Anh Phuong Tran, Ph.D.

Lawrence Berkeley National Laboratory
1 Cyclotron Road
Berkeley, California, 94720 USA

Office: (510) 486 5971
Mobile: (510) 701 5698
E-mail: aptran@lbl.gov
https://sites.google.com/a/lbl.gov/phuongtran

Career Objective

I am looking for a tenure-track faculty position in the environmental geophysics of a leading university, or a research position at a top research laboratory.

Education

- **Ph.D.** **Université catholique de Louvain, Belgium, 2014**

  Supervisor: Prof. Sébastien Lambot

  Dissertation: *Full-wave inversion of near-field GPR data for hydrogeophysical characterization of soil*

- **M.Eng.** **Sejong University, South Korea, 2010**

  Supervisor: Prof. Bae Deg Hyo

  Thesis: *Coupling of Hydrological, Hydraulic models and Weather Radar data for Flood and Inundation Prediction*

  Ranked first among all of the graduate students in civil & environmental engineering (GPA: 4.44/4.5)

- **B.Sc.** **Vietnam National University-Hanoi, Vietnam, 2005**

  Supervisor: Huu Khai Nguyen

  Thesis: *Application of GIS, Hydrological and Hydraulic model for Flood Forecast in Huong River Basin*

  Ranked first among all of the students in the field of hydrology, meteorology and oceanography (GPA: 8.34/10)

Research experiences

- **2014 – present: Postdoctoral Fellow, Earth Sciences Division, Lawrence Berkeley National Laboratory, United States**
  - Develop a joint hydrological-thermal-geophysical inversion to estimate soil hydrological and thermal parameters from capillary pressure, temperature and electrical resistivity data
  - Investigate the surface-subsurface hydrological and thermal dynamics in the arctic tundra by monitoring and inverse modeling of above- and below-ground measurements
  - Explore the controls of snow depth, leaf area index (LAI), organic carbon and mineral

contents on the variability of thaw depth in the permafrost region

- Develop a Matlab-based graphical user interface (GUI) for pre- and post-processing nonisothermal hydrological model

- **2010 – 2014: Research Assistant, Environmental Science – Earth and Life Science Institute, Université catholique de Louvain, Belgium**
  - Develop a coupled hydrological-geophysical data assimilation framework to estimate soil hydrological parameters and to update subsurface soil moisture profile prediction from ground-penetrating radar data
  - Apply data fusion technique to combine ground-penetrating radar and frequency domain reflectometry for high-resolution space-time quantification of soil moisture variability along a hillslope.
  - Develop a full-wave near-field antenna model for reconstruction of soil layers
  - Integrate soil dielectric mixing model into full-wave antenna inversion to directly estimate soil moisture from ground-penetrating radar data

- **2008 – 2010: Research Assistant, Waterway Research Institute, Sejong University, South Korea**
  - Develop algorithm to pre-process weather radar data and estimate rainfall
  - Couple hydrological, hydraulic models and weather radar data for flood prediction in urban area.

- **2005 – 2008: Hydrological Researcher, Center for Hydrology & Water Resources, Vietnam Institute of Hydrology, meteorology and Environment**
  - Establish a procedure to calibrate and validate rainfall-runoff models using event stream flow data
  - Combine hydrological model and ArcGIS to construct flood inundation map in Huong river basin
  - Determination of rainfall threshold serving for flashflood warning system
  - Development of GUI hydro-meteorological and geographical database based on Visual.NET and MapObjects

Research interests

- Surface and subsurface hydrological and biochemical modeling
- Permafrost geophysics
- Data assimilation in geosciences
- Geophysical and remote sensing techniques
- Deterministic and stochastic inverse modeling and uncertainty analysis
- Geostatistics and Bayesian data fusion

Fellowship and awards

- Odon Vallet, Rencontres du Vietnam award, 2002
- University annual scholarship for excellent students, Vietnam National University, Hanoi, 2001 - 2005
- First-ranked student award in Hydrology, Vietnam National University, Hanoi, 2005
- Toshiba scholarship for outstanding graduate students, Toshiba Corporation, 2007
- Research assistant scholarship, Sejong University, 2008 - 2010
- PhD fellowship, Université catholique de Louvain, 2010 - 2014
- Postdoctoral fellowship, Lawrence Berkeley National Laboratory, 2014 - present

Professional Services

- Member of European Geoscience Union (EGU) and American Geoscience Union (AGU)
- Reviewer of Water Resources Research, Advances in Water Resources, Geophysics, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, IEEE Transactions on Geoscience and Remote Sensing, Sensors, Waters, Journal of applied Geophysics, Radio Science
- Co-guest editor of the special issue titled "*New Techniques on Remote Sensing Soil Characterization*" of the Applied and Environmental Soil Science journal
- Scientific Review Panel of the 15th International Conference on Ground Penetrating Radar, GPR 2014

Computer skills

- Fluent in programming languages: Matlab, Fortran, Python, C++, Visual Basic
- Fluent in Parallel computing libraries: OpenMPI, MPICH, pMatlab
- Operation systems: Windows, Linux, Unix
- Experience of office software: Open Office, Microsoft Office

Publication

Peered review journal articles

1. **Tran, Anh Phuong**, Dafflon, Baptiste, Kowalsky, Michael B., Long, Philip, Tokunaga, Tetsu K., Williams, Kenneth H., and Hubbard, S. Susan (2016): Quantifying Shallow Subsurface Water and Heat Dynamics using Coupled Hydrological-Thermal-Geophysical Inversion, *Hydrology and Earth System Sciences,* 20, 3477-3491, 2016. doi:10.5194/hess-20-3477-2016.
2. De Coster, Albéric, **Tran, Anh Phuong**, Lambot, Sébastien (2016). Fundamental Analyses on Layered Media Reconstruction Using GPR and Full-Wave Inversion in Near-Field Conditions. *IEEE Transactions on Geoscience and Remote Sensing,* 99, 1-16. doi: 10.1109/TGRS.2016.2556862
3. **Tran, Anh Phuong**, Dafflon, Baptiste, & Hubbard, Susan (2016). iMatTOUGH: An open-source Matlab-base Graphical User Interface for Pre- and Post-processing of TOUGH2 and iTOUGH2 Model. *Computers & Geosciences, 89,* 132-143. doi:10.1016/j.cageo.2016.02.006

4. **Tran, Anh Phuong**, Bogaert, Patrick, Wiaux, Francois, Vanclooster, Marnik, & Lambot, Sébastien (2015). High-resolution space-time quantification of soilmoisture along a hillslope using joint analysis of ground penetrating radar and frequency domain reflectometry data. *Journal of Hydrology*, 523, 252-261. doi:10.1016/j.jhydrol.2015.01.065

5. **Tran, Anh Phuong**, Vanclooster, Marnik, Zupanski, Milija, & Lambot, Sébastien (2014). Joint estimation of soil moisture profile and hydraulic parameters by ground-penetrating radar data assimilation with maximum likelihood ensemble filter. *Water Resources Research*, 50(4), 3131-3146. doi :10.1002/2013WR014583

6. **Tran, Anh Phuong**, André, Frédéric, & Lambot, Sébastien (2014). Validation of Near-Field Ground- Penetrating Radar Modeling Using Full-Wave Inversion for Soil Moisture Estimation. *IEEE Transactions on Geoscience and Remote Sensing*, 52, 5483-5497. doi :10.1109/TGRS.2013.2289952

7. **Tran, Anh Phuong**, Vanclooster, Marnik, & Lambot, Sébastien (2013). Improving soil moisture profile reconstruction from ground-penetrating radar data: a maximum likelihood ensemble filter approach. *Hydrology and Earth System Sciences*, 17, 2543-2556. doi :10.5194/hess-17-2543-2013

8. **Tran, Anh Phuong**, André, Frédéric, Craeye, Christophe, & Lambot, Sébastien (2013). Near-field or far- field full-wave ground penetrating radar modeling as a function of the antenna height above a planar layered medium. *Progress in Electromagnetics Research B*, 141, 415-430.

9. **Tran, Anh Phuong**, Warren, C., André, Frédéric, Giannopoulos, Athanasios, & Lambot, Sébastien (2013). Numerical evaluation of a full-wave antenna model for near-field applications. *Near Surface Geophysics*, 11(2), 155-165. doi :10.3997/1873-0604.2012052

10. **Tran, Anh Phuong**, Mahmoudzadeh Ardekani, Mohammad Reza, & Lambot, Sébastien (2012). Coupling of dielectric mixing models with full-wave ground-penetrating radar signal inversion for sandy-soil-moisture estimation. *Geophysics*, 77, 33-44. doi :10.1190/GEO2011-0100.1

11. Yoon, Seong-Sim, **Tran, Anh Phuong**, & Bae, Deg-Hyo (2012). Quantitative Comparison of the Spatial Distribution of Radar and Gauge Rainfall Data. *Journal of Hydrometeorology*, 13, 1939–1953. doi: http://dx.doi.org/10.1175/JHM-D-11-066.1

12. Nguyen, Tien Giang & **Tran, Anh Phuong** (2010). Calibration and verification of a hydrological model using event data. *Journal of Science, Earth Sciences*, 26, 64-74.

13. Bae, Deg-Hyo, **Tran, Anh Phuong**, & Yoon, Seong-Sim (2009). A Method to Evaluate the Radar Rainfall Accuracy for Hydrological Application. *Journal of Korea Water Resources Association*, 42(12), 1039-1052. doi: 10.3741/JKWRA.2009.42.12.1039

14. Nguyen, Tien Giang, Joric, Chea & **Tran, Anh Phuong** (2009). A method to construct flood damage map with an application to Huong River basin, in Central Vietnam. *VNU Journal of Science, Earth Sciences,* 25(1), 10-19.

15. Nguyen, Tien Giang, Tran, Ngoc Anh, Nguyen, Thanh Sơn, **Tran, Anh Phuong**, Ngo, Chi Tuan , Nguyen, Duc Hanh (**2009)**. Assessment and Prediction of Water Pollution Induced by Aquaculture Activities at the Seashore in Quang Tri, 25(1S), 35-45. (In Vietnamese)

16. Nguyen, Tien Giang, **Tran, Anh Phuong**, Tran, Ngoc Anh, Nguyen, Thanh Son, Nguyen, Truong Khoa (2008). Using multi-criteria analysis as a tool to select the feasible measures for sustainable development of braskish water shrimp culture in Quang Tri Province. *VNU Journal of Science, Earth Sciences,* 24(2), 66-78.

17. Nguyen, Huu Khai, **Tran, Anh Phuong (**2005). Coupled hydrologic-hydraulic modelling for flood prediction in Huong river basin. Journal of Vietnam Hydrometeorology, 11(539), 12-19 (In Vietnamese).

Submitted

1. **Anh Phuong Tran**, Dafflon, Baptiste, Hubbard, Susan S. Coupled Land Surface-Subsurface Inverse Modeling to Investigate Arctic Hydrological and Thermal Dynamics and Soil Organic Content using Hydrogeophysical Data. *Submitted The Cryosphere.*
2. Dafflon, Baptiste, Oktem, Rusen, Peterson, John, Ulrich, Craig, **Tran, Anh Phuong**, & Hubbard, Susan. Above- and below-ground monitoring of arctic tundra to investigate temporal and spatial variability in soil properties and their interaction with vegetation dynamics. *Submitted to Geophysics*
3. Wang, Changhong, **Tran, Anh Phuong**, Osorio-Murillo, Carlos Andres, Zhu, Hehua, and Rubin, Yoram. Bayesian approach calibrating transformation model from spatially varied CPT data to regular geotechnical parameters. *Submitted to Engineering Geology.*

Book Chapter

1. **Tran, Anh Phuong**, 2014. Full-wave inversion of near-field GPR data for hydrogeophysical characterization of soil. PhD Thesis.
2. Minet, Julien; Jadoon, Khan Zaib; Jonard, François; Mahmoudzadeh, Mohammad; **Tran, Anh Phuong**; Lambot, Sébastien. Advanced ground-penetrating radar for soil moisture retrieval. In book: *Multiscale Hydrologic Remote Sensing: Perspectives and Applications*, Publisher: CRC Press, Editors: Chang, Ni-Bin and Hong, Yang, 9-32. doi: 10.1201/b11279-4
3. **Tran, Anh Phuong** and Lambot, Sébastien. Development of intrinsic models for describing near-field antenna effects, including antenna-medium coupling, for improved radar data processing using full-wave inversion. In *Civil Engineering Applications of Ground Penetrating Radar*, Publisher. Springer, Editors: Benedetto, Andrea and Pajewski, Lara, 219-238. Doi: http://dx.doi.org/10.1007/978-3-319-04813-0_9

Conference Proceedings

1. **Tran, Anh Phuong**, & Lambot, Sébastien. (2014). Intrinsic modeling of antenna array in near-field conditions. In Proceedings of the 15th International Conference on Ground Penetrating Radar, 519-524. Doi: 10.1109/ICGPR.2014.6970478
2. Mertens, Laurence, **Tran, Anh Phuong**, & Lambot, Sébastien. (2014). Determination of the stability of a pulse GPR system and quantification of the drift effect on soil material characterization by full-wave inversion. In Proceedings of the 15th International Conference on Ground Penetrating Radar, 479-483. Doi: 10.1109/ICGPR.2014.6970471
3. De Coster, Albéric, **Tran, Anh Phuong**, & Lambot, Sébastien. (2014). Impact of the antenna offset and the number of frequencies on layered media reconstruction using full-wave inversion in near-field conditions. In Proceedings of the 15th International Conference on Ground Penetrating Radar, 491-496. Doi: 10.1109/ICGPR.2014.6970473
4. Mourmeaux, Nicolas, **Tran, Anh Phuong**, & Lambot, Sébastien. (2014). Soil permittivity and conductivity characterization by full-wave inversion of near-field GPR data. In Proceedings of the 15th International Conference on Ground Penetrating Radar, 497-502. Doi: 10.1109/ICGPR.2014.6970474
5. André, Frédéric, **Tran, Anh Phuong**, Mourmeaux, Nicolas, Mahmoudzadeh Ardekani, Mohammad Reza, Bogaert, Patrick, & Lambot, Sébastien (2013). Integrated modeling of near-field ground-penetrating radar and electromagnetic induction data for digital soil mapping. Bornimer Agrartechnische Berichte, Heft 82, 211-219.
6. Mourmeaux, Nicolas, **Tran, Anh Phuong**, André, Frédéric, & Lambot, Sébastien. (2013). Near-

field Ground-penetrating Radar Modeling for Characterization of a Reference Water Layer at Low Frequencies. In EarthDoc (p. p. WeP01).

7. Mertens, Laurence, **Tran, Anh Phuong**, & Lambot, Sébastien. (2013). Towards physically-based filtering of the soil surface, antenna and coupling effects from near-field GPR data for improved subsurface imaging. In proceeding 6th International Workshop on Advanced Ground Penetrating Radar. doi: 10.1109/IWAGPR.2013.6601524
8. Lambot, Sébastien, **Tran, Anh Phuong**, & André, Frédéric. (2012). Near-field modeling of radar antennas for wave propagation in layered media: When models represent reality. In Proceedings of 14th International Conference on Ground Penetrating Radar. 42-46. doi: 10.1109/ICGPR.2012.6254829
9. André, Frédéric, **Tran, Anh Phuong,** Mourmeaux, Nicolas, & Lambot, Sébastien. (2012). Integrated modeling of near-field ground-penetrating radar and electromagnetic induction data for reconstructing multilayered media. In Proceedings of 14th International Conference on Ground Penetrating Radar. 407-412. doi: 10.1109/ICGPR.2012.6254900
10. **Tran, Anh Phuong**, Wiaux, François, & Lambot, Sébastien (2012). Soil moisture estimation using full-wave inversion of near- and far-field ground-penetrating radar data: A comparative evaluation. In Proceedings of 14th International Conference on Ground Penetrating Radar, 296 - 300. Doi: 10.1109/ICGPR.2012.6254877
11. **Tran, Anh Phuong**, Warren, C., André, Frédéric, & Lambot, Sébastien (2011). Numerical Evaluation of a Full-Wave Antenna Model for Near Field Applications. In proceeding 6th International Workshop on Advanced Ground Penetrating Radar. Doi: 10.1109/IWAGPR.2011.5963849

Conference Abstract

1. **Tran, Anh Phuong**, Dafflon, Baptiste, Hubbard, Susan S., Kowalsky, Michael B., Tokunaga, Tetsu K, Faybishenko , Boris, Long, Phillip, Monitoring Soil Hydraulic and Thermal Properties using Coupled Inversion of Time-lapse Temperature and Electrical Resistance Data, AGU General assembly, San Francisco, United States. 2014.
2. De Coster, Albéric, **Tran, Anh Phuong**, & Lambot, Sébastien (2014). Information content in frequency-dependent, multi-offset GPR data for layered media reconstruction using full-wave inversion. Geophysical Research Abstracts, 16, EGU2014-658-1.
3. Lambot, Sébastien, Mahmoudzadeh Ardekani, Mohammad Reza, **Tran, Anh Phuong**, Nottebaere, Martijn, Leonard, Aline, Defourny, Pierre, & Neyt, Xavier. (2014). High-resolution mapping of soil moisture at the field scale using ground-penetrating radar for improving remote sensing data products. In Geophysical Research Abstracts, vol.16 (p. p. EGU2014-9991).
4. Van Oost, Kristof, Nadeu Puig-Pey, Elisabet, Wiaux, François, Wang, Zhengang, Stevens, François, Vanclooster, Marnik, **Tran, Anh Phuong**, Bogaert, Patrick, Doetterl, Sebastian, Lambot, Sébastien, & van Wesemael, Bas. (2014). Soil organic matter dynamics and CO2 fluxes in relation to landscape scale processes: linking process understanding to regional scale carbon mass-balances. In Geophysical Research Abstracts, vol.16 (p. p. EGU2014-11107).
5. **Tran, Anh Phuong**, Vanclooster, Marnik, & Zupanski, Milija. (2014). Joint Estimation of Soil Moisture Profile and Hydraulic Parameters by Ground-penetrating Radar Data Assimilation with Maximum Likeli-hood Ensemble Filter. Communication présentée à PhD Student Day ENVITAM, Espace Senghor, Gembloux.
6. **Tran, Anh Phuong**, André, Frédéric, & Lambot, Sébastien (2013). Soil Moisture Characterization using a new Full-wave, Near-field Antenna Model: From Laboratory to Field Applications. Communication présentée à International Conference NovCare 2013, Helmholtz Centre for Environmental Research, Leipzig, Germany.

7. André, Frédéric, **Tran, Anh Phuong**, Mourmeaux, Nicolas, & Lambot, Sébastien.(2013). Intrinsicmodeling of near-field ground penetrating radar and electromagnetic induction antennas for layered medium characterization. In Geophysical Research Abstracts, vol.15 (p. p. EGU2013-11565). Vienna, Austria: Copernicus.
8. Lambot, Sébastien, **Tran, Anh Phuong**, & André, Frédéric (2012). A closed form full-wave radar model for near-field layered media reconstruction. Communication présentée à XIX Riunione Nazionale di Elettromagnetismo, Rome (Italy).
9. Lambot, Sébastien, **Tran, Anh Phuong**, & André, Frédéric (2012). Far-field and near-field modeling of ground-penetrating radar for digital soil mapping. Communication présentée à 16th International Water Technology Conference, Istanbul, Turkey.
10. Mahmoudzadeh Ardekani, Mohammad Reza, **Tran, Anh Phuong**, Minet, Julien, Vanclooster, Marnik, & Lambot, Sébastien (2012). Ground-penetrating radar for temporal soil moisture variability analysis along a land slope. Communication présentée à EGU General Assembly 2012, Vienna (Austria).
11. Mourmeaux, Nicolas, André, Frédéric, **Tran, Anh Phuong**, & Lambot, Sébastien (2012). Modeling of near-field ground-penetrating radar for digital soil mapping. Communication présentée à PhD Student Day ENVITAM, Espace Senghor, Gembloux.
12. Lambot, Sébastien, **Tran, Anh Phuong**, & André, Frédéric (2012). Near-field modeling of radar antennas for wave propagation in layered media: when models represent reality. Communication présentée à 14th International Conference on Ground Penetrating Radar (GPR 2012), Shanghai (Chine).
13. Lambot, Sébastien, **Tran, Anh Phuong**, & André, Frédéric (2012). On the importance of modeling antenna- material coupling for quantitative characterization using GPR. Communication présentée à 18th European Meeting of Environmental and Engineering Geophysics of the Near Surface Geoscience Division of EAGE - Workshop "New Developments on GPR theory and applications", Paris (France).
14. **Tran, Anh Phuong**, & Lambot, Sébastien (2012). Temporal and spacial characterization of soil moisture by near-field GPR data. Communication présentée à PhD Student Day ENVITAM, Espace Senghor, Gembloux.
15. **Tran, Anh Phuong**, Mahmoudzadeh Ardekani, Mohammad Reza, & Lambot, Sébastien (2011). Frequency dependence of soil permittivity and conductivity estimated by ground-penetrating radar full-waveform inversion. EGU General assembly, Vienna, Austria.