



# KEURFONLUU

## Ph. D. in Geophysics

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### ABOUT ME

I am an engineer with a keen interest for everything related to computers. I attach great importance to user experience and develop user-friendly codes and softwares that are also computationally efficient. I am particularly interested in numerical optimization problems in geophysical imaging, high performance computing on parallel architecture, and machine learning. My several research jobs allowed me to gain a strong practical experience in software design and master several computer languages such as Fortran and Python.

### EXPERIENCE

#### Post-Doctoral fellow at [Berkeley Lab](#)

2019 – Ongoing      Berkeley, CA, United States

- Hydromechanical modeling of Illinois Basin – Decatur Project using TOUGH-FLAC and modeling of microseismicity induced by injection of CO<sub>2</sub>.

#### Research engineer at [MINES ParisTech](#)

2015 – 2018      Fontainebleau, France

- Numerical optimization of inverse problems in geophysics using stochastic evolutionary algorithms (e.g. genetic algorithm): earthquake location, transmitted waves tomography (1D medium), refracted waves tomography (2D medium), surface wave dispersion curves inversion
- Hybrid parallel computing using MPI + OpenMP (Fortran)
- Development of an automated multi-attributes phase picking algorithm using an artificial neural network with uncertainty quantification (Python)

#### Research engineer (internship) at [TOTAL](#)

2015 (5 months)      Pau, France

- Feasibility of passive seismic tomography on onshore domain
- Development and implementation of a workflow to process ambient noise data, numerical optimization of an inverse problem to retrieve an S-wave velocity model
- Application of the methodology on a real data set (Matlab)

#### Research engineer (internship) at [CGG](#)

2014 (6 months)      Oslo, Norway

- Development and implementation of a method to attenuate vibration noise in 4C multicomponent towed streamer
- Validation of the methodology on synthetic and real data set (Matlab)

#### Geophysicist (internship) at [SIXENSE Geophysics](#)

2013 (2 months)      Nanterre, France

- Project Castor 2013 : acquisition, analysis and processing of electrical resistivity data in the RER C tunnel

### EDUCATION

#### Ph. D. in Geophysics at [MINES ParisTech - PSL](#)

2015 – 2018

#### Master of Research in Exploration Geophysics at [Institut de Physique du Globe de Paris](#)

2014 – 2015

#### Engineering degree in Earth Sciences

#### at [Sorbonne University](#)

2011 – 2014

ERASMUS exchange student at University of Oslo (Norway)

#### Preparatory classes for entrance to Grandes Écoles at [Lycée Saint Louis](#)

2009 – 2011

Option: Physics and Chemistry

#### French Baccalauréat at [Lycée Charles le Chauve](#)

2009

Graduated in Sciences with Honors

### COMPUTER SKILLS



Libraries : MPI, OpenMP, Pandas, Seaborn, Scikit-Learn, Plotly Dash

## PUBLICATIONS

📅 2021

Antonio Rinaldi, Jonny Rutqvist, **Keurfon Luu**, Laura Blanco-Martín, Mengsu Hu and Manuel L. Santís  
TOUGH3-FLAC3D: A Modeling Approach for Parallel Computing of Fluid Flow and Geomechanics

📅 2020

**Keurfon Luu**  
toughio: Pre- and post-processing Python library for TOUGH  
*Journal of Open Source Software*

📅 2019

**Keurfon Luu**, Mark Noble, Alexandrine Gesret and Philippe Thierry  
Toward large scale stochastic refraction tomography: a comparison of three evolutionary algorithms  
*Geophysical Prospecting*

📅 2018

Marc Peruzzetto, Alexandre Kazantsev, **Keurfon Luu**, Jean-Philippe Métaxian, Frédéric Hugué and Hervé Chauris  
Broadband ambient noise characterization by joint use of cross-correlation and MUSIC algorithm  
*Geophysical Journal International*  
doi:10.1093/gji/ggy311

**Keurfon Luu**, Mark Noble, Alexandrine Gesret, Nidhal Belayouni and Pierre-François Roux  
A parallel competitive Particle Swarm Optimization for non-linear first arrival traveltimes tomography and uncertainty quantification  
*Computers and Geosciences*  
doi:10.1016/j.cageo.2018.01.016

📅 2017

**Keurfon Luu**, Mark Noble, Alexandrine Gesret, Nidhal Belayouni and Pierre-François Roux  
Propagation of velocity uncertainties to Microseismic locations using a competitive Particle Swarm Optimizer  
*79th EAGE Conference and Exhibition 2017*

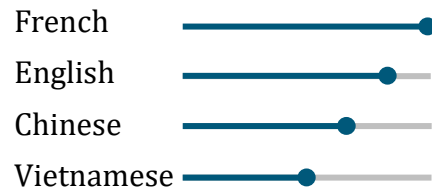
François Bonneau, **Keurfon Luu**, Aurélien Nicolas and Zhi Li  
Toward an understanding of the relationship between fracturing process and microseismic activity: study at the laboratory scale  
*2017 RING Meeting*

📅 2016

**Keurfon Luu**, Mark Noble and Alexandrine Gesret  
A competitive Particle Swarm Optimization for non-linear first arrival traveltimes tomography  
*SEG Technical Program Expanded Abstracts 2016*  
doi:10.1190/segam2016-13840267.1

Zhi Li, **Keurfon Luu**, Aurélien Nicolas, Jérôme Fortin and Yves Guéguen  
Fluid-induced rupture on heat-treated andesite  
*4th International Workshop on Rock Physics*

## LANGUAGES



## CERTIFICATIONS

Unconventional Reservoir Geomechanics  
by [Stanford University](#)  
📅 2019

Reservoir Geomechanics  
by [Stanford University](#)  
📅 2019

Machine Learning  
by [Stanford University](#)  
📅 2017  
License: JUNX5PUCZBMD

TOEIC  
📅 2013  
Score: 935/990

HSK (Chinese)  
📅 2009  
Level: intermediate

## REFERENCES

Mark Noble  
Senior Research Fellow  
at [MINES ParisTech](#)  
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Philippe Thierry  
Principal Engineer  
at [Intel Corporation](#)  
@ philippe.thierry@intel.com

Pierre-François Roux  
Senior Seismologist  
at [Baker Hughes, a GE company](#)  
@ pierre-francois.roux@bhge.com

Guillaume Bergery  
Senior Microseismic Geophysicist  
at [Total](#)  
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