



PERSONAL INFORMATION

Gessica UMILI



 Dipartimento di Scienze della Terra
 Università degli Studi di Torino
 Via Valperga Caluso, 35 10125 Torino (Italia)
 +39 011 - 0918364

 gessica.umili@unito.it

 <https://scholar.google.com/citations?user=Myf5wF8AAAAJ&hl=it>

ORCID ID orcid.org/0000-0002-2448-6020

Date of birth 07/02/1983 | **Nationality** Italian

Current Position Associate Professor at University of Turin (UNITO)

RESEARCH INTERESTS

Summary

Theoretical and experimental studies on rock mechanics: traditional and non-contact (by photogrammetric or laser-scanning technics) geo-structural survey methods; automatic discontinuity traces sampling on rock mass 3D models; quantitative assessment of discontinuity roughness based on 3D models; application of Digital Image Correlation (DIC) analysis method to the study of failure initiation in rocks.

Slope stability analysis: theoretical and experimental studies of rockfall; rockfall hazard assessment, with particular focus on block volume distributions; numerical analysis (with continuous and discontinuous approaches) to study stability conditions of natural slopes and quarries.

Development of design strategies for rockfall and debris flow flexible barriers; application of the reliability-based design (RBD) approach to barriers design.

Development of a semi-automatic method for detecting geological lineaments on Digital Terrain Models (DTM); multiscale approach for correlating the structural asset, local rock mass structure and underground stress state.

Bibliometric Indicators

SCOPUS: h-index 11, citations 409, documents 53
 Google Scholar: h-index 13, citations 506, i10-index 16

WORK EXPERIENCE

From 2022 - Current

Associate Professor

Dept. of Earth Sciences, Università degli Studi di Torino – Torino, Italy

- Rock and soil mechanics
- Slope stability
- Geotechnical works

From 2019 to 2021

Senior Researcher (RTDb)

Dept. of Earth Sciences, Università degli Studi di Torino – Torino, Italy

2018

Junior Researcher (RTDa)

DIATI, Politecnico di Torino – Torino, Italy

From 2014 to 2018

Postdoctoral fellow

Dept. of Earth Sciences, Università degli Studi di Torino – Torino, Italy

From 2012 to 2014

Postdoctoral fellow

Dept. of Civil and Environmental Engineering and Architecture, Università degli Studi di Parma – Parma, Italy

EDUCATION

- 2012 **PhD in Civil Engineering**
Università degli Studi di Parma
- 2008 **MSc in Environmental Engineering**
Università degli Studi di Parma
- 2006 **BSc in Environmental Engineering**
Università degli Studi di Parma

PERSONAL SKILLS

Mother tongue(s) Italian

Other language(s)

	UNDERSTANDING		SPOKEN		WRITING
	Listening	Reading	Interaction	Production	
English	B2	C1	B2	B2	C1

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user
Common European Framework of Reference for Languages

JOB-RELATED SKILLS

- laboratory and field investigation; photogrammetry and LIDAR surveys; LEM/FEM/DEM numerical modelling
- code programming in Matlab language

NATIONAL AND INTERNATIONAL GRANTS (as principal investigator)

- 2022-2023 MITRISK - Nuovi approcci per la mitigazione del rischio da caduta massi e debris flow: dall'identificazione dei segnali precursori ai sistemi di protezione - Bando "Grant for Internationalization" 2022, Università degli Studi di Torino
- 2017-2019 Semi-Automatic DEM-based approach to detect geological Lineaments for natural hazards MONitoring, structural study and hydrogeological researches (SALMON), German Aerospace Centre (DLR), scientific use of the TerraSAR-X / TanDEM-X data

TEACHING ACTIVITY

- 2018-Current Slope stability, Geotechnics, Geotechnical works.
Introduction to programming in Matlab (for PhD students)
- 2021-Current Laboratory of rock mechanics and tunnels

FURTHER INFORMATION

National and international acknowledgments Winner of the Award for Young Authors, for the best research paper, assigned by SIFET (Italian Society of Photogrammetry and Topography) in 2013.

Prototypes: mathematical tools CurvaTool: a tool for semi-automatic extraction of linear features from DTM and DSM.
AMTT: a tool for performing automatic kinematic analysis on DEM of rock masses

- Memberships**
- AGI (Associazione Geotecnica Italiana)
 - ISRM (International Society for Rock Mechanics)
 - SIGEA (Società Italiana di Geologia Ambientale)

Evaluation of research results

- Reviewer for the following journals: Computers & Geosciences, International Journal of Rock Mechanics and Mining Sciences, Rock Mechanics and Rock Engineering, Arabian Journal of Geosciences, Bulletin of Engineering Geology and the Environment, Geotechnique Letters, Sustainability, Applied Sciences, Geosciences, Remote Sensing


ATTACHMENT

- List of the top publications in the main research field (in the last ten years)

Personal data According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV

Date: Torino, September 7, 2023

Signature: Gessica Umili



List of the top publications in the main research field (in the last ten years)

1. Umili, G., Taboni, B., Ferrero, A.M. (2023). Influence of uncertainties: A focus on block volume and shape assessment for rockfall analysis. *Journal of Rock Mechanics and Geotechnical Engineering*, 15 (9), pp. 2250-2263. doi: 10.1016/j.jrmge.2023.03.016
2. Taboni, B., Tagliaferri, I.D., Umili, G. (2022). A Tool for Performing Automatic Kinematic Analysis on Rock Outcrops. *Geosciences*, 12, 435. doi: 10.3390/geosciences12120435
3. Bonasera M., Fubelli G., Comina C., Bosco F., Umili G., Zorloni L., Porcarelli F. (2022). A multidisciplinary approach to detect the seismogenic source of the Tortona 1828 earthquake (Piedmont, Northwest Italy). *Italian Journal of Geosciences*, 141 f.1, pp. 69-83. doi: 10.3301/IJG.2022.07
4. Taboni, B.; Licata, M.; Buleo Tebar, V.; Bonasera, M.; Umili, G. (2022). Proposal for Flood Risk Mitigation in the Upper Tanaro Valley (Western Alps—North-Western Italy). *Geosciences*, 12, 260. doi: 10.3390/geosciences12070260
5. Bonetto S.M.R., Vagnon F., Umili G., Vianello D., Migliazza M.R., Ferrero A.M. (2021). The contribution of remotely sensed data to the stress state evaluation in underground marble quarries. *Egyptian Journal of Remote Sensing and Space Science*, 24 (1), pp. 1-13. doi: 10.1016/j.ejrs.2020.12.008
6. Carriero, M. T., Ferrero, A. M., Migliazza, M. R., & Umili, G. (2021). Comparison between methods for calculating the volume of rock blocks. In *IOP Conference Series: Earth and Environmental Science*, Vol. 833, No. 1, p. 012049. IOP Publishing. doi:10.1088/1755-1315/833/1/012049
7. Umili, G. (2021). Methods for sampling discontinuity traces on rock mass 3D models: state of the art. In *IOP Conference Series: Earth and Environmental Science*, Vol. 833, No. 1, p. 012050. IOP Publishing. doi:10.1088/1755-1315/833/1/012050
8. Vagnon F., Dino G.A., Umili G., Cardu M., Ferrero A.M. (2020). New developments for the sustainable exploitation of ornamental stone in carrara basin. *Sustainability*, 12(22), pp. 1–23, 9374. doi: 10.3390/su12229374
9. Vagnon F., Bonetto S., Ferrero A.M., Harrison J.P., Umili G. (2020). Eurocode 7 and Rock Engineering Design: The Case of Rockfall Protection Barriers. *Geosciences* 10(8), 305. doi: 10.3390/geosciences10080305
10. Zeighami Moghaddam M., Umili G., Messina V., Bonetto S., Ferrero A.M., Bollini G., Gandreau D. (2020). An SVM-Based Scheme for Automatic Identification of Architectural Line Features and Cracks. *Applied Sciences* 10(15), 5077. doi: 10.3390/app10155077
11. Umili G., Bonetto S., Mosca P., Vagnon F., Ferrero A.M. (2020). In Situ Block Size Distribution Aimed at the Choice of the Design Block for Rockfall Barriers Design: A Case Study along Gardesana Road. *Geosciences* 10(6), 223. doi: 10.3390/geosciences10060223
12. Bonetto S., Umili G., Ferrero A.M., Carosi R., Simonetti M., Biasi A., Migliazza M.R., Bianchini S. (2020). Geomechanical Study of the Piastrone Quarry (Seravezza, Italy) Supported by Photogrammetry to Assess Failure Mode. *Geosciences*. 10(2), 64. doi: 10.3390/geosciences10020064
13. Bonetto S., Facello A., Umili G. (2020). The contribution of CurvaTool semi-automatic approach in structural and groundwater investigations. A case study in the Main Ethiopian Rift Valley. *Egyptian Journal of Remote Sensing and Space Sciences*. 23(1): 97-111. doi: 10.1016/j.ejrs.2018.10.003

14. Ferrero A.M., Migliazza M.R., Umili G. (2019). Comparison of methods for discontinuity roughness evaluation. *Rivista Italiana di Geotecnica*. 3: 5-15. doi: 10.19199/2019.3.0557-1405.005
15. Costantini G., Comina C., Ferrero A.M., Umili G., Bonetto S. (2019). Applicazione in sotterraneo di tecniche fotografiche e GPR per il rilievo di discontinuità. *Rivista Italiana di Geotecnica*. 2: 37-47. doi: 10.19199/2019.2.0557-1405.037
16. Caselle C., Umili G., Bonetto S., Ferrero A.M. (2019). Application of DIC analysis method to the study of failure initiation in gypsum rocks. *Geotechnique Letters* 9(1): 35-45. doi: 10.1680/jgele.18.00156
17. Umili G., Bonetto S., Ferrero A.M. (2018). An integrated multiscale approach for characterization of rock masses subjected to tunnel excavation. *Journal of Rock Mechanics and Geotechnical Engineering*. 10(3): 513-522. doi: 10.1016/j.jrmge.2018.01.007
18. Vagnon F., Harrison J.P., Ferrero A.M., Umili G. (2018). Reliability based design for rock fall barriers. *Proceedings of EUROCK2018 - Geomechanics and Geodynamics of Rock Masses*, vol. 2, p. 1543-1548. London: Taylor and Francis Group, ISBN: 978-1138-6164-5-5. 22-27 May, Saint Petersburg, Russia.
19. Vagnon F., Ferrero A.M., Umili G., Segalini A. (2017). A Factor Strength Approach for the Design of Rock Fall and Debris Flow Barriers. *Geotechnical and Geological Engineering* 35(6): 2663-2675. doi: 10.1007/s10706-017-0269-x
20. Bonetto S., Facello A., Umili G. (2017). A new application of CurvaTool semi-automatic approach to qualitatively detect geological lineaments. *Environmental and Engineering Geoscience* 23(3): 179-190. doi: 10.2113/EEG-1863
21. Ferrero A.M., Migliazza M.R., Pirulli M., Umili G. (2016). Some open issues on rock fall hazard analysis in fractured rock mass: problems and prospects. *Rock Mechanics and Rock Engineering* 49 (9): 3615-3629. doi: 10.1007/s00603-016-1004-2
22. Colombero C., Comina C., Umili G., Vinciguerra S. (2016). Multiscale geophysical characterization of an unstable rock mass. *Tectonophysics* 675: 275-289. doi: 10.1016/j.tecto.2016.02.045
23. Racaniello A., Bonetto S., Enrici Baion R., Ferrero A.M., Umili G. (2015). Caratterizzazione di ammassi rocciosi in sotterraneo mediante rilievo geostrutturale "non a contatto". *Geoingegneria Ambientale e Mineraria*, Anno LII, n. 2: 51-58 (in Italian).
24. Armillotta P., Pastarini B., Segalini A., Umili G. (2015). Application of Low Potential Electric Fields for Improving Slope Stability. *Procedia Earth and Planetary Science* 15: 173-180, doi: 10.1016/j.proeps.2015.08.042
25. Ferrero A.M., Segalini A., Umili G. (2015). Experimental tests for the application of an analytical model for flexible debris flow barriers design. *Engineering Geology*, vol. 185, p. 33-42. doi: 10.1016/j.enggeo.2014.12.002
26. Bonetto S., Facello A., Ferrero A.M., Umili G. (2015). A Tool for Semi-Automatic Linear Feature Detection Based on DTM. *Computers & Geosciences*, vol. 75, p. 1-12. doi: 10.1016/j.cageo.2014.10.005
27. Curtaz M., Ferrero A.M., Roncella R., Segalini A., Umili G. (2014). Terrestrial photogrammetry and numerical modelling for the stability analysis of rock slopes in high mountain areas: Aiguilles Marbrées case. *Rock Mechanics and Rock Engineering* 47 (2): 605 – 620. doi: 10.1007/s00603-013-0446-z
28. Umili G. (2013). Ricostruzione automatica delle linee di rottura nei Modelli Digitali di Superficie con applicazioni in ambito Geotecnico, Geomorfologico e Architettonico. *Bollettino della Società Italiana di Fotogrammetria e Topografia*, vol. 2, pp. 91-113. ISSN: 1721-971X
29. Umili G., Ferrero A.M., Einstein H.H. (2013). A new method for automatic discontinuity traces sampling on rock mass 3D model. *Computers & Geosciences* 51 (2013): 182–192. doi: 10.1016/j.cageo.2012.07.026