# Abdelali DADDA

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## SKILLS

### Computer science

**Simulation**:
COM-SOL MP, YADE

**Programming**:
MATLAB, C++, Python, Fortran

**Image processing**:
ImageJ, VGStudio, Visilog

**Operating systems**:
Windows, GNU/Linux

### Techniques and R & D

- Robust knowledge of geotechnical tests in the laboratory and in situ (triaxial, oedometric, penetrometer, geophysical measurements ...)
- Excellent knowledge of 3D image processing (X-ray micro-tomography, advanced imaging computations)
- Good knowledge in numerical modelling multiphysics, finite elements and discrete elements

### Languages

**Arabic** Native language

**French** Fluent

**English**
Intermediate

### Hobbies

Biotechnology, travel, history, ping pong, Soccer, hiking

## TRAINING AND DIPLOMA

- **Post-doctoral position (Ecole des ponts Paris-Tech – Navier laboratory)** *Since January 2018*
- **Subject**: Influence of the inclusions on the clayley soil cracking by desiccation
- **Supervisor:** *Anh Minh Tang, Michel Bornert and Matthieu Vandamme*

- **PhD** *2014-2017* **Alpes University, Grenoble, France**
- **Area: Materials, Mechanics, Civil Engineering, Electrochemistry (2MGE)**
- **Thesis title** : Improvement of the mechanical characteristics of soils by biological calcification
- **Supervisor :** *Fabrice Emeriault et Christian Geindreau*

- **MSc.** *2013-2014* Ecole Nationale des Ponts et Chaussées (ENPC)
- **Area: Mechanics of Soils, Rocks and Structures in their Environment**
- **Subject:** Influence of grain crushing of sand on its mechanical, physical and microstructural properties
- **Engineering Degree** *2007-2012,* Ecole Nationale Supérieur des Travaux Publics d'Alger (ENSTP), Algeria
- **Area : Civil Engineering**
- **Subject:** Railroad design of high speed trains

## OTHER TRAINING

**Doctoral school of Grenoble Alpes University** *2014-2017*

- Quantitative analysis of microstructures
- Mechanical modelling with the discrete element method (DEM)
- Advanced experimental geomechanics
- Quantitavie imaging with X-rays and Neutrons

**Other**
*2011-2012*
Business start-ups (ALSTOM) and association managements (TADJ)

## PROFESSIONAL EXPERIENCE

**Higher education**
*2014-2017*
Teaching soil mechanics, structure design and mathematics courses at Grenoble Alpes University

**Engineering**
*2012-2013*
Project manager at Public Works Department (Algeria) and Engineer in the road construction and geotechnical laboratory (LGCR).

# DETAILS OF ACTIVITIES

## Research activities

**NAVIER laboratory (CERMES – Multi-échelle), Champs-sur-Marne** 2018 – 2019

- Influence of heterogeneities on the clayey soil cracking by desiccation
  - Following the cracks in 2D by using vertical and inclined cameras and image correlation technique
  - Following the crack development in 3D by X-ray micro-tomography and image correlation technique
  - Tensile strength measurements in different water content (input data for modelling)

**Laboratoire Sols Solides Structures et Risques (3SR), Grenoble** 2014-2017

- Study of the behavior of bio-cemented materials in the laboratory
  - Preparation of bacterial and chemical solutions
  - Realization of drained and undrained triaxial tests
- Microstructural study using X-ray micro-tomography and advanced imaging processing tools
  - Computation of microstructural properties: Matlab, Python
  - Computation of physical properties: GeoDict
- **Modelling of mechanical behavior by discrete element method (DEM)**
  - Programming C++, implemented in YADE
- Studying the **chemical durability** of the biocement (calcite) and its influences on the **mechanical properties degradation (laboratory study + in-situ microstructural observations**)
  - Development of an experimental device (Triaxial, Bender elements, pH meter, conductimeter)
  - Microstructural study of the dissolution phenomenon (*in-situ* test : micro-tomography)

**NAVIER laboratory – (CERMES), Champs-sur-Marne** 2013 - 2014

- Effect of sand grain breakage on microstructural change and physical properties
  - Performing oedometric tests on sand with permeability measurements
  - Measurement of pore size distribution with tensiometric technique and mercury porosimetry
- Effect of pile diameter on friction resistance

## Teaching activities

**Université Joseph Fourier (UJF), Grenoble**

- TD / TP dimensionnement des structures (DDS) (28h) 2017
- Cours / TD mathématique (32h) 2015-2016
- Encadrement Master 2 (GCER) 2016-2017

**Polytech' Grenoble, Grenoble**

- TD / TP mécanique des sols (40h) 2016-2017
- Encadrement des élèves ingénieurs 2017

## Administrative positions

**Laboratoire Sols Solides Structures et Risques (3SR), Grenoble**
Member of the Scientific Council of the 3SR Laboratory 2015 - 2017

**Ecole Nationale Supérieure des travaux publics (ENSTP)**
Member of the Administrative Council of ENSTP 2010- 2012

## Professional Experience

**Public works Direction El-oued - Algeria** 2013
Project manager engineer

- Project management
- Economic feasibility studies of the infrastructural projects

**Geotechnical laboratory of road construction, El-oued – Algeria** 2012- 2013
Technical inspection in the laboratory

**Algerian Society of Technical Studies of Infrastructure, Algiers – Algeria** 2011
Trainee
- Supervision and control of earthworks and concreting
- Technical control in the geotechnical laboratory

**Building and civil engineering laboratory, El-Oued – Algeria** 2010
Trainee
- Control of road projects
- Laboratory tests
- Design of road projects

## Journal articles

**Dadda A**., Geindreau C., Emerialut F., Rolland du Roscoat S., Sapin L., Esnault Filet A., Duchesne L., Garandet A., (2017) Characterisation of microstructural and physical properties change in sand induced by biocemented using 3D X-ray synchrotron microtomography. *Acta Geotechnica*, 12(5): 955-970. (DOI: 10.1007/s11440-017-0578-5)

**Dadda A**., Geindreau C., Emeriault F., du Roscoat S. R., Filet A. E., & Garandet A. (2018). Characterization of contact properties in biocemented sand using 3D X-ray micro-tomography. *Acta Geotechnica*, 1-17.

**Dadda A**., Geindreau C., Emeriault F., Esnault Filet A., & Garandet A. (2019). Influence of the microstructural properties of biocemented sand on its mechanical behavior. International Journal for Numerical and Analytical Methods in Geomechanics, 43(2), 568-577.

**Dadda A**., Geindreau C., Emerialut F., Garandet A., (2018) Evolution of strength properties of biocemented sand with the cementation level. Soil and Foundation (Submitted).

**Dadda A**., Geindreau C., Emerialut F., Garandet A., (2018) Evolution of mechanical and microstructural properties of biocemented sand subjected to aggressive chemical solution (Submitted).

**Dadda A**., Feia S., Ghabezloo S., Sulem J., (2018). Grain Breakage effect on microstructure, permeability and mechanical proprties of sand. *Géotechnique* (Submitted).

## Communications

**Dadda A**., Geindreau C., Emerialut F (2018) Influence of the microstructure of biocemented sand on its mechanical properties*. Geomechanics from Micro to Macro in Research and Practice,* Sep 10-13, 2018, Atlanta, USA.

**Dadda A**., Geindreau C., Emerialut F (2018) Durabilité chimique du sable bio-cimenté : étude mécanique et microstructurale*. Journees Nationales Geotechnique Geologie de l'Ingenieur,* Juin 13-15, 2018, Paris, France.

**Dadda A**.,(2017) Relation between microstructural properties and strength parameters of biocemented sands. *6th International Young Geotechnical Engineers' Conference,* Sep 16-17, 2017, Seoul, South Korea.

**Dadda A**., Geindreau C., Emerialut F., Rolland du Roscoat S., Sapin L., Esnault Filet A., Duchesne L., Garandet A.,(2016) Exploration of microstructural and physical properties of biocemented sand using 3D x-ray synchrotron microtomography. *8th International conference on porous media & annual meeting (InterPore 2016), May 9-12, 2016, Cincinnati, Ohio, USA.*

**Dadda A**., Feia S., Ghabezloo S., Sulem J., (2015). Fraturation des grains et l'évolution de la micro-structure d'un sable sous fortes contraintes. *Congrés Algérien de Mécanique (CAM 2015), Octobre 25-27, 2015, El Oued, Algerie.*

## Professional recommendation

- **Fabrice Emeriault (Supervisor)**

Professor, Université Grenoble Alpes UGA
Email : fabrice.emeriault@3sr-grenoble.fr

- **Christian Geindreau (Co-supervisor of thesis)**

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Email : christian.geindreau@3sr-grenoble.fr

- **Cino Viggiani**

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- **Jean Sulem**

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- **Siavash Ghabezloo**

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- **Anh Minh Tang**

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- **Michel Bornert**

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