Mathieu **Le Breton**

Birthday 24/04/1985 | Citizenship French

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Research objective

I have a non-linear career, and currently work in a geophysical services company as R&D engineer. I am doing my research mostly on my free time, and want to dedicate to it fully. I am developing non-destructive sensing methods, with a focus on backscattering communication wave propagation. I see passive wireless sensors as a low-footprint alternative for sensing and understanding our environment.

Education

2019	**PhD, Geophysics**, ISTerre, Grenoble University, France
2015	**Master, Applied Geophysics,** Sorbonne University, France
2008	**Master, Innovation Management,** IAE, Toulouse School of Management, France
2008	**Master Ingénieur, Applied Physics,** INSA, Toulouse University, France

Employment

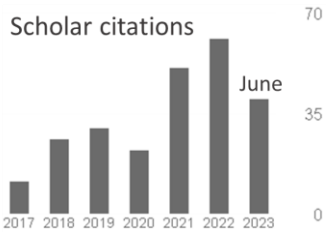
2019-to date	**Applied scientist,** Géolithe Innov Company, France
2016-2019	**PhD Candidate,** Geophysics, Géolithe/ISTerre, France
2015-2016	**Research engineer**, Geophysics, Géolithe/CNRS, France
2015-2015	**Research assistant**, Geophysics, Colorado school of Mines, USA
2012-2013	**Musician,** Accordion, Peru, Brazil
2008-2011	**Marketing Manager**, Petals Link, France
2007-2007	**Research Trainee**, Physics Lab, Oxford University, UK

Teaching and supervision

2021-2024	**PhD thesis**, Arthur Charléty, Université Grenoble Alpes
2021	**Signal processing for geophysics (7h)**, Université Grenoble Alpes
2022	**MSc trainee,** Romain Ponchut, Snow humidity sensing
2021	**MSc trainee,** Marco Lecci, millimetric displacement sensing with RFID
2018	**MSc trainee**, Axel Pionchon, software development for instrumentation
2018	**MSc trainee**, Guilhem Scheiblin, 3D localization of RFID tag
2017	**MSc trainee**, Arthur Hamburger, characterization of tag read range

Publications

Publication count	
10	Peer-reviewed academic journals
1 subm.	Books and book chapters
2 (+3 subm.)	Conference publications
1	Patent
H-index	7 (Google Scholar), 6 (Web of Science)



Projects, Grants and Fellowships

Total approved research funding: 278,000 €

09.2022-09-2023	TAGLOR. 100k€ funded by region AURA. I initiated the proposal and participated in the project supervision, with CEA-Leti as partner.
01.2020-06.2024	RISQID. 169k€ funded by region AURA. I initiated and wrote the proposal. I co-supervised the funded PhD student.
04.2019-06.2022	RFID3D. 9k€ funded by INSU-CNRS. Grenoble.

Memberships

IEEE-MTTS-TC26	Member of Microwave Theory and Techniques Society, Technical Comitee 26
EGU	Regular member

Awards

2020	Jean Goguel Award, French Comitee of Engineering Geology (CFGI)
2018	Best poster award, Rock-Slope Stability Symposium
2018	Outstanding Student Poster Award, European Geoscience Union (EGU)

Additional training

2021	Stress management in teamworking, Lemardeley C. (30h)
2018	English Scientific Writing, Sinclair S. (30h)
2018	Data Science for Geosciences, Chatelain F (30h)
2017	Data assimilation, Cosme E (30h)
2016	Data processing, Pedersen H., Moreau L (30h)
2016	Antennas and propagation, Benech P. (30h)
2015	Geophysics Field Camp, EAGE (30h). Germany.

Interests

Since 2022	Sound engineer for live music shows. Half-professional.
Since 2012	Musician, playing Argentinian Tango and Brazilian Forró. Half-professional.
Since long	Running and rock-climbing.

Skills and languages

Programming	Practice of collaborative development. Basis of clean code, architecture, git.
Expertise	Radiofrequency localization, Ambient noise seismology, sensor developments, signal processing, landslide monitoring.
Languages	French (native), English (fluent), Spanish (fluent), Portuguese (fluent)

A full list of publications

Peer-reviewed journal publications

1. Le Breton M., Larose É., Baillet L., Lejeune Y., van Herwijnen A., 2023.
   Snow water equivalent can be monitored using RFID signal propagation.
   The Cryosphere. https://doi.org/10.5194/egusphere-2022-761
2. Charléty A., Le Breton M., Baillet L., Larose É., 2023.
   RFID landslide monitoring: long-term outdoor signal processing and phase unwrapping.
   IEEE Journal of Radio Frequency Identification. https://doi.org/10.1109/JRFID.2023.3256560
3. Le Breton M., Liébault F., Baillet L., Charléty A., Larose É., Tedjini S., 2022.
   Dense and long-term monitoring of earth surface processes with passive RFID—a review.
   Earth-Science Reviews, 104225. https://doi.org/10.1016/j.earscirev.2022.104225
4. Charléty A., Le Breton M., Larose É., Baillet L., 2022.
   2D Phase-Based RFID Localization for On-Site Landslide Monitoring.
   Remote Sensing. https://doi.org/10.3390/rs14153577
5. Le Breton M., Bontemps N., Guillemot A., Baillet L., Larose É., 2021.
   Landslide monitoring using seismic ambient noise correlation: challenges and applications.
   Earth-Science Reviews. https://doi.org/10.1016/j.earscirev.2021.103518
6. Le Breton M., Baillet L., Larose É., Rey E., Benech P., Jongmans D., Guyoton F., Jaboyedoff M., 2019.
   Passive radio-frequency identification ranging, a dense and weather-robust technique for landslide displacement monitoring. Engineering Geology. https://doi.org/10.1016/j.enggeo.2018.12.027
7. Le Breton M., Baillet L., Larose É., Rey E., Benech P., Jongmans D., Guyoton F., 2017.
   Outdoor UHF RFID: Phase Stabilization for Real-World Applications.
   IEEE Journal of Radio Frequency Identification. http://doi.org/10.1109/JRFID.2017.2786745
8. Revil A., Murugesu M., Prasad M., Le Breton M., 2017.
   Alteration of volcanic rocks: A new non-intrusive indicator based on induced polarization measurements.
   Journal of Volcanology and Geothermal Research. https://doi.org/10.1016/j.jvolgeores.2017.06.016
9. Revil A., Le Breton M., Niu Q., Wallin E., Haskins E., Thomas D. M., 2017.
   Induced polarization of volcanic rocks. 2. Influence of pore size and permeability.
   Geophys J Int. https://doi.org/10.1093/gji/ggw382
10. Revil A., Le Breton M., Niu Q., Wallin E., Haskins E., Thomas D. M., 2017.
    Induced polarization of volcanic rocks–1. Surface versus quadrature conductivity.
    Geophys J Int 208, 826–844. https://doi.org/10.1093/gji/ggw444

Book chapters

*Le Breton M., Bhattacharrya R, Cassel M. Chapter "**Challenges of using RFID for outdoor environmental monitoring**" in the book "Wireless indentification and sensing systems for harsh and severe environments" edited by S. Tedjini and V. Palazzi. Accepted in Wiley-IEEE Press.*

Conference publications

- *Le Breton M., Baillet L., Larose É., Accepted, 2023.*
  ***Tomography of grass bulk permittivity using RFID propagation-based sensing**.*
  IEEE Int. Conf. on RFID-TA. Acce https://doi.org/10.36227/techrxiv.23538381
- *Le Breton M., Grunbaum N. Accepted, 2023.*
  ***Partial phase ambiguity solving on dual band, to improve RFID tag localization**.*
  IEEE Int. Conf. on RFID-TA. https://doi.org/10.36227/techrxiv.23538405
- *Charléty A., Michel O., Le Breton M. Accepted, 2023.*
  ***Kalman Smoothing for better RFID Landslide Monitoring**,*
  European Signal Processing Conference (ESIPCO).

1. Charléty A., Le Breton M., Baillet L., Larose E., 2022.
   Long-term Monitoring of Soil Surface Deformation with RFID,
   2022 IEEE Int. Conf. on RFID-TA. https://doi.org/10.1109/RFID-TA54958.2022.9924156

2. Le Breton M., Baillet L., Larose E., Rey E., Benech P., Jongmans D., Guyoton F., 2017. **Outdoor meteorological effects on UHF RFID phase shift: Experimental simulations,** IEEE Int. Conf. on RFID, Phoenix, AZ, USA. https://doi.org/10.1109/RFID.2017.7945594

Patents

1. Baillet L., Le Breton M., Jongmans D., Larose E., Rey E., Guyoton F., 2018. Procédé, système et programme d'estimation du déplacement d'une structure géologique et/ou de génie civil susceptible de se déplacer. WO2018197824A1. https://data.inpi.fr/brevets/WO2018197824

A full list of presentations

Invited oral presentations

1. Seminary at CEN (Center for Snow Study), Météo France, Grenoble, 2022.
2. URSI General Assembly, Rome, Italy, 2021.
3. Journées Nationales de la Géologie et Géotechnique, online, 2020.
4. Jean-Goguel Award public competition, French Comitee of Engineering Geology (CFGI), online, 2020. Suivi de Terrains Instables à l'aide d'un réseau dense de capteurs RFID : émergence de nouvelles applications—received the Jean-Goguel Award.

Conference presentations

1. Workshop on landslides activated by water, Besançon France, 2023.
2. European Geoscience Union (EGU) General Assembly, Vienna, Austria, 2023. SAR localization of RFID tags across vegetation and snow.
3. European Geoscience Union (EGU) General Assembly, Vienna, Austria, 2022. Estimation of snow SWE and temperature using passive RFID tags as radar reflectors. Convener's highlight.
4. Rencontres Permafrost, Société Hydrologique de France, Online, 2022.
5. European Geoscience Union (EGU) General assembly, Vienna, Austria, 2021. Monitoring rock displacement threshold with 1-bit sensing passive RFID tag
6. EGU General Assembly, online, 2020. Passive RFID, a new technology for dense and long-term monitoring of unstable structures: review and prospective.
7. EGU General Assembly, online, 2020. Ambient seismic noise monitoring: an online application for decision makers.
8. Rock Slope Stability Symposium, Chambéry, France, 2018.
9. Wegener General Assembly, Grenoble, France, 2018.
10. Journées Nationales de la Géologie et Géotechnique, Champs-sur-Marne, France, 2018.
11. Journée Vulnérabilité des Ouvrages aux Risques, Grenoble, France, 2018.
12. CNRS GDR Ondes, RFID Day, Valence, 2018.
13. IEEE International conference on RFID, Phoenix, USA, 2017.

Poster presentations

1. Assise Nationale des Risques Naturels, Strasbourg, France, 2023. Titre
2. Journées Aléas Gravitaires, Montpellier, France, 2022.
3. URSI-France scientific days–pitch competition for Radiofrequency PhD award, Palaiseau, France, 2020.
4. Rock Slope Stability Symposium, Chambéry, France, 2018—Received the best poster award.
5. Journées Nationales de la Géologie et Géotechnique, Champs-sur-Marne, France, 2018.
6. European Geoscience Union (EGU) General assembly, Vienna, Austria, 2018—Received the Outstanding Student Poster Award.
7. CNRS GDR Ondes General Assembly, Sophia-Antipolis, France, 2017.