

SAMUEL YNIESTA

Assistant Professor, department of Civil, Geological and Mining Engineering, Ecole Polytechnique of Montreal

+1 514-340-4711 ext. 4259 | samuel.yniesta@gmail.com | www.samuelyniesta.com

AREAS OF EXPERTISE

Geotechnical Earthquake Engineering, Geomechanics, Constitutive Modeling, Soil Dynamics, Critical State Soil Mechanics, Numerical Simulations, Stability of Levees, Centrifuge Testing

EDUCATION

University of California, Los Angeles (UCLA) Los Angeles, CA	Ph.D. in Civil and Environmental Engineering <u>Major:</u> Geotechnical Earthquake Engineering <u>Super Minor:</u> Structural Engineering <u>Advisors:</u> Scott Brandenburg and Jonathan Stewart <u>Dissertation:</u> Constitutive Modeling of Peat in Dynamic Simulations	2016
	M.S. in Civil and Environmental Engineering <u>Major:</u> Geotechnical Earthquake Engineering	2012
Ecole Spéciale des Travaux Publics (ESTP) Paris, France	M.S. in Civil Engineering <u>Major:</u> Public Works	2012
Université Claude Bernard Lyon 1 – Institut Universitaire de Technologie A Villeurbanne, France	D.U.T. (Technical University Diploma) in Civil Engineering (2-year Degree) <u>Major:</u> Public Works	2009

PROFESSIONAL CERTIFICATIONS

Junior Engineer – Ordre des Ingénieurs du Québec – No. 5079221

Engineer In Training - State of California - Certificate No. EIT 156198

Title of Graduate Engineer (2012) conferring the right to practice as an engineer in France – French National Commission on Engineering Degrees (CTI)

PUBLICATIONS AND PRESENTATIONS

Journal Publications:

Yniesta, S., Lemnitzer, A., Cappa, R., and Brandenburg, S.J. (2015) "Vacuum Pluviation Device for Achieving Saturated Sand" *Geotechnical Testing Journal*, 38 (3), 355-360

Lemnitzer, A., Cappa, R., **Yniesta, S.** and Brandenburg, S.J. (2016) "Centrifuge Testing of Model Levees atop peaty soils: experimental data". *Earthquake Spectra* August 2016, Vol. 32, No. 3, pp. 1903-1924.

Yniesta, S., Brandenburg, S.J., (2016) "Stress-Ratio-Based Interpretation of Modulus Reduction and Damping Curves" *Journal of Geotechnical and Geoenvironmental Engineering* 10.1061/(ASCE)GT.1943-5606.0001585 , 06016021.

Yniesta, S., Brandenburg, S.J., and Shafiee A. (2017) "One-dimensional Non-linear Model for Ground Response Analysis" *Soil Dynamics and Earthquake Engineering*, 102, 75-85.

Publications in Preparation:

Afacan, K.B. , Shafiee, A., **Yniesta, S.**, Stewart, J.P., and Brandenburg, S.J Total Stress Analysis of Soft Clay Ground Response in Centrifuge Models

Cappa, R., **Yniesta, S.**, Lemnitzer, A. and Brandenburg, S.J “Cyclic and Post-Cyclic Behavior of Levees atop Peaty Organic Soils during Centrifuge Testing” *Journal of Geotechnical and Geoenvironmental Engineering*

Yniesta, S., Brandenburg, S.J., “A 3D Constitutive Model for Dynamic Applications” *International Journal of Geomechanics*

Conference Papers (* student advised):

Janati-Idrissi, M.*, **Yniesta, S.**, 2018 Integration of Viscoplastic Effects in Nonlinear Ground Response Analysis, Geotechnical Earthquake Engineering and Soil Dynamics V conference, Austin, TX, June 10-13 2018 (in review)

Yniesta, S., Brandenburg, S.J. 2018 A Constitutive Model Controlling Damping for 2D and 3D Site Response, Geotechnical Earthquake Engineering and Soil Dynamics V conference, Austin, TX, June 10-13 2018 (in review)

Yniesta, S., Brandenburg, S.J. 2017 Influence of Misfit of Desired Damping Response in Nonlinear Ground Response Analysis, *Proceedings*, 3rd International Conference on Performance-Based Design in earthquake Engineering (PBD-III), Vancouver, Canada, July 16-19 2017

Lemnitzer, A., Cappa, R., **Yniesta, S.**, Stewart, J.P. and Brandenburg, S.J. 2017 Post-Cyclic Settlements of a Levee Structure on Organic Soil during Centrifuge Testing, *Proceedings*, 3rd International Conference on Performance-Based Design in earthquake Engineering (PBD-III), Vancouver, Canada, July 16-19 2017

Yniesta, S., and Brandenburg, S.J. “Unloading Reloading Rule for a One-dimensional Non-linear Model for Site Response Analysis” *Proceedings*, 6th International Conference on Earthquake Geotechnical Engineering (6ICEGE), Christchurch, New Zealand, November 1-4, 2015

Cappa, R., **Yniesta, S.**, Brandenburg, S.J and Lemnitzer, A. “Settlements and excess pore pressure generation in peaty soils under embankments during cyclic loading” *Proceedings*, 6th International Conference on Earthquake Geotechnical Engineering (6ICEGE), Christchurch, New Zealand, November 1-4, 2015

Cappa, R., **Yniesta, S.**, Lemnitzer, A., Brandenburg, S. and Shafiee, A. (2015). “Settlement Estimations of Peat during Centrifuge Experiments “ *Proceedings*, International Foundations Congress and Equipment Exposition (IFCEE), San Antonio, Texas, March 17-21, 2015

Yniesta, S., Cappa, R., Lemnitzer, A. and Brandenburg, S. (2015). “Centrifuge Testing of Levees: Saturation Techniques during Model Construction “ *Proceedings*, International Foundations Congress and Equipment Exposition (IFCEE), San Antonio, Texas, March 17-21, 2015

Cappa, R., **Yniesta, S.**, Lemnitzer, A., Brandenburg, S.J., and Stewart, J.P. (2014). “Centrifuge Experiments to Evaluate the Seismic Performance of Levees on Peaty Soils in the Sacramento-San Joaquin Delta” *Proceedings*, Dam Safety Conference, San Diego, CA, September 21-25, 2014

Data Reports:

Cappa R., **Yniesta S.**, Brandenburg S.J., Lemnitzer A., Stewart J.P. (2014). Averting an Impending Disaster. Data Report for Centrifuge Experiments 12L and 13L. *Data report for NEES* https://nees.org/groups/nees_2012_1161

Cappa R., **Yniesta S.**, Brandenburg S.J., Lemnitzer A., Stewart J.P. (2014). Averting an Impending Disaster. Data Report for Centrifuge Experiments 14L and 15L. *Data report for NEES* https://nees.org/groups/nees_2012_1161

Presentations (Presenters are underlined):

Yniesta S., Brandenburg S.J. “Influence of Misfit of Desired Damping Response in Nonlinear Ground Response Analysis.” 3rd *International Conference on Performance-based Design in Earthquake Geotechnical Engineering (PBD-III), Vancouver BC, July 16-19 2017*

Yniesta S. "A Constitutive Model for Site Response." *Engineering Mechanics Institute Conference, San Diego CA, June 4-7 2017*

Lemnitzer A., **Brandenberg S.J.,** **Cappa R.,** **Yniesta S.** "Levees, peat, earthquakes – rethinking settlements of organic soils under cyclic loading" Invited Lecture, 16th World Conference on Earthquake Engineering, Santiago, Chile, January 10th 2017

Yniesta S. "Centrifuge Experiments to Evaluate the Seismic Performance of Levees on Peaty Soils in the Sacramento San Joaquin Delta." *Midi-Conference, Department of Civil, Geological and Mining Engineering, Ecole Polytechnique of Montréal. Montréal QC, October 24th 2016*

Yniesta S., **Brandenberg S.J.** "A Constitutive Model Controlling Dynamic Properties for 2D Site Response." *Engineering Mechanics Institute Conference, Nashville TN, May 22nd 2016*

Yniesta S., **Brandenberg S.J.** "Constitutive Modeling of Soil in Dynamic Simulations." *Geocongress, Phoenix AZ, February 17th 2016*

Yniesta, S., and **Brandenberg, S.J.** "Unloading Reloading Rule for a One-dimensional Non-linear Model for Site Response Analysis" *6th International Conference on Earthquake Geotechnical Engineering (6ICEGE), Christchurch, New Zealand, November 1-4, 2015*

Yniesta S., **Cappa R.,** **Brandenberg S.J.,** **Lemnitzer A.,** "Centrifuge Testing of Levees: Saturation Techniques during Model Construction." *Geocongress, San Antonio TX, March 19th 2015*

Yniesta S. "Soil Modeling in Site Response Analysis". *Geotech Round Table, UCLA, February 25th 2015*

Yniesta S "Centrifuge Experiments to Investigate Levee Deformation Potential in the Sacramento San Joaquin Delta." *Presentation to the Department of Water Resources, Sacramento CA, October 23rd 2014*

Cappa R., Yniesta S., (2014). "Centrifuge Experiments to Evaluate the Seismic Performance of Levees on Peaty Soils in the Sacramento San Joaquin Delta." *ASDSO Conference, San Diego CA, September 23rd 2014*

Yniesta S., Cappa R. (2014). "Centrifuge Experiments to Investigate Levee Deformation Potential in the Sacramento San Joaquin Delta." *CalGeo Expo, UCLA, May 30th 2014*

Lemnitzer A., Cappa R., Yniesta S., **Brandenberg S.,** **Schmutte C.** (2014). "Centrifuge Experiments to Investigate Levee Deformation Potential in the Sacramento San Joaquin Delta." *ASCE Geoinstitute, San Diego CA, May 28th 2014*

Curated Datasets:

Cappa R., Yniesta S., **Brandenberg S.J.,** **Stewart J.P.,** **Lemnitzer A.** (2014). "TEST 12L - RCK01: Part 1 - 9m radius centrifuge experiment on clayey levee behavior under ground motions", Network for Earthquake Engineering Simulation (distributor), Dataset, DOI:10.4231/D34M91B6S

Cappa R., Yniesta S., **Brandenberg S.J.,** **Stewart J.P.,** **Lemnitzer A.** (2014). "TEST 13L - RCK01: Part 2 - 9m radius centrifuge experiment on sandy levee behavior under ground motion", Network for Earthquake Engineering Simulation (distributor), Dataset, DOI:10.4231/D30V89J2N

Cappa R., Yniesta S., **Brandenberg S.J.,** **Stewart J.P.,** **Lemnitzer A.** (2014). "TEST 14M - RCK02 : Part 1 - 9m radius centrifuge experiment on clayey levee behavior under ground motions", Network for Earthquake Engineering Simulation (distributor), Dataset, DOI:10.4231/D3W37KW7Z

Cappa R., Yniesta S., **Brandenberg S.J.,** **Stewart J.P.,** **Lemnitzer A.** (2014). "TEST 15M - RCK02 : Part 2 - 9m radius centrifuge experiment on sandy levee behavior under ground motions", Network for Earthquake Engineering Simulation (distributor), Dataset, DOI:10.4231/D3RB6W337

RESEARCH EXPERIENCE

Assistant Professor, Ecole Polytechnique de Montréal, Montréal, QC Canada

May 2016 - Present

Current Research Projects:**May 2016 - Present**

- Constitutive model for sensitive clays
- A visco-plastic 1D constitutive model for ground response analysis
- Study of seismically induced landslides in sensitive clay
- Effect of temperature on cyclic behavior of soils

Funding:

- Funding program for new professors at Polytechnique Montréal (PIED) - \$50,000 - Oct. 2016/ Oct. 2018
- Subvention of Polytechnique's Foundation for new professors – \$15,000 - Oct. 2017/ Oct. 2018
- Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery – \$100,000 - April 2017/April 2022

Graduate Student Researcher, University of California Los Angeles**Sept. 2012 - March 2016**

PI: Professeur Scott Brandenberg

Project Funded by NEESR: "Levees and Earthquakes: Averting an Impending Disaster"

NSF# 1208170 (\$651,000)

Development of 3-D Constitutive Model for Peat**Sept. 2012 – Mar. 2016**

- Create a constitutive model for organic soils, which has never been done before
- Develop a formulation that captures the dynamic behavior of peat during an earthquake
- Validate the model against centrifuge, field tests and lab tests
- Implement the model in FLAC for use by practitioners

Development of a Nonlinear 1D Constitutive Model for Ground Response**Sept. 2012- Dec. 2014**

- Developed a model that can be used to measure the response of a column of soil to an input ground motion
- Created a formulation that can match any set of modulus reduction and damping curves
- Implemented a formulation that does not use frequency dependent Rayleigh damping nor a hyperbolic backbone curve

Four Large Centrifuge Tests:**Sept. 2013 - Apr. 2014**

- Planned and designed four centrifuge tests to study the seismic failure potential of levees in the Sacramento-San Joaquin Delta
- Built four models of a levee on top of peat with various configurations
- Solved problems related to the construction of the model such as large initial settlement, low initial strength of the foundation soil, creation of a reservoir on one side of the levee

Creation of a Device to Saturate Levee Fill:**Sept. 2012-Aug. 2013**

- Created a novel device to saturate sand for centrifuge applications
- Validated the method with various techniques to evaluate saturation
- Presented the method in a journal publication and during the Geotronics 2015 in San Antonio

OTHER WORK EXPERIENCE (SELECTED)**Teaching and Mentoring Experience:****Polytechnique Montréal - department of Civil, Geological and Mining Engineering
Assistant Professor****Since May 2016**

- CIV3415 – Soil mechanics - 3rd year
- CIV3420 – Foundation engineering - 3rd year

- CIV6405 – Geotechnical engineering (co-instructor) – graduate level
- CIV6414 – Geotechnical earthquake engineering (created the course) – graduate level

**University of California, Los Angeles – Department of Civil and Environmental Engineering
Teaching Assistant (CEE123 Advanced Geotechnical Design)**

April. 2015 - June 2015

- Organize and animate weekly discussions
- Develop the course material and assignments
- Grade homework and the final project

**University of California, Los Angeles – Department of French and Francophone Studies
Teaching Assistant (6 quarters)**

Sept. 2011 - June 2013

- In charge of one class of about 25 students per quarter
- Taught one hour a day, five days a week for ten-week quarters
- Prepared all lesson plans, class activities and exams

Engineering-Related Work Experience:

SOGEA TPI, Chevilly-Larue, France

May 2011 - Aug.2011

Assistant to the Construction Manager (3 months)

- Managed the construction of a portion of the extension of the tramway line T3 in Paris
- Directed 10 workers on the site
- Replaced the Construction Manager for 3 weeks: managed workers and interacted with the subcontractors, the suppliers and the project manager
- Used Autocad to solve technical problems and present solutions to the project manager
- Organized a complete schedule of the site until the end of the construction using Microsoft Project

Groupe J, Rillieux-La-Pape, France

June 2010 - July 2010

Geotechnical Engineering Intern (8 weeks)

- Performed Field Testing: inclinometers, verification of soil nails, in-situ compaction evaluation, pressuremeter and penetrometer tests
- Conducted Lab Testing: Atterberg Limits, grain size distribution, triaxial tests, consolidation tests, Proctor
- Performed several numerical simulations to solve slope stability problems for embankments in a large railroad project (TGV, a high-speed train in eastern France)
- Implemented alternative solutions when slopes were found to be unstable
- Documented the analysis in technical reports

Forézienne d'Entreprises, Saint-Etienne, France

June 2009 - Aug 2009

Quantity Surveyor Intern (9 weeks)

- Analyzed the invitation to tender for road construction projects, looked for cost-efficient alternative solutions
- Negotiated with potential subcontractors and potential suppliers
- Calculated the cost and helped preparing the response to the call to tender on several projects
- Prepared the response to the call to tender: schedule, crew, material, for a \$300,000 project

SERVICE

Scholarly review for:

- Geocongress 2015 (IFCEE2015) and Geocongress 2017
- Computer and Geotechnics (Elsevier) since 2015
- Journal of Geotechnical Testing (ASTM) since 2016
- Journal of Geotechnical and Geoenvironmental Engineering (ASCE) since 2016

- PBDIII Vancouver 2017

Representative of the department of civil, geological and mining Engineering, at the professors' association of Polytechnique board meeting (APEP)

May 2017 - Present

Member of the Geo-Institute Graduate Student Organization at UCLA

Apr. 2013 - Present

- Coordinated roundtables three times per quarter where a student presents his research to the geotechnical group at UCLA
- Organized quarterly geotechnical social events for both students and professors

AFFILIATIONS

Canadian Geotechnical Society since 2016

Engineering Mechanics Institute since 2016

Canadian Association of Earthquake Engineering since 2016

SKILLS

Computer Skills:

Programming Languages:

Visual Basic, C++

Geotechnical Engineering Software:

Phase 2.0, Slide, FLAC, OpenSees

Languages:

English – Fluent

French – Native

Italian – Proficiency in reading and writing

AWARDS

Subvention of Polytechnique's Foundation for new professors: 2017

Itasca Mentorship Program (2015)

National Federation of Public Works Scholarships (2010, 2011 and 2012) – Fédération Nationale des Travaux Publics (FNTP)

Alumni Association of the Ecole Spéciale des Travaux Publics (ESTP) scholarships (2010 and 2011) – SID-ETP

National Scholarship for Excellence (2003-2006) - Bourse au Mérite