

NATO JORJIASHVILI

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Scientific/Research interests: Ground motion prediction models, Seismic hazard assessment, Data science in Earth sciences, Machine Learning and AI in earth sciences

EDUCATION

2004

PHD OF PHYSICS AND MATHEMATICS, IV. JAVAKHISHVILI TBILISI STATE UNIVERSITY, GEORGIA

2005 – 2006

MASTER OF DISASTER MITIGATION, NATIONAL GRADUATE INSTITUTE OF POLICY STUDIES, IISEE, BUILDING RESEARCH INSTITUTE, TOKYO, JAPAN

1998 – 2000

MASTER OF APPLIED MATHEMATICS, IV. JAVAKHISHVILI TBILISI STATE UNIVERSITY, GEORGIA

1993 – 1998

BACHELOR OF APPLIED MATHEMATICS, IV. JAVAKHISHVILI TBILISI STATE UNIVERSITY, GEORGIA

EXPERIENCE

2020 – TO PRESENT

ASSOCIATE PROFESSOR, ILIA STATE UNIVERSITY, INSTITUTE OF EARTH SCIENCES AND NATIONAL SEISMIC MONITORING CENTRE

Scientific research in the field of data science in seismology and geophysics. Main field of research is to build ground motion prediction models based on existing earthquake data, probabilistic seismic hazard and risk assessment, seismic catalogue declustering in space and time; usage of ML and AI in seismology; Giving lectures in different subjects: Mathematical modelling in earth sciences, Probability and Statistics in English, Discrete mathematics in English, Mathematical methods of data processing for earth sciences, Software for earth sciences, etc.

2008 – 2020

ASSISTANT PROFESSOR, ILIA STATE UNIVERSITY, INSTITUTE OF EARTH SCIENCES AND NATIONAL SEISMIC MONITORING CENTRE

2006 – 2013

HEAD OF THE DEPARTMENT OF SEISMIC HAZARD AND RISK ANALYSIS, SEISMIC MONITORING CENTER AT THE FACULTY OF EARTH SCIENCES AND ENGINEERING AT ILIA STATE UNIVERSITY, TBILISI.

2004 – 2006

RESEARCHER, UNITED NATIONAL SURVEY FOR SEISMIC PROTECTION OF GEORGIA, INSTITUTE OF GEOPHYSICS TBILISI. GEORGIA

1999 – 2004

RESEARCHER, IV. JAVAKHISHVILI TBILISI STATE UNIVERSITY

CERTIFICATIONS

- Create Machine Learning Models in Microsoft Azure, Coursera, 2022
- Data Analysis with R Programming, Google, Coursera, 2022
- Introduction to Business Analytics with R, ILLINOIS, Coursera, 2022
- Professional Certification in Data Science (including nine courses: What is data science, Tools for data sciences, Data science methodology, Python for Data Science and AI, Data visualization with Python, Data Analysis with Python, Databases and SQL for data science and python, Machine Learning with python, Python project for data science, Applied data science capstone), Coursera, 2021
- Open Journal of Earthquake Research, Certification on academically important revision, 2020
- Certification of participation in PRIP'2019 (Pattern Recognition and Information Processing (Proceedings of 14th International Conference), Minsk, Belarus, 2019
- Certification of distinguish presentation in 2nd International Conference on Earth Science & Geo Science, Prague, 2019
- Certification of participation in BSM2017 (British Seismology Meeting 2017)
- Certification of participation in GENAH2014, Matsushima, Japan, 2014.
- Certification of Participation in Forum "Knowledge for the future", Sweden, 2013
- Certification of successful compilation of training course for young seismologists in Seismic Hazard, Montpellier, 2010
- Certification of participation in X international Scientific and Practical Conference "Social and Economic Aspects of Education in Modern Society", Poland, 2010
- Certification of Attendance in European Seismological Commission 32nd General Assembly (ESC2010), 2010
- Certification of successful compilation of training course for microtremor, IISEE, BRI, Tsukuba, Japan, 2008

PROJECTS

Ongoing projects			
Project title	Position	Start Year	Donor
Attenuation, earthquake source parameters and scaling relationships in Georgia	Coordinator	2022	Shota Rustaveli National Science Foundation of Georgia
Study of the Moho depth for the territory of Georgia"	Coordinator	2023	Shota Rustaveli National Science Foundation of Georgia

Completed projects				
Project title	Position	Start Year	End Year	Donor
New ground motion prediction equations (GMPE) for the territory of Georgia and their application for seismic hazard assessment	Project Investigator	2020	2023	Shota Rustaveli National Science Foundation of Georgia
Seismic Network Expansion in the Caucasus and Central Asia	Seismologist	2019	2022	STCU
Study of seismic coda attenuation and local magnitude in Georgia	support staff	2016	2021	Shota Rustaveli National Science Foundation of Georgia
Caucasus Seismic Hazard Assessment	Seismologist	2016	2018	Lawrence Livermore National Laboratory and US Government, Department of Energy Nuclear Security Administration
Engineering – seismogeological structure of Georgia, the influence of geological and geophysical parameters on seismic hazard	Head of the project	2015	2018	Shota Rustaveli National Science Foundation of Georgia
Seismic Hazard assessment of the Caucasus	Main Personnel	2013	2016	Shota Rustaveli National Science Foundation of Georgia

CONFERENCES AND MEETINGS

N	Scientific event name	Title of the presentation	Event venue	Year
1	GEOSCIENCE 2023	An updated GMPE models and seismic hazard assessment of Georgia	Bucharest, Romania	2023
2	The Canadian Meteorological and Oceanographic Society (CMOS) 56th Congress, the Canadian Geophysical Union (CGU) Annual Meeting, and the 78th Eastern Snow Conference (ESC) (2022 CMOS-CGU-ESC Joint Congress	Seismic network development and updated ground motion prediction equations for Georgia, Caucasus	Saskatoon, Canada	2022
3	3rd Edition of World Congress on Geology & Earth Science	GMPE models for Georgia, Caucasus Region and dealing with uncertainties	Barcelona, Spain	2022
4	General Assembly of the European Seismological Commission, ESC2021	New GMPE models for Georgia, Caucasus Region	Athens, Greece	2021
5	PRIP'2019. Pattern Recognition and Information Processing (Proceedings of 14th International Conference	Usage of heterogeneous data and other parallel data for prediction problems.	Minsk, Belarus	2019
6	2nd International Conference on Earth Science & Geo Science	Shear wave attenuation models, Local soil conditions and seismic hazard assessment of Tbilisi, Georgia	Prague, Czech Republic	2019
7	12th International Conference on Computer science and information technologies, 2019, CSIT	Usage of heterogeneous data and other parallel data for prediction problems	Yerevan, Armenia	2019
8	EGU2018 European Geosciences Union	Engineering – seismogeological structure of Georgia, the influence of geological and geophysical parameters on seismic hazard	Vienna, Austria	2018
9	BSM 2017 (British Seismology Meeting 2017)	Local soil effects on the Ground Motion Prediction model for the Racha region in Georgia	Reading, UK	2017

10	5th International Colloquium Historical Earthquakes, Paleoseismology, Neotectonics and Seismic Hazard	Engineering – seismogeological structure of Georgia, the influence of geological and geophysical parameters on seismic hazard	Hannover, Germany	2017
11	European Geosciences Union General Assembly 2016 (EGU2016)	Ground Motion Prediction Models for Caucasus Region	Vienna, Austria	2016
12	American Geophysical Union Fall meeting (AGU2016)	Local soil effects on the Ground Motion Prediction model for the Racha region in Georgia	San Francisco, USA	2016
13	ERRA Natural Hazard Modeling	New Ground Motion Prediction Models for Caucasus Region	Minsk, Belarus	2014
14	GENAH 2014	Seismic Hazard analysis of Adjara Region in Georgia	Matsushima, Japan	2014
15	AGU2014 fall meeting	New GMP Models for Caucasus Region	San Francisco, USA	2014
16	AGU 2013	Assessment of uncertainties related to seismic hazard using fuzzy analysis	Cancun, Mexico	2013
17	Knowledge for the Future	New Ground Motion Prediction Models for Caucasus Region	Gothenburg, Sweden	2013
18	EGU General Assembly 2012	Uncertainties related to seismic hazard assessment	Vienna, Austria	2012
19	European Seismological Commission 32nd General Assembly	Recent Earthquake in Racha Region and Statistical analysis	Montpellier, France	2010
20	Journées Luxembourgeoises de Geodynamique (JLG 95)	Attenuation relation and development of seismic hazard of Caucasus region	Echterchan, Luxembourg	2009
21	7-th General Assembly of Asian Seismological Commission (ASC2008)	Seismic Network and Empirical Attenuation Relation of Ground motion of Caucasus Region	Tsukuba, Japan	2008

PUBLICATIONS

1. Jorjiashvili, N., Shengelia, I., Godoladze, T., Gunia, I. and Akubardia, D., Ground-motion prediction equations based on shallow crustal earthquakes in Georgia and the surrounding Caucasus., *Earthq Sci. Vol.35, Issue 6, December 2022, Pages 497-509, Doi: <https://doi.org/10.1016/j.eqs.2022.12.001>.*
2. Shengelia, I., Jorjiashvili, N., Godoladze, T., Gunia, I. and Akubardia, D. (2022). Attenuation of P and S waves in the Javakheti plateau, Georgia (Sakartvelo), *International Journal of Geophysics., Vol. 2022, 2022, Doi: <https://doi.org/10.1155/1970/4436598>.*
3. Natsvlshvili, L., Jorjiashvili, N., Kochoradze, V. (2022). Development of a POSTGIS-based method for creating risk maps of natural disasters using the example of Georgia, *Geodesy and Cartography, 48(2), pp. 70–77. Doi: <https://doi.org/10.3846/gac.2022.14791>.*
4. Intrinsic and Scattering Attenuations in the Crust of the Racha Region, Georgia, 2020, *Journal of Earthquake and Tsunami, 14 (02), 2050006. Doi: <https://doi.org/10.1142/S1793431120500062>.*
5. Phkhovelishvili, M., Jorjiashvili, N., Archvadze, N., Usage of heterogeneous data and other parallel data for prediction problems, 2019, *PRIP'2019. Pattern Recognition and Information Processing (Proceedings of 14thInternational Conference (21-23May, Minsk, Belarus), pp. 178-181.*
6. Shengelia, I., Chelidze, T., Jorjiashvili, N., Godoladze, T., Tumanova, N., Attenuation in the Javakheti Plateau (Georgia) using different Coda methods, 2019, *Bull., of the Goergian Acad. Of Sci., vol.13, pp. 64-68*
7. Chelidze, T., Melikadze, G., Kobzev, G., Shengelia, I., Jorjiashvili, N., Mepharidze, E., Hydrodynamic and seismic response to teleseismic waves of strong remote earthquakes in Caucasus, 2019, *Acta Geophysica, Springer International Publishing, Volume 67, pp. 1–16, DOI <https://doi.org/10.1007/s11600-018-00241-7>.*
8. Matcharashvili, T., Chelidze, T., Javakhishvili, Z., Zhukova, N., Jorjiashvili, N., Shengelia, I., Mepharidze, E., Sborshchikovi, A., Analysis of the Complexity of Seismic Data Sets: Case Study for Caucasus, 2018, *Complexity of Seismic Time Series, pp. 3-24, <https://doi.org/10.1016/B978-0-12-813138-1.00001-8>.*
9. Jorjiashvili, N., Gigiberia, M., Shengelia, I. and Otinashvili, M., Integration of Geophysical and Geotechnical Soil Characteristics for Local Site Seismic Design in Georgia, 2018, *Open Journal of Earthquake Research, 7, 108-123. Doi: [10.4236/ojer.2018.72007](https://doi.org/10.4236/ojer.2018.72007).*
10. Jorjiashvili, N., Elashvili, M., Gigiberia, M., Shengelia, I., Seismic Hazard analysis of Adjara region in Georgia, 2016, *Natural Hazards, Vol.81, issue 2, pp.745-758. Doi: <https://doi.org/10.1007/s11069-016-2167-6>*
11. Chelidze, T., Matcharashvili, T., Javakhishvili, Z., Zhukova, N., Jorjiashvili, N., Shengelia, I., Mepharidze, E., Chelidze, Z., Sborshchikovi, A., Temporal and spatial variations of scaling behavior of seismic process in Caucasus, *Bulletin of Georgian National Academy of Sciences, vol. 9, N 2, 2015, pp. 59-63.*
12. Matcharashvili, T., Chelidze, T., Javakhishvili, Z., Zhukova, N., Jorjiashvili, N. and Shengelia, I., Discrimination between stochastic dynamics patterns of ambient noises (Case study for Oni seismic station), 2013, *Acta Geophys., 61, 6, 1659-1676. Doi: <https://doi.org/10.2478/s11600-013-0141-1>*
13. Matcharashvili, T., Chelidze, T., Javakhishvili, Z., Jorjiashvili, N., Scaling Features of Ambient Noise at Different Levels of Local Seismic Activity: A Case Study for the Oni Seismic Station, 2012, *Acta Geophysica, vol.60, N3, pp. 809-832. Doi: <https://doi.org/10.2478/s11600-012-0006-z>.*
14. Jorjiashvili, N., Yokoi, T., Javakhishvili, Z., Assessment of Uncertainties related to seismic hazard using fuzzy analysis. 2012. *Natural Hazards. Natural Hazards, 60 (2). pp. 501-515. ISSN 0921-030X. Doi: <https://doi.org/10.1007/s11069-011-0026-z>.*

15. Shengelia, I., Javakhishvili, Z., and Jorjiashvili, N., Coda Wave Attenuation for Three Regions of Georgia (Sakartvelo) using Local Earthquakes, *BSSA volume 101-5, October 2011*. Pp. 2220–2230. Doi: <https://doi.org/10.1785/0120100326>.
16. Wyss, M., Trendafiloski, G., Elashvili, M., Jorjiashvili, N. and Javakhishvili, Z., Uncertainties in Teleseismic Earthquake Locations: Implications for Real- Time Loss Estimates, 2010, *BSSA, v. 101; no. 3; pp. 1152-1161*. Doi: <https://doi.org/10.1785/0120100168>.
17. Criado, F., Gachechiladze, G., Jorjiashvili, N., Mandjaparashvili, T., Meladze, H., Tsertsvadze, G., Tsilossani, T., Sirbiladze, G., Fuzzy Analysis (image construction) of the Language Structure on the Finite Set of Insufficient Data. *Journal of Quantitative Linguistics 11(1-2): 93-132 (2010)*. Doi: <https://doi.org/10.1080/09296170512331383675>.
18. Jorjiashvili, N., Elashvili, M., Attenuation Relation and Development of Seismic Hazard of Caucasus Region, 2009, *Ext.Abst. of JLG95*.
19. Javakhishvili, Z., Elashvili, M., Godoladze, T., Jorjiashvili, N., Seismic Hazard Assessment of Caucasus region, 2007, *In the Atlas of GIS based maps of natural disaster hazards for the Sothern Caucasus, editor T.Chelidze, Tbilisi, 6-13*.
20. Jorjiashvili, N., Javakhishvili, Z., Elashvili, M., Seismicity and Rate changes in Caucasus Region. 2007. **Conference commemorating the 50th Anniversary of the 1957 Gobi-Altay Earthquake, Extended Abstract volume. Ulaanbaatar, Mongolia .pp.77-80.**
21. Jorjiashvili, N. Handling Uncertainties in Seismic Hazard Assessment using Fuzzy Analysis. 2007. *Bull.of IISSE. Vol.41, pp.1.*
22. Gachechiladze, J., Gachechiladze, T., Jorjiashvili, N., Amanatashvili, I., Khukhunaishvili, S., Mumladze, T., Algorithm of numerical-tabular data-base compilation for digital seismic records discrimination analysis, **2005, Proc. Tbilisi State Univer. Vol.24, pp. 111-120.**
23. Criado, F., Gachechiladze, T., Jorjiashvili, N., Khvedelidze, Z., Meladze, H., Tsertsvadze, G., and Sirbiladze, G., Theory of Connectivity and Apportionment of Representative Activity Chains in the Problem of Decision-Making Concerning Earthquake Possibility. *Int. J. of General Systems. vol. 32, #2, pp.103-121, (2003)*. Doi: <https://doi.org/10.1080/0308107031000088083>.
24. Criado, F., Gachechiladze, T., Jorjiashvili, N., Mandjaparashvili, T., Meladze, H., Tsertsvadze, G., Tsilossani, T., and Sirbiladze, G., Fuzzy Aanalysis (image construction) of the Language Structure on the Finite Set of Insufficient Data. *Monograph at Piotrovsky 80th anniversary. Sankt-Peterburg. 2002.*
25. Jorjiashvili, N., New General Characteristics of Word Syllabic Fuzzy Organization in Georgian Language. *Bull.of Geor. Acad. of Sci., 165. #3, 2002.*
26. Jorjiashvili, N., The Certain Distribution of Planets on Heavenly Sphere at the moment of the Earthquake as a Triggering Effect (Combined Model). *Bull.of Geor. Acad.of Sci., 166, #1, 2002.*
27. Giorgadze, D., Jorjiashvili, N., Statistical – Possibilistic Model of Word Formation Process in Spanish Language. *Proc.of Jav. TSU App. Math. and Inf. Sci., Vol. 340 (21), (2001). pp.29-32*
28. Criado, F., Gachechiladze, T., Jorjiashvili, N., Khvedelidze, Z., Meladze, H., Sirbiladze, G., Tsertsvadze, G., Theory of Connectivity and Apportionment of Representative Activity Chains in the Problem of Decision-making Concerning Earthquake Possibility. *App. Math. and Inf. – Tbilisi – 2001 –v.6, №.2 – pp.65-75.*
29. Jorjiashvili, N., Sirbiladze, G., Probabilistic-Possibilistic Analysis of Insufficient Expert Data. *Proc.of Jav. TSU App. Math. and Inf. Sci., Vol. 331 (20), No.1 (2001)*. Research funded by INTAS no 2126 (A).

SCIENTIFIC PRODUCTIVITY

Google scholar: Citations: 155 H index: 7

Scopus: Citations: 92 H index: 5

KNOWLEDGE OF LANGUAGES

Georgian – native

English – fluent C1 (certificate)

Russian – fluent

Japanese – basic

ADDITIONAL INFORMATION

- President's Scholarship, (2004-2007)
- Scholarship of International Lithosphere Program (ILP), 2007
- Berkner Scholarship, 2013.
- Worked on about 40 non-scientific projects with private companies in the field of both geophysics and data science.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

EGU – European Geophysical Union

EAGE – European Association Geoscientists and Engineers

AGU – American Geophysical Union

HOBBIES

Music (creating compositions), singing, charity.