Konstantinos Karapiperis

Curriculum Vitae

385 S. Catalina Ave
Pasadena, CA, USA
+1 (530) 304 8638
kkarapip@caltech.edu

Personal details

Birth	02/08/1989
Gender	Male
Citizenship	Greek

Education

2015 — **California Institute of Technology, USA**, PhD in Applied Mechanics, Minor in Applied and Computational Mathematics, Expected (2020).
Dissertation: Multiscale and data-driven modeling of granular materials

2013–2015 — **University of California, Davis, USA**, MSc in Civil Engineering, Grade: 4.0/4.0.
Thesis: Intrusive Stochastic Inelasticity

2007–2012 — **National Technical University of Athens, Greece**, Diploma in Civil Engineering, Grade: 9.0/10.

Research Profile

My current interest lies in the intersection of mechanics and applied mathematics, in particular investigating the mechanics and physics of granular and amorphous materials, linking material microstructure to emergent macroscopic behavior, and modeling complex systems using data-driven and machine learning techniques.

Experience

Academic

2017–2019 — **Teaching Assistant**, *Caltech*, Static and Dynamic Failure of Brittle Solids and Interfaces, Mechanics and Rheology of Porous media, Plasticity.

2013–2015 — **Graduate Student Researcher**, *UC Davis*.

2013–2014 — **Teaching Assistant**, *UC Davis*, Mechanics and Statics of Materials.

Working

2012 — **Greek Army, Corps of Engineers**.

2011 — **Archirodon N.V**, *Athens*, Greece.
Construction Support Trainee Engineer

Scholarships and Awards

2018 — **Hartley Fellowship (Caltech)**.

2015 — **Civil Engineering Option Fellowship (Caltech)**.

2013 — **Accepted for Fullbright Scholarship** .

2008–2012 — **State Scholarship Foundation (IKY)**, *Highest performance in a year (2008, 2011, 2012), Highest performance in math (2008), Admission with Honors (2008).*

Refereed Publications

Published

Bhattacharya D., Kawamoto R., *Karapiperis K.*, Andrade J.E., Prashant A. (2020), *"Mechanical Behaviour of Granular Media in Flexible Boundary Plane Strain conditions: Experiment and Level-Set Discrete Element Modelling, Acta Geotechnica".*

***Karapiperis K.*, Marshall, J.P, Andrade J.E. (2019)**, *"Reduced gravity effects on the strength and flow of granular matter: DEM simulations vs experiments", Journal of Geotechnical and Geoenvironmental Engineering.*

***Karapiperis K.*, Sett K., Kavvas M.L., Jeremic B. (2015)**, *"Fokker-Planck Linearization for non-Gaussian Stochastic Elastoplastic Finite Elements", Computer Methods in Applied Mechanics and Engineering.*

Zafeirakos Th, Gerolymos N., *Karapiperis K.* (2015), *"Generalized failure envelope for embedded foundations in cohesive soil: Static and dynamic loading", Soil Dynamics and Earthquake Engineering.*

***Karapiperis K.*, Gerolymos N. (2014).**, *"Combined Loading of Caisson Foundations in Cohesive Soil: Finite Element versus Winkler Modeling", Computers and Geotechnics, Vol. 56, pp. 100-120.*

Under review

***Karapiperis K.*, Stainier L, Ortiz M., Andrade J.E. (2020)**, *"Multiscale Data-Driven Modeling of Granular Materials", Computer Methods in Applied Mechanics and Engineering.*

***Karapiperis K.*, Andrade J.E. (2019)**, *"Nonlocality in Granular Complex Networks: Linking Topology, Kinematics and Forces", Extreme Mechanics Letters.*

Harmon J., *Karapiperis K.*, Li L., Moreland, S., Andrade J.E. (2020), *"Particle Bonding within the Level Set Discrete Element Method for Modeling Connected Granular Media".*

***Karapiperis K.*, Harmon J., Andò E., Viggiani G., Andrade J.E. (2019)**, *" Investigating the Incremental Behavior of Granular Materials with In Silico Experiments", Journal of the Mechanics and Physics of Solids.*

Conference Publications/Presentations

Jostad H.P., Khoa H.D.V., *Karapiperis K.* and Andrade J.E. (2018), *"Can LS-DEM be used to simulate cyclic behavior of sand?", International Conference of the International Association for Computer Methods and Advances in Geomechanics, Turin, IT, June 30, 2020.*

***Karapiperis K.*, Andrade (2018)**, *"The Elusive Granular Length Scale: Continuum vs Discrete", World Congress of Computational Mechanics, New York, NY, July 22-27, 2018.*

***Karapiperis K.*, Andrade, J.E, Marshall J.P. (2017)**, *"Reduced gravity effects on the failure and flow of sand: DEM simulations vs experiments", Engineering Mechanics Institute Conference, San Diego, CA, June 4-7, 2017.*

Jeremic B., Sett K., *Karapiperis K.*, Abell J. (2015), *"Dynamics of Soils and Structures under Uncertainty", 1st International Conference on Uncertainty Quantification in Computational Sciences and Engineering, Crete, Greece, May 22-25, 2015.*

***Karapiperis K.*, Watanabe K., Luo C., Abell J., Pisano F., Sett K., Jeremic B. (2015)**, *"On Uncertainties and Seismic Ground Motions Modeling and Simulation", 6th International Conference on Earthquake Geotechnical Engineering, Christchurch, New Zealand, Nov 1-4, 2015.*

***Karapiperis K.*, Jeremic B., Sett K. (2015)**, *"A meshless radial basis function solution to the Fokker-Planck-Kolmogorov Equations of Probabilistic Elastoplasticity", 1st International Conference on Uncertainty Quantification in Computational Sciences and Engineering, Crete, Greece, May 22-25, 2015.*

Invited talks

***Karapiperis K.*, *"Lessons from virtual experiments on sands: Mapping the granular genome", Knowles Solid Mechanics Symposium, Caltech, Pasadena, CA, May 17, 2019.*

***Karapiperis K.*, *"Stochastic Plasticity and Dynamics", Department of Civil Engineering, NTUA, Athens, Greece, Sep 7, 2015.*

Student Mentoring Experience

Eleni Blatsouka, *2019*, Visiting Summer research fellow - Caltech, *Project: Stability of entangled granular structures under vibration.*

Debayan Bhattacharya, *2017*, Visiting Graduate student - Caltech, *Project: Instabilities in granular matter with flexible boundaries.*

Computer Skills

Languages **C++, Fortran, Python, Mathematica**.

Software **Tensorflow, ABAQUS, AutoCAD, LaTeX**.

Languages

Greek, *Native speaker.*

English, *Excellent (Proficiency of Cambridge/Michigan, ETS TOEFL/GRE).*

German, *Fluent (Zentrale Mittelstufenprufung Zeugnis).*

Affiliations

American Society of Civil Engineers (ASCE).

Society of Industrial and Applied Mathematics (SIAM).

Technical Chamber of Greece (TEE).

Interests and Hobbies

Rock climbing, Snowboarding, Mountaineering, Travelling

References

Available upon request