

Sofia Gil-Clavel, Ph.D.

Actuarial, Computer, and Computational Social Scientist

PhD in Computational Social Science

Interests: Statistics, Machine Learning, Digital Data, & Climate Change



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WORK EXPERIENCE

Post Doctoral Fellow Human Adaptation to Climate Change [Jul.2022 – current]

TU Delft [Delft, Netherlands]

Retrieval and analysis of peer-reviewed articles' text to study humans' adaptation to climate change. Specifically, I use Natural Language Processing, network visualization, and statistical analysis to study the socio-economic factors associated with adaptation to climate change.

PhD Fellow Computational Social Science [Sep.2018 – Jun.2022]

Max Planck Institute for Demographic Research [Rostock, Germany]

My PhD projects relied on analyzing data retrieved using Facebook and Twitter Application Programming Interfaces (APIs), through statistical and longitudinal methods and natural language processing. My main dissertation projects were focused on Europe, specifically on the study of family ties; immigrants' cultural integration; and older people's use of information and communication technologies to maintain friendships.

Principal Analyst [Aug.2017 – Aug.2018]

Department of Demographic Analysis, National Population Council (CONAPO) [Mexico City, Mexico]

Creation of computational tools to visualize and analyze Mexican conciliation data (1950-2015) and the Mexican projected population (2016-2050). Demographic data analysis of population, deaths, births, and migration. I programmed and uploaded (Linux servers) the first version (2018) of the shiny app to visualize these data ([link](#)). During this period, I also worked on the project presented at SOMEDE: "Estimation of the infant mortality rate in Mexico in 2015 at municipal level using numerical techniques."

Research Analyst [Aug.2014 – Aug.2015]

Center of Demographic, Urban, and Environmental Studies (CEDUA) of COLMEX [Mexico City, Mexico]

Development of the R package "DemosR: Package for the Stochastic Population Forecast" (COLMEX internal use). Analysis and handling of big data for demographic research.

Student Assistant: Teacher in BSc degree [Aug.2013 – Aug.2015]

Helped preparing the teaching material, teaching, and grading.

- *Calculus*. El Colegio de México. [Aug.2014 – Aug.2015]
- *Statistics*. National Autonomous University of Mexico. [Jan.2014 – Aug.2014]
- *Probability*. National Autonomous University of Mexico. [Aug.2013 – Aug.2014]

EDUCATION

PhD in Computational Social Science [Sep.2018 – Aug. 2023]

Digital and Computational Demography Laboratory, Max Planck Institute for Demographic Research, Germany & Faculty of Spatial Sciences. University of Groningen, Netherlands.

Thesis: “Studying Social Interactions Using Digital Trace Data: the Cases of Older Adults, Migrants, and Family Ties”.

Supervisors:

Prof. Dr. Emilio Zagheni & Prof. Dr. Clara H. Mulder

Graduate level education

IMPRS-PHDS: International Max Planck Research School for Population, Health and Data Science, Germany. [Sep.2019 – Aug.2023]

CAnD3: Consortium on Analytics for Data-Driven Decision-Making, Canada. [May 2021 – Jun.2022]

Computer Science (MSc) [Aug.2015 – Aug.2017]

Center of Mathematics Research (CIMAT), Mexico.

Specialization in Computing and Industrial Mathematics.

Thesis research used and optimized techniques for geo-spatial analysis, such as Autoregressive Spatial models.

Actuarial Science (BSc) [Aug.2009 – Aug.2014]

National Autonomous University of Mexico (UNAM), Mexico.

PUBLICATIONS

Peer Reviewed

Gil-Clavel, S., Grow, A., & Bijlsma, M. J. (2023). “Migration Policies and Immigrants’ Language Acquisition in EU-15: Evidence from Twitter.” *Population and Development Review*.

<https://doi.org/10.1111/padr.12574>

Kashyap, R., Rinderknecht, R. G., Akbaritabar, A., Alburez-Gutierrez, D., **Gil-Clavel, S.**, Grow, A., Kim, J., et al. (2023). “Digital and computational demography.” In *Research Handbook on Digital Sociology* (pp. 48-86). Edward Elgar Publishing. <https://doi.org/10.4337/9781789906769>

Grow, A., Perrotta, D., Del Fava, E., Cimentada, J., Rampazzo, F., **Gil-Clavel, S.**, Zagheni, E., Flores, R.D., Ventura, I. and Weber, I. (2022). “Is Facebook's advertising data accurate enough for use in social science research? Insights from a cross-national online survey.” *Journal of the Royal Statistical Society Series A*, 185(S2), S343-S363. <https://doi-org.tudelft.idm.oclc.org/10.1111/rssa.12948>

Gil-Clavel, S., Zagheni, E., & Bordone, V. (2021). “Close social networks among older adults: the online and offline perspectives”. *Population Research and Policy Review*, 1-25. <https://link.springer.com/article/10.1007/s11113-021-09682-3>

Gil-Clavel, S., & Zagheni, E. (2019). “Demographic Differentials in Facebook Usage around the World”. *Proceedings of the International AAAI Conference on Web and Social Media*, 13, 647–650. Retrieved from <https://ojs.aaai.org/index.php/ICWSM/article/view/3263>

- Del Fava, E., Cimentada, J., Perrotta, D., Grow, A., Rampazzo, F., **Gil-Clavel, S.**, & Zagheni, E. (2021). "Differential impact of physical distancing strategies on social contacts relevant for the spread of SARS-CoV-2: evidence from a cross-national online survey", *BMJ open*, 11(10), e050651.
- Perrotta, D., Grow, A., Rampazzo, F., Cimentada, J., Fava, E. D., **Gil-Clavel, S.**, & Zagheni, E. (2021). "Behaviors and attitudes in response to the COVID-19 pandemic: Insights from a cross-national Facebook survey". *EPJ Data Science*, 10(17), 13. <https://doi.org/10.1140/epjds/s13688-021-00270-1>
- Grow, A., Perrotta, D., Fava, E. D., Cimentada, J., Rampazzo, F., **Gil-Clavel, S.**, & Zagheni, E. (2020). "Addressing Public Health Emergencies via Facebook Surveys: Advantages, Challenges, and Practical Considerations". *Journal of Medical Internet Research*, 22(12), 12. <https://doi.org/10.2196/20653>
- Alburez-Gutierrez, D., Zagheni, E., Aref, S., **Gil-Clavel, S.**, Grow, A., & Negraia, D. V. (2019). "Demography in the Digital Era: New Data Sources for Population Research." In *Smart Statistics for Smart Applications: Book of Short Papers SIS2019* (Arbia, Giuseppe, et al.). Pearson. <https://osf.io/24jp7>

Working Papers

- Gil-Clavel, S.**, Wagenblast, T., and Filatova, T. (2023, November 24). "Farmers' Incremental and Transformational Climate Change Adaptation in Different Regions: A Natural Language Processing Comparative Literature Review." Preprint. SocArXiv. <https://doi.org/10.31235/osf.io/3dp5e>.
- Gil-Clavel, S.**, & Filatova, T. (2023). "Using Natural Language Processing and Networks to Automate Structured Literature Reviews: An Application to Farmers Climate Change Adaptation." *arXiv preprint arXiv:2306.09737*. <https://arxiv.org/pdf/2306.09737.pdf>
- González-Leonardo, M., Neville, R., **Gil-Clavel, S.**, & Rowe, F. (2023, April 28). "Sensing population displacement from Ukraine using Facebook data: Identifying potential settlement areas within host countries." *OSF Preprints*: 10.31219/osf.io/5ag8s. <https://doi.org/10.31219/osf.io/5ag8s>
- Gil-Clavel, S.**, & Mulder, C. H. (2023, February 6). "Does Twitter data mirror the European North-South family ties divide? A comparative analysis of tweets about family." *OSF Preprints*: 10.31219/osf.io/c379h. <https://doi.org/10.31219/osf.io/c379h>

SUPERVISION EXPERIENCE

PhD Students

- Thorid Wagenblast (2022–current). "Social and Policy Tipping Elements in Transformational Climate Change Adaptation." TU Delft. Netherlands. Main Supervisor: Prof. Tatiana Filatova. Co-advisor: Dr. Sofia Gil-Clavel.

Master Students

- Kaninik Baradi (2024). "Ex-ante Measurement of Procedural Justice in Climate Change Adaptation." TU Delft. Netherlands. Main Supervisor: Prof. Amineh Ghorbani. Daily-Supervisor: Dr. Sofia Gil-Clavel.
- George Gittins (2024). "Extracting Institutional Grammar Norms from Questionnaire Data for Agent-Based Models." TU Delft. Netherlands. Main Supervisor: Prof. Amineh Ghorbani. Daily-Supervisor: Dr. Sofia Gil-Clavel.
- Camila Montiel González (2023–2024). "Facebook versus encuestas de hogares: oportunidades y límites de los datos de Facebook para el estudio de la migración internacional en América Latina."

Universidad de la República, Facultad de Ciencias Sociales. Uruguay. Main Supervisor: Prof. Victoria Prieto Rosas. Co-Supervisor: Dr. Sofia Gil-Clavel.

Bachelor Students

- Main supervisor of 5 bachelor students (2024). Project name “From intention to adoption of green energy: Demographic, Cultural, and Economic differences in the EU.”

TEACHING EXPERIENCE

Workshops on Digital Data: Use, Retrieval, and Analysis [Jan.2019 – current]

Fully prepared a 3-hours workshop that aims to give a general overview on the use of digital data for population research, and how to use application programming interfaces to download digital data from diverse social media platforms. The course has been followed by bachelor, master, and doctoral students, as well as professors from different international institutions and it has received very good reviews.

- Centro de Investigación en Matemáticas, Mexico. [Oct. 2023]
- El Colegio de México, Mexico ([link](#), [link](#)). [Sep. 2023 & Apr. 2022]
- Max Planck Institute for Demographic Research, Germany ([link](#)). [Oct. 2019]
- Instituto de Economía, Geografía y Demografía, Spain ([link](#)). [Jun. 2019]

Student Assistant Teacher in BSc degree [Aug.2013 – Aug.2015]

Helped preparing the material, teaching, and grading.

- *Calculus*. El Colegio de México. [Aug.2014 – Aug.2015]
- *Statistics*. National Autonomous University of Mexico. [Jan.2014 – Aug.2014]
- *Probability*. National Autonomous University of Mexico. [Aug.2013 – Aug.2014]

Mathematics Teacher [Aug. 2007 – Jul. 2008]

Teach fundamental mathematics to people from different ages.

National Mathematics College (CONAMAT), Mexico.

PROFESSIONAL ACTIVITIES

Invited as an expert in the use of Social Media Data to contribute to the update of TU Delft “Guidelines for Research Data/Software Management.” Organized by Asya Kochkurova, TU Delft library Project Manager. February 2024.

Invited speaker at “Bridging the Gap: Integrating Historical Knowledge and Complex Human-Environmental System Modelling,” at the Max Planck Institute of Geo-anthropology, to present “Use of Natural Language Processing and Networks to study individuals’ factors of Climate Change Adaptation” ([link](#)). Germany. December 2023.

Organized the session “Uso de Datos Digitales en el Estudio de la Movilidad y la Migración Humana” at “Primer Seminario Sobre Gestión y Generación de Datos Sociodemográficos”, Universidad Autónoma del Estado de México. Invited speakers: Prof. V. Prieto Rosas, Prof. F. Rowe, Dr. D. Perrotta, and PhD Candidate C. Coimbra Vieira. Mexico. October 2023.

Invited speaker at “Primer Seminario Sobre Gestión y Generación de Datos Sociodemográficos,” Universidad Autónoma del Estado de México, to present “Estudio de las interacciones sociales mediante datos digitales: Los Casos de las Personas Adultas Mayores y los Inmigrantes.” Mexico. October 2023.

Invited speaker at Centro de Investigación en Matemáticas (CIMAT) to present “Estudio de las interacciones sociales mediante datos digitales: Los Casos de las Personas Adultas Mayores y los Inmigrantes.” Mexico. October 2023.

Gave a workshop at Centro de Investigación en Matemáticas (CIMAT): *Datos Digitales: uso, descarga y análisis*. October 2023.

Gave a workshop at El Colegio de Mexico as part of the permanent seminar Migración Desigualdad y Políticas Públicas. “Taller de Datos Digitales: Uso, Descarga, y Análisis” ([link](#)). Mexico. September 2023.

Invited speaker at the Department of Methodology and Statistics of Tilburg University to present “Big Data as a Data Source for Research: The Case of Facebook Data.” Netherlands. March 2023.

Invited speaker at the Permanent Seminar ‘Aplicaciones de ciencia de datos en las ciencias sociales y las humanidades’ of El Colegio de México. Presentation: “La asociación entre las políticas de integración cívica y de ciudadanía con el uso de la lengua de destino de los inmigrantes de la UE-15: Uso de datos de Twitter para analizar la adquisición de idiomas” (You can find the video [here](#)). November 2022.

Gave a workshop at El Colegio de Mexico “V Coloquio Internacional Estudiantil en Población, Ciudad y Ambiente”: *Uso de APIs para la descarga de datos* ([link](#)). April 2022.

Invited as discussant at the panel “Machine learning in the social sciences” of the *MigrantLife Symposium* ([link](#)). March 2022.

Invited as discussant at the panel “Digital Traces for demographic knowledge” of the *Population Studies Association of Argentina* (AEPA) ([link](#)). October 2021.

Invited to the roundtable Demographic Research with Web and Social Media Data at the *Latin American Population Association*, organized by Diego Alburez-Gutierrez. You can find the video [here](#).

Gave a training Workshop on “Using the Facebook Application Programming Interface” at the Max Planck Institute for Demographic Research ([link](#)). October 2019.

Gave a [training Workshop](#) at IUSSP Digital Demography in the Era of Big Data Pre-Workshop: *Demography Today Training* ([link](#)). June 2019.

Organizer at the ICWSM 2019 Workshop: *Demographic Research with Web and Social Media Data* ([link](#)). June 2019.

Other Professional Activities:

- Launched Reading Club at the SC3 Group of TU Delft. [Apr. 2023 – current]
- Co-launched Peer-Review Workshop at the IMPRS-PHDS. [Aug.2020 – Apr.2022]
- Elected PhD Core Representative at the IMPRS-PHDS. [Nov.2019 – Jun.2022]
- Elected PhD External Representative at the MPIDR. [Jun.2020 – Jun.2021]

SCHOLARSHIPS & GRANTS

- Scholarship of 10,000EUR from the Mexican National Council of Science and Technology (CONACyT) to study Computer Science at CIMAT. [Aug.2015 – Aug.2017]
- Scholarship from CIMAT to participate in their “6th Summer School on Probability and Statistics”, and to work on a research project with Prof. Rogelio Ramos Quiroga, CIMAT. [July 1st to July 12th, 2013]

PRESENTATIONS AT CONFERENCES

I have presented my work at major international conferences, such as (*complete list in Appendix A*):

- Open Data Infrastructure for Social Science and Economic Innovations (ODISSEI)

- Tipping Points Conference
- European Population Conference
- International Population Conference
- International Migration, Integration and Social Cohesion in Europe
- Population Association of America
- International Conference on Web and Social Media
- Mexican Society of Demography

SKILLS

Statistical Analysis: R, Python.

Programming: Python, R, C++, VBA.

Text processing: LATEX, R-Markdown, Jupyter.

Data visualization and exploration: R (shiny, ggplot, plotly), Python (matplotlib), Gephi.

AI Ecosystem: Prodigy, Spacy, TensorFlow, PyTorch, Hugging Face.

Application Programming Interfaces (APIs): Facebook, Twitter, Scopus, DeepL, etc.

Languages: Spanish (native), English (advanced), Dutch (partner's mother tongue), German (basic).

REFERENCES

- Prof. Dr. Tatiana Filatova:
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 - TU Delft; Faculty of Technology, Policy and Management; Jaffalaan 5, 2628 BX Delft, The Netherlands
- Prof. Dr. Clara H. Mulder:
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 - University of Groningen; Faculty of Spatial Sciences; Landlevan 1, 9747 AD Groningen, The Netherlands
- Prof. Dr. Emilio Zagheni:
 - zagheni@demogr.mpg.de
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 - Max Planck Institute for Demographic Research; Konrad-Zuse-Str. 1, 18057 Rostock, Germany
- Prof. Dr. Víctor Manuel García-Guerrero:
 - vmgarcia@colmex.mx
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 - El Colegio de México; Centro de Estudios Demográficos, Urbanos, y Ambientales; Camino al Ajusco No. 20, Col. Pedregal de Santa Teresa, Del. Tlalpan, C.P. 14200, México city, México.

Appendix A: Complete list of Presentations at Conferences

Sofia Gil-Clavel, André Grow, Maarten J. Bijlsma, “Migration Policies and Immigrants’ Language Acquisition in EU-15: Evidence from Twitter”. Poster Presentation at Open Data Infrastructure for Social Science and Economic Innovations (ODISSEI) 2023. Netherlands. November 2023.

Sofia Gil-Clavel, Tatiana Filatova, “Farmers’ Adaptation to Climate Change: a Natural Language Processing Systematic Review”. Poster Presentation at Open Data Infrastructure for Social Science and Economic Innovations (ODISSEI) 2023. Netherlands. November 2023.

Sofia Gil-Clavel, Tatiana Filatova, “Farmers’ Adaptation to Climate Change: a Natural Language Processing Systematic Review”. Presentation at Latin American Researchers Day 2023. Event organized by LATITUD in collaboration with the Mexican and Colombian embassies. Netherlands. June 2023.

Sofia Gil-Clavel, Clara Mulder, “Do Tweets Mirror the European North-South Family Ties Division?” Presentation for Dutch Demography Day. Session: Poster Pitch. Netherlands. November 2022.

Sofia Gil-Clavel, Tatiana Filatova, “Transformational Adaptation to Floods at Micro and Macro Level - an AI Systematic Review.” Poster Presentation at The Art of Scientific Computing. TU Delft. Netherlands. September 2022.

Sofia Gil-Clavel, André Grow, Maarten J. Bijlsma, “Analyzing EU-15 Immigrants’ Language Acquisition using Twitter Data”. Poster Presentation at The Art of Scientific Computing. TU Delft. Netherlands. September 2022.

Sofia Gil-Clavel, Tatiana Filatova, “Transformational Adaptation to Floods at Micro and Macro Level - an AI Systematic Review.” Poster Presentation at Tipping Points Conference: From Climate Crisis to Positive Transformation. United Kingdom. September 2022.

Sofia Gil-Clavel, André Grow, Maarten J. Bijlsma, “EU-15 Immigrants Language Integration on Twitter”. Poster presented at European Population Conference (EPC). Netherlands. Poster Café. June 2022.

Sofia Gil-Clavel, André Grow, Maarten J. Bijlsma, “EU-15 Immigrants Language Integration on Twitter”. Presentation for Population Association of America (PAA). Session Flash: New Data and Methods in Migration Research. April 2022.

Sofia Gil-Clavel, Clara Mulder, “What do Europeans tweet about family before and after moving?” Presentation at MigrantLife Symposium 2022. Session: Work, Family Life, and Employment. March 2022.

Sofia Gil-Clavel, André Grow, Maarten J. Bijlsma, “EU-15 Immigrants Language Integration on Twitter”. Presentation for International Population Conference (IPC). Session 193: Us vs Them: Cultural Assimilation and Anxieties in the Modern World. December 2021.

Sofia Gil-Clavel, André Grow, Maarten J. Bijlsma, “EU-15 Immigrants Language Integration on Twitter”. Presentation for Dutch Demography Day. Session: Poster Pitch. November 2021.

Sofia Gil-Clavel, “Immigrants’ Cultural Integration Patterns in Spain, Germany, and the UK: Tweets as Expressions of Context.” Presentation for IMISCOE General Conference. Session: Migrant Transnationalism 13. July 2021.

Sofia Gil-Clavel, “EU-15 Immigrants Language Integration on Twitter”. Poster presentation for the IMPRS-PHDS Graduate Workshop. June 2021.

Sofia Gil-Clavel, Emilio Zagheni, and Valeria Bordone, “Close Social Networks among Older Adults: The Online and Offline Perspectives.” Accepted presentation for PAA. Flash session: Social Networks, Social Support, and Health. May 2021.

Sofia Gil-Clavel, “Immigrants’ Cultural Integration Patterns in Spain, Germany, and the UK: Tweets as Expressions of Context”. Presentation for IMISCOE Spring Conference. Session: Messaging Migration on and Through Social Media. March 2021.

Sofia Gil-Clavel, Emilio Zagheni and Valeria Bordone, “Close Social Networks among Older Adults: The Online and Offline Perspectives.” Presentation for the Dutch Demography Week. Session: Families in later life. November 2020.

Sofia Gil-Clavel, Valeria Bordone and Emilio Zagheni, “Determinants of Online and Offline Close Social Networks Among Older Adults.” Accepted presentation for EPC. Session: Health and Wellbeing in a Digital World. June 2020. Cancelled due to COVID-19.

Sofia Gil-Clavel, Valeria Bordone and Emilio Zagheni, “Determinants of Online and Offline Close Social Networks Among Older Adults.” Accepted presentation for PAA. Flash session: Use of Big Data to Model Health Outcomes and Mortality. April 2020. Cancelled due to COVID-19.

Sofia Gil-Clavel and Emilio Zagheni, “Demographic Differentials in Facebook Usage Around the World”, poster presented at The International AAAI Conference on Web and Social Media (ICWSM-2019). June 2019.

Sofia Gil-Clavel and Emilio Zagheni, “Demographic Differentials in Facebook Usage Around the World”, presented at IUSSP Digital Demography in the Era of Big Data. June 2019.

Sofia Gil-Clavel and Emilio Zagheni, “Demographic Differentials in Facebook Usage Around the World”, poster presented at Population Fest 2019 (PopFest2019). May 2019.

Sofia Gil-Clavel, “Estimation of the infant mortality rate in Mexico in 2015 at municipal level using numerical techniques”, presented at the XIV National Meeting of the Mexican Society of Demography (SOMEDE). June 2018.