021

### **Accessibility and mobility analysis**

**Project manager & Data analyst.** Coordinate with the data science team the development of a methodology to measure urban accessibility in 75 Mexican cities using open data. The findings are currently being used to lobby local governments to improve the urban conditions.

### **Air quality during COVID-19 pandemic lockdown**

**Project manager.** Coordinated a team of researchers to design and develop a methodology to measure the changes in air quality for the cities of Mexico City, Guadalajara, and Monterrey during the COVID-19 lockdowns.

## **LAC\_analytics**

Co-founder

01/2020 - 11/2021

### **City Intelligence**

**Project manager & Developer.** Coordinated the development of a data-driven web platform and API for the analysis of cities and amenities. Some applications of the platform and the data are: location intelligence for real estate, traffic, and public transport, and the analysis of the urban mobility of the city.

### **Evaluation of air quality and urban environment**

**Data analyst.** Analysis and data visualization for air quality data in the area where a new public transport system is being built. This project was a collaboration within multiple actors, including Google.org, and the Government of Jalisco.

## **Central European University**

Ph.D. Researcher

08/2017 - 11/2021

### **Multimodal Fingerprint of Urban Transportation Networks**

**Data scientist & analyst.** Development of computational methods for the analysis of urban form in multiple cities. The methods were used to identify patterns in urban mobility infrastructure, and to provide insight on the future of the cities.

### **Bicycle infrastructure network analysis**

**Data scientist & analyst.** Research and design of algorithms to evaluate and improve the connectivity of bicycle infrastructure networks. The algorithms were applied to fifteen different cities in the world, and the results were published in the journal Royal Society Open Science.

### **Quantifying life quality as walkability**

**Data scientist & analyst.** Analysis of pedestrian urban accesibility metrics to quantify the liveability of a given city. The project was developed for the Budapest municiplity as part of a strategy to dectect oportunities around the city and to develop data-driven public policies.

### **Signa\_Lab**

Executive Coordinator

08/2016 - 08/2017

#### **Online social networks analysis**

**Project manager & Data analyst.** I coordinated the research and development of methodologies to analyze social media data (Twitter, Facebook, and Youtube) to identify patterns and trends in online political conversation.

### **Mesura**

Networks Analyst

10/2015 - 08/2017

#### **Online social networks analysis**

**Data analyst.** Worked with multinational clients to analyze and improve their social media presence. I developed tools to automatize the data collection with the use of APIs.

### **IMTJ (Mobility Institute of the State of Jalisco)**

Analyst

1/2014 - 10/2014

#### **Sustainable urban mobility**

**Public policy analyst** Worked with a team of urban and mobility planners to develop the public policies and technical specifications for the operation of the first bike share system in Guadalajara, Jalisco. México.

### **Colectivo Triciclo**

Co-Founder, Principal Architect

8/2010 - 1/2014

#### **Architecture and urban design**

**Architect.** Co-founder of my own architecture studio. I was responsible for the design of private houses and the development of urban interventions, such as a pop-up neighborhood reading kiosk.

## OTHER WORK EXPERIENCE

### Teaching

07/2017 - 09/2021

#### **Python for Social Scientist**

I have taught introductory Python courses for social scientists in multiple places, such as Leibniz Institute for the Social Sciences, European Consortium of Political Research, and the Central European University.

#### **Introduction to Network Science**

I have developed and taught introduction courses to Network Science for non-technical people in interdisciplinary settings. Such courses were developed to facilitate the understanding of complex systems in a friendly and interactive way.

## EDUCATION

- Ph.D.      Network Science, Central European University, Budapest, Hungary. 2021
- M.A.      Communication of Science and Culture, ITESO, Tlaquepaque, Mexico. 2015  
            **Academic Visit.** Center for Civic Media, MIT Media Lab, Boston, USA. 2015
- B.Arch.    Architecture, ITESO, Tlaquepaque, Mexico. 2010  
            **Academic Visit.** Universidad de Valparaíso, Valparaíso, Chile. 2012

## AWARDS

- 2020      Award for Advanced Doctoral Students. Central European University
- 2019      Best lightning talk award. International Conference in Complex Networks and their Applications.

## LANGUAGES

- Spanish    Native
- English    Professional proficiency

Updated December 2021

## APPENDIX

### ACADEMIC PUBLICATIONS

- 2020 Natera Orozco, L. G., Battiston, F., Iñiguez, G., Szell, M. "Data-driven strategies for optimal bicycle network growth" *Royal Society Open Science*, 2020. 7: 201130.  
<https://doi.org/10.1098/rsos.201130>
- 2020 Natera Orozco, L.G., Battiston, F., Iñiguez, G., Szell, M. "Extracting the multimodal fingerprint of urban transportation networks" *Transport Findings*, 2020.  
<https://doi.org/10.32866/001c.13171>
- 2019 Natera Orozco, L. G., Deritei, D., Vancso, A., Vasarhelyi, O. "Quantifying life quality as walkability on urban networks" In: Cherifi H., Gaito S., Mendes J., Moro E., Rocha L. (eds) *Complex Networks and Their Applications VIII. COMPLEX NETWORKS 2019. Studies in Computational Intelligence*, 2019, pp. 905–918.
- 2019 Natera Orozco, L. G. "Un cambio de la comunicación gubernamental y política. De los medios de comunicación a las redes sociales." *Informe Anual Q Medios 2018*, edited by Bernal, G. Jalisco, Mexico: ITESO.
- 2018 Natera Orozco, L. G., Reguillo, R. "Comunicación y cambio social: participación política e internet en Jalisco" *Enciclopedia Jaliscience de la Comunicación.*, edited by Orozco, G., Reguillo, R. Jalisco, Mexico: Universidad de Guadalajara.
- 2016 Natera Orozco, L. G., (as Signa\_Lab) "Battle of the hashtags: Mapping the online conversation surrounding Mexico's gas price" *Global Voices*.
- 2014 Natera Orozco, L. G. "Comunicación, ciudad e internet: flujos de información urbana en entornos digitales" VI Seminario Internacional de Investigación en Urbanismo. Bogota, Colombia.

### Manuscripts in Preparation and Development

- 2021 Natera Orozco, L. G., Alessandretti, L., Szell, M., Battiston, F. "Multimodal transportation and mobility in urban networks" Under review at *Transportation*
- 2021 Tupikina, L., Natera Orozco, L. G., Battiston, F. "A comparative analysis of station and dockless bike share systems."

### CONFERENCE AND INVITED TALKS

- 2021 *Invited talk*: Bauhaus-Universität Weimar, Germany.
- 2021 *Invited talk*: URBANUM. Budapest, Hungary.
- 2021 *Invited talk*: Graph data science. Manning Publications.
- 2020 *Invited talk*: Science, Technology and Innovation Council. Hidalgo, Mexico.
- 2020 *Invited talk*: Neo Urban Networks Workshop. Paris, France.
- 2020 *Invited talk*: PIP Ciudad Futuro. Guadalajara, Mexico.

- 2019      *Conference:* VIII Conference in Complex Networks and their Applications. Lisbon, Portugal.
- 2019      *Invited talk:* Data Science MeetUp. Timisoara, Romania.
- 2019      *Invited talk:* FabLab, West University of Timisoara. Timisoara, Romania.
- 2019      *Conference:* Cycling Research Board Meeting. Delft, Netherlands.
- 2019      *Invited talk:* 4D Cities, Multi-Actor Systems Department, TU Delft. Delft, Netherlands.
- 2019      *Invited talk:* Mobile and Social Computing Lab, Fondazione Bruno Kessler. Trento, Italy.
- 2019      *Conference:* The Network Science Society Conference. Burlington, USA.
- 2019      *Invited talk:* ANET-Talks, ANET Lab, Hungarian Academy of Science. Budapest, Hungary.
- 2018      *Invited talk:* Signa\_Lab, ITESO. Tlaquepaque, Mexico.
- 2018      *Conference:* SICC Workshop ComplexCity@PoliTo. Turin, Italy.
- 2015      *Invited talk:* Encuentro de Urbanismo Alternativo, Centro Cultural de España en México. Mexico City, Mexico.
- 2015      *Invited talk:* II Simposio de ciudades y territorios incluyentes “Derecho a la Ciudad”, Universidad Autónoma de Yucatán. Merida, Mexico.
- 2013      *Conference:* Future of Places. Stockholm, Sweden.

## **GRANTS AND FELLOWSHIPS**

- 2020, 21    Write-up grant. Central European University
- 2019      Registration grant. International Conference in Complex Networks and their Applications
- 2019      Ph.D. conference travel grant. CEU Budapest Foundation
- 2019      Registration grant. NetSci
- 2018, 19    Travel grant. Department of Network and Data Science, Central European University
- 2017–20    Doctoral grant. Central European University.
- 2015      Academic Stay at MIT. Mexican National Council of Science and Technology
- 2013      Master Studies Grant. Mexican National Council of Science and Technology

## **DETAILED TEACHING EXPERIENCE**

### **GESIS – Leibniz Institute for the Social Sciences**

- 2021      Introduction to Computation Social Sciences with Python. GESIS Fall Seminar in Computational Social Science. Co-taught with Orsyola Vásárhelyi

### **European Consortium for Political Research**

- 2021      Teaching Assistant, Python Programming for Social Scientists. Summer Virtual Methods School 2021

- 2021      Teaching Assistant, Python Programming for Social Scientists. Winter Virtual Methods School 2021
- 2020      Teaching Assistant, Python Programming for Social Scientists. Summer Virtual Methods School 2020

### **Central European University**

- 2020      Teaching Assistant, Scientific Python
- 2019      Teaching Assistant, Statistical Methods in Network Science

### **ITESO**

- 2019      Network Science (Summer 2019) Invited lecturer, co-taught with Diego Arredondo (ITESO)
- 2017      Network Science (Summer 2017) Co-taught with Emma Towlson (Northeastern University), Sean P. Cornelius (Northeastern University), and Ricardo Zavala (ITESO)
- 2015–17   Communication, Culture and Society (Spring 2016, 2017)
- 2015–16   Social Systems Theory (Fall 2015, 2016)