

Lu Jing

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EDUCATION

The University of Hong Kong , Hong Kong, China <i>PhD</i> in Geotechnical Engineering Advisor: Dr. Fiona Kwok Dissertation: Segregation, runout and deposition of debris flow	2013-2017
Tongji University , China <i>MEng</i> in Geotechnical Engineering	2010-2012
Tongji University , China <i>BEng</i> in Civil Engineering	2006-2010

RESEARCH EXPERIENCE

Northwestern University , USA <i>Postdoctoral Fellow</i> in the Department of Chemical and Biological Engineering (Laboratory for Complex Systems and Nonlinear Dynamics in Fluids and Granular Materials) Advisors: Prof. Richard M. Lueptow, Prof. Julio M. Ottino, Prof. Paul Umbanhowar	2018-
University of Twente , The Netherlands <i>Visiting Scholar</i> in the Multi-Scale Mechanics Group Hosts: Prof. Anthony Thornton, Prof. Thomas Weinhart	2018
The University of Hong Kong , Hong Kong, China <i>Senior Research Assistant</i> in the Department of Civil Engineering Principal Investigator: Dr. Fiona Kwok	2017-2018

HONORS & AWARDS

Best Paper Award for Young Researcher International Geotechnics Symposium, Hong Kong	2016
Most Accessed Article International Journal for Numerical and Analytical Methods in Geomechanics	2016
Excellent Graduate Student Scholarship Tongji University	2011

GRANTS INVOLVED

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| <p>GOALI: Flow driven segregation at the particle level
 Sponsor: National Science Foundation, USA
 PI & Co-PIs: Richard M. Lueptow, Julio M. Ottino, Paul Umbanhowar
 Role: Trainee</p> | 2019-2022 |
| <p>Study on debris flow transport mechanisms based on coupled fluid-particle method
 Sponsor: State Key Laboratory of Geohazard Prevention and Geoenvironment Protection (Chengdu University of Technology), China
 PI: Fiona Kwok
 Role: Participant</p> | 2018-2019 |
| <p>Experimental & numerical investigation of depositional mechanism of mountainside debris flows
 Sponsor: State Key Laboratory of Hydraulics and Mountain River Engineering (Sichuan University), China
 PI: Fiona Kwok
 Role: Participant</p> | 2017-2018 |
| <p>Coupled fluid-particle modeling for debris flows
 Sponsor: Research Grants Council of Hong Kong, Hong Kong
 PI: Fiona Kwok
 Role: Graduate student</p> | 2015-2017 |

PUBLICATIONS

Prepared / Submitted

1. **Jing, L.**, Ottino, J. M., Lueptow, R. M., & Umbanhowar, P. B. (2020) A unified description of gravity- and kinematics-induced segregation forces in dense granular flows. *Prepared for Journal of Fluid Mechanics*.

Journal Papers

1. **Jing, L.**, Ottino, J. M., Lueptow, R. M., & Umbanhowar, P. B. (2020) Rising and sinking intruders in dense granular flows. *Physical Review Research*, 2(2), 022069.
2. Cui, K. F., Zhou, G. G. D., **Jing, L.**, Chen, X., & Song, D. (2020) Generalized friction and dilatancy laws for immersed granular flows containing large and small particles. *Physics of Fluids (In Press)*.
3. Zhou, G. G. D., Cui, K. F., **Jing, L.**, Zhao, T., Song, D., & Huang, Y. (2020) Particle size segregation in granular mass flows with different ambient fluids. *Journal of Geophysical Research: Solid Earth*, e2020JB019536.
4. Weinhart, T., Orefice, L., Post, M., Schroyen Lantman, M. P., Denissen, I. F. C., Tunuguntla, D. R., Tsang, J. M. F., Cheng, H., Shaheen, M. Y., Shi, H., Rapino, P., Grannonio, E., Losacco, N., Barbosa, J., **Jing, L.**, Alvarez Naranjo, J. E., Roy, S., Otter, W. K., & Thornton, A. R. (2020) Fast, flexible particle simulations - An introduction to MercuryDPM. *Computer Physics Communications*, 249, 107129.

5. Yang, G. C., **Jing, L.**, Kwok, C. Y., & Sobral, Y. D. (2020) Pore-scale simulation of immersed granular collapse: Implications to submarine landslides. *Journal of Geophysical Research: Earth Surface*, 125(1).
6. **Jing, L.**, Yang, G. C., Kwok, C. Y., & Sobral, Y. D. (2019) Flow regimes and dynamic similarity of immersed granular collapse: A CFD-DEM investigation. *Powder Technology*, 345, 532–543.
7. Yang, G. C., **Jing, L.**, Kwok, C. Y., & Sobral, Y. D. (2019) A comprehensive parametric study of LBM-DEM for immersed granular flows. *Computers and Geotechnics*, 114, 103100.
8. **Jing, L.**, Yang, G. C., Kwok, C. Y., & Sobral, Y. D. (2018) Dynamics and scaling laws of underwater granular collapse with varying aspect ratios. *Physical Review E*, 98, 042901.
9. **Jing, L.**, Kwok, C. Y., Leung, Y. F., Zhang, Z., & Dai, L. (2018) Runout scaling and deposit morphology of rapid mudflows. *Journal of Geophysical Research: Earth Surface*, 123(8), 2004–2023.
10. Duan, K., Kwok, C. Y., Wu, W., & **Jing, L.** (2018) DEM modeling of hydraulic fracturing in permeable rock: influence of viscosity, injection rate and in-situ states. *Acta Geotechnica*, 13(5), 1187–1202.
11. Meng, Y., Zhu, H. J., Kwok, C. Y., Kuo, M., **Jing, L.**, & Huang, X. (2018) Effect of coefficient of friction on arch network in shearing process under low confinement. *Powder Technology*, 335, 1–10.
12. van der Vaart, K., Thornton, A. R., Johnson, C. G., Weinhart, T., **Jing, L.**, Gajjar, P., Gray, J. M. N. T., & Ancey, C. (2018) Breaking size- segregation waves and mobility feedback in dense granular avalanches. *Granular Matter*, 20(3), 46.
13. **Jing, L.**, Kwok, C. Y., & Leung, Y. F. (2017) Micromechanical origin of particle size segregation. *Physical Review Letters*, 118, 118001.
14. **Jing, L.**, Kwok, C. Y., Leung, Y. F., & Sobral, Y. D. (2016) Characterization of base roughness for granular chute flows. *Physical Review E*, 94, 052901.
15. **Jing, L.**, Kwok, C. Y., Leung, Y. F., & Sobral, Y. D. (2016) Extended CFD–DEM for free-surface flow with multi-size granules. *International Journal for Numerical and Analytical Methods in Geomechanics*, 40(1), 62–79.

Conference Papers

1. Thornton, A. R., Post, M., Orefice, L., Rapino, P., Roy, S., Polman, H., Shaheen, M. Y., Alvarez Naranjo, J. E., Cheng, H. Y., **Jing, L.**, Shi, H., Mbaziira, J., Roepel, R., & Weinhart, T. (2020) Faster, more flexible particle simulations: The future of MercuryDPM. In *8th International Conference on Discrete Element Methods (DEM8)*. Jul 21–26, 2019, Enschede, The Netherlands.
2. Yang, G. C., **Jing, L.**, Kwok, C. Y., & Sobral, Y. D. (2019) A question of scaling in immersed granular collapses. In *Second International Conference on the Material Point Method (MPM2019)*. Jan 8–10, 2019, Cambridge, UK.
3. Yang, G. C., **Jing, L.**, Kwok, C. Y., & Sobral, Y. D. (2019) Simulation of pore pressure effects on granular flow dynamics. In *Second JTC1 Workshop on Triggering and Propagation of Rapid Flow-like Landslides*. Dec 3–5, 2018, Hong Kong, China.
4. **Jing, L.**, Yang, G. C., Kwok, C. Y., & Sobral, Y. D. (2018) Coupled fluid-particle modeling of submerged granular collapse. In *micro to MACRO mathematical modelling in soil mechanics*. May 29–31, 2018, Reggio Calabria, Italy.

5. Yang, G. C., **Jing, L.**, Kwok, C. Y., & Sobral, Y. D. (2018) Effects of dilation and contraction on immersed granular column collapse. In *micro to MACRO mathematical modelling in soil mechanics*. May 29–31, 2018, Reggio Calabria, Italy.
6. **Jing, L.**, Kwok, C. Y., Zhao, T. & Zhou J. (2018) Effect of particle size segregation in debris flow deposition. In *GeoShanghai International Conference 2018*. May 27–30, 2018, Shanghai, China.
7. **Jing, L.**, Kwok, C. Y., Leung, Y. F., & Sobral, Y. D. (2017). Effect of geometric base roughness on size segregation. In *EPJ Web of Conferences*: 140, 03056. Jul 3–7, 2017, Montpellier, France.
8. **Jing, L.**, Kwok, C. Y., Leung, Y. F., & Sobral, Y. D. (2017). Basal effect in mono- and bi-disperse chute flows. In *Proceedings of 7th International Conference on Discrete Element Methods (DEM7)*: 445–453. Aug 1–4, 2016, Dalian, China.
9. **Jing, L.**, Kwok, C. Y., Leung, Y. F., & Sobral, Y. D. (2015). Discrete element modelling of grain size segregation in bi-disperse granular flows down chute. In *PARTICLE-BASED METHODS IV Fundamentals and Applications*. Sep 27–30, 2015, Barcelona, Spain.
10. **Jing, L.**, Kwok, C. Y., & Leung, Y. F. (2014). A coupled CFD-DEM model for fluid-particle flows with free surface: Formulation and validation. In *Geomechanics from micro to macro (IS-Cambridge 2014)*: 485–490. Sep 1–4, 2014, Cambridge, UK.

PRESENTATIONS

Invited Talks

1. Discrete element method and its coupling with fluids. Department of Geotechnical Engineering, Tongji University, Jun 8 & 15, 2020, virtual.
2. Segregation, basal effect, and roles of ambient fluid in geophysical flows. Multi-Scale Mechanics Group, University of Twente, Apr 24, 2018, Enschede, The Netherlands.
3. Dynamics of particle-fluid systems from micro to macro. College of Water Resource and Hydropower, Sichuan University, Jun 12, 2017, Chengdu, China.
4. Continuum and discrete modeling of debris flow-related phenomena. Department of Geotechnical Engineering, Tongji University, Apr 25, 2017, Shanghai, China.

Conferences

1. Unifying gravity- and kinematics-induced segregation forces in dense granular flows. 73rd Annual Meeting of the APS Division of Fluid Dynamics, Nov 22–24, 2020, virtual.
2. A segregation force model for mixtures. AIChE Annual Meeting, Nov 15–20, 2020, virtual.
3. Predicting size and density segregation in granular flows. Blending & Segregation Forum (BSF2019), Aug 5–8, 2019, West Lafayette, USA.
4. Driving forces in size and density segregation. 2019 APS March Meeting, Mar 4–8, 2019, Boston, USA.
5. Feedback effect of base roughness on particle size segregation in bi-disperse granular avalanche. 2017

AGU Fall Meeting, Dec 11–15, 2017, New Orleans, USA.

6. Characterization of geometric base roughness in mono- and bi-disperse chute flows. Powders & Grains 2017, Jul 3–7, 2017, Montpellier, France.
7. Experimental and numerical study of depositional mechanism of mudflows. International Geotechnics Symposium *cum* International Meeting of CSRME 14th Biennial National Congress (IGS/IMCSRME), Dec 14–17, 2016, Hong Kong, China.
8. Basal effect in mono- and bi-disperse chute flows. 7th International Conference on Discrete Element Methods (DEM7), Aug 1–4, 2016, Dalian, China.
9. Characterization of base roughness for granular chute flows. Engineering Mechanics Institute Conference 2016 (EMI2016), May 23–25, 2016, Nashville, USA.
10. Grain size segregation in chute flows. IV International Conference on Particle-Based Methods (PARTICLES 2015), Sep 27–30, 2015, Barcelona, Spain.
11. Extended CFD-DEM for fluid-particle flows with free surface. International Symposium on Geomechanics from Micro to Macro (IS-Cambridge 2014), Sep 1–4, 2014, Cambridge, UK.

ACTIVITIES & SERVICE

Journal Reviewer (Selected)

Computers and Geotechnics · Journal of Geophysical Research: Earth Surface · Granular Matter · Powder Technology · Physics of Fluids · Journal of Fluid Mechanics (Assisted)

Professional Affiliations (2019-)

American Physics Society (APS) · American Institute of Chemical Engineers (AIChE)