

## Curriculum Vitae (CV), Ryunosuke KIDO

Data of Birth (d/m/y): 26/Nov/1991

Associate Professor

Graduate School of Advanced Science and Engineering, Hiroshima University  
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### Education

PhD in Engineering, Kyoto University, Kyoto, JPN

March 2019

*Dissertation title:* “Microscopic Characteristics of Partially Saturated Soil and their Link to Macroscopic Responses”

MA in Engineering, Kyoto University, Kyoto, JPN

March 2016

BA in Engineering, Kyoto University, Kyoto, JPN

March 2014

### Academic and Professional Experience

Associate Professor, Hiroshima University, JPN

April 2024 ~ Present

Assistant Professor, Kyoto University, JPN

April 2019 ~ March 2024

JSPS Research Fellowships for Young Scientists, JPN

April 2017 – March 2019

### Research Topics

Partially Saturated Soil / Pile Foundation / Reinforced Earth Wall / Stabilizing solution infiltration

### Publications

Latest update: April 2026

\* Corresponding author

- 1) **Kido, R.\***, Shigemoto, S. and Hata, T.: Improvement of sand re-liquefaction resistance by microbially induced calcite precipitation under cyclic undrained triaxial loading conditions, *Biogeotechnics*, No.100243, 2026. <https://doi.org/10.1016/j.bgtech.2026.100243>
- 2) Mugula, J., Nakayenga, J., Yu, Z., Bulolo, S., **Kido, R.**, Guharay, A. and Hata, T.: Sustainable bio-cementation of granite sand using cellulose–cellulase systems under controlled environmental conditions, *Sustainable Materials and Technologies*, No. e02003, 2026. <https://doi.org/10.1016/j.susmat.2026.e02003>
- 3) **Kido, R.\***, Ohtani, Y., Higo, Y.: Macroscale and microscale triaxial compressive behaviors of loose saturated sand under excess pore water pressure generation, *Soils and Foundations*, Vol.66, No.2, 101725, 2026. <https://doi.org/10.1016/j.sandf.2025.101725>
- 4) **Kido, R.\***, Higo, Y. and Eshiro, S.: Microscopic investigation into density dependence of water retention characteristics of sand during drying-wetting process, *Soils and Foundations*, Vol.65, No.6, 101704, 2025. <https://doi.org/10.1016/j.sandf.2025.101704>
- 5) Zhu, Y., Wei, Y., Fan, W., Chareyre, B., Wu, C. and **Kido, R.**: Numerical investigation on effects of particle size distribution on loess mechanics using DEM, *Environmental Earth Sciences*, Vol.84, No.618, 2025. <https://doi.org/10.1007/s12665-025-12642-1>

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- 6) **Kido, R.\*** and Ueda, H.: Infiltration characteristics of bentonite-based stabilizing fluid into pore spaces of sand investigated by X-ray micro CT analysis, *Acta Geotechnica*, 2025.
- 7) Mugula, J., Nakayenga, J., **Kido, R.**, GuhaRay, A and Hata, T.: Sustainable Stabilization of Sandy Soils Using Steel Slag and Biopolymer Cellulose, *Case Studies in Construction Materials*, Vol.22, No.e04555, 2025. <https://doi.org/10.1016/j.cscm.2025.e04555>
- 8) **Kido, R.\*** and Ueda, H.: Microscale investigation of bentonite distribution in pore spaces of sand after infiltration of stabilising solution, *Géotechnique Letters*, Vol.15, No.2, pp.110-115, 2025. <https://doi.org/10.1680/jgele.24.00053>
- 9) Dong, N.T., Lai, V.Q., Keawsawasvong, S., Nguyen, T.S. and **Kido, R.**: Uplift capacity analysis of inclined strip anchors considering spatial variability of undrained shear strength: RAFELA and ANN, *Computers and Geotechnics*, Vol.177, Part B, 106915, pp.1-23, 2025. <https://doi.org/10.1016/j.compgeo.2024.106915>
- 10) Higo, Y. and **Kido, R.**: A microscopic interpretation of hysteresis in the water retention curve of sand, *Géotechnique*, pp.1-9, 2023. <https://doi.org/10.1680/jgeot.23.00084>
- 11) Nakata, Y., Moriguchi, S., Kajiyama, S., **Kido, R.**, Kikkawa, N., Saomoto, H., Takano, D. and Higo, Y.: Experimental data of 3D printed granular material for verification of Discrete element modelling simulation, *Soils and Foundations*, Vol.62, No.4, 101178, 2022. <https://doi.org/10.1016/j.sandf.2022.101178>
- 12) **Kido, R.\***, Suezawa, R., Sawamura, Y. and Kimura, M.: Experimental investigation of bearing mechanism of closed- and open-ended piles supported by thin bearing layer using X-ray micro CT, *Soils and Foundations*, Vol.62, No.4, 101179, 2022. <https://doi.org/10.1016/j.sandf.2022.101179>
- 13) Song, C., Nakashima, S., **Kido, R.**, Yasuhara, H. and Kishida, K.: Short- and long-term observations of fracture permeability in granite by flow-through tests and a comparative observation by X-ray CT, *International Journal of Geomechanics*, Vol.21, No.9, 2021. [https://doi.org/10.1061/\(ASCE\)GM.1943-5622.0002114](https://doi.org/10.1061/(ASCE)GM.1943-5622.0002114)
- 14) **Kido, R.\***, Sawamura, Y., Kimura, K. and Kimura, M.: Investigation of soil deformation characteristics during pullout of a ribbed reinforcement using X-ray micro CT, *Soils and Foundations*, Vol.61, No.3, pp.642-657, 2021. <https://doi.org/10.1016/j.sandf.2021.01.013>
- 15) **Kido, R.\*** and Higo, Y.: Quantification of pore volume and degree of saturation in partially saturated sands with different bulk density, *Japanese Geotechnical Society Special Publication*, Vol.8, No.6, pp.216-220, 2020. <https://doi.org/10.3208/jgssp.v08.j19>
- 16) **Kido, R.** and Higo, Y.: Microscopic characteristics of partially saturated dense sand and their link to macroscopic responses under triaxial compression conditions, *Acta Geotechnica*, Vol.15, No.11, pp.3055-3073, 2020. <https://doi.org/10.1007/s11440-020-01049-w>
- 17) **Kido, R.**, Higo, Y., Takamura, F., Morishita, R., Khaddour, G. and Salager, S.: Morphological transitions for pore water and pore air during drying and wetting processes in partially saturated sand, *Acta Geotechnica*, Vol.15, No.7, pp.1745-1761, 2020. <https://doi.org/10.1007/s11440-020-00939-3>
- 18) **Kido, R.\*** and Higo, Y.: Distribution changes of grain contacts and menisci in shear band during triaxial compression test for unsaturated sand, *Japanese Geotechnical Society Special Publication*, Vol.7, No.2, pp.627-635, 2019. <https://doi.org/10.3208/jgssp.v07.096>
- 19) Higo, Y., **Kido, R.**, Takamura, F. and Fukushima, Y.: Pore-scale investigations of partially water-saturated granular soil, *Mechanics Research Communications*, Vol.94, pp.1-7, 2018. <https://doi.org/10.1016/j.mechrescom.2018.08.016>
- 20) **Kido, R.\*** and Higo, Y.: Evaluation of distribution of void ratio and degree of saturation in partially saturated triaxial

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sand specimen using micro x-ray tomography, Japanese Geotechnical Society Special Publication, Vol.5, No.2, pp.22-27, 2017. <https://doi.org/10.3208/jgssp.v05.006>

- 21) Higo, Y., Morishita, R., **Kido, R.**, Ghonwa, K. and Simon, S.: Local water-retention behavior of sand during drying and wetting process observed by micro x-ray tomography with trinarisation, Japanese Geotechnical Society Special Publication, Vol.2, No.16, pp.635-638, 2015. <https://doi.org/10.3208/jgssp.OTH-13>

### International Conference Proceedings (peer review)

Latest update: 10 August 2025)

- 1) **Kido, R.\*** and Higo, Y.: Variation in principal curvature of air-water interface inside and outside shear band of dense unsaturated sand, EUNSAT2-25, E3S Web of Conferences Vol.642, No.02002, pp. 1-6, 2025. <https://doi.org/10.1051/e3sconf/202564202002>
- 2) **Kido, R.\*** and Higo, Y.: Identification of morphological transition for pore water in partially saturated sand due to shear deformation, Proc. of the AP-UNSAT2024, Melborn, Australia, No.167, pp.346-352, 2024-11. [https://uploads.strikinglycdn.com/files/6e2ef90d-dd94-4e13-8782-7148bc30731d/The%208th%20Asia-Pacific%20Conference%20on%20Unsaturated%20Soils\\_Conference%20Proceedings.pdf](https://uploads.strikinglycdn.com/files/6e2ef90d-dd94-4e13-8782-7148bc30731d/The%208th%20Asia-Pacific%20Conference%20on%20Unsaturated%20Soils_Conference%20Proceedings.pdf)
- 3) Sawamura, Y., Kojima, T., **Kido, R.**, Shakuno, T., Nuruki, Y., Miyawaki, S., Horii, H., Nagai, H., Doi, M. and Fujii, N.: Relationship between water absorption and fiber properties of pulp used as ground improvement material, Lecture Notes in Civil Engineering, Proc. of the 5th International Conference on Transportation Geotechnics (ICTG2024), Vol.4, 2024. [https://doi.org/10.1007/978-981-97-8225-3\\_22](https://doi.org/10.1007/978-981-97-8225-3_22)
- 4) **Kido, R.\***, Nishimura, N., Mitsutani, S., Maruo, S. and Kimura, M.: Measurement of pressure distribution on roadbed using soil bags during plate loading test, Lecture Notes in Civil Engineering, Proc. of the 5th International Conference on Transportation Geotechnics (ICTG2024), Vol.8, pp.69-78, 2024. [https://doi.org/10.1007/978-981-97-8241-3\\_8](https://doi.org/10.1007/978-981-97-8241-3_8)
- 5) **Kido, R.\*** and Ueda, H.: Microscopic distribution of bentonite in pore spaces of sand after infiltration of stabilizing solution with different concentrations, IOP Conference Series: Earth and Environmental Science (IS-Grenoble2024), Vol.1480, No.012063, Grenoble, France, 2024. <https://iopscience.iop.org/article/10.1088/1755-1315/1480/1/012063>
- 6) **Kido, R.\*** and Ueda, H.: Pore-scale investigation on mud film formation during infiltration of bentonite slurry solution, 33rd ALERT Geomaterials Workshop, Aussois, France, Sep 25-27, pp.48-49, 2023.
- 7) **Kido, R.\*** and Higo, Y.: Progressive formation of concentrated seepage path in gap-graded sand due to suffusion and its influence on permeability change, Proceedings of the 17th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering (17ARC), Smart Geotechnics for Smart Societies, pp.348-351, 2023. <https://www.taylorfrancis.com/chapters/oa-edit/10.1201/9781003299127-34/progressive-formation-concentrated-seepage-path-gap-graded-sand-due-suffusion-influence-permeability-change-kido-higo>
- 8) Martinez, I.G., **Kido, R.**, Sawamura, Y. and Kimura, M.: Centrifuge model tests on the effects of the supporting dense sand layer thickness on a pile under static loading, 10th International Conference on Physical Modelling in Geotechnics, September 19-23, KAIST, Daejeon, Korea, 2022.
- 9) **Kido, R.\*** and Higo, Y.: Characterization of water retention states in partially saturated sand based on morphology of pore water and pore air using X-ray micro computed tomography, Proc. of 20th International Conference on Soil

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Mechanics and Geotechnical Engineering (ICSMGE 2021), 2022.

- 10) **Kido, R.\***, Higo, Y. and Fukushima, Y.: Microscopic observation of variation in pore volume and local degree of saturation in partially saturated sand under triaxial compression using voronoi tessellation, Proc. of the 9th Asian Young Geotechnical Engineers Conference (9AYGEC), pp.142-147, Lahore, Pakistan, 2019-12.
- 11) **Kido, R.\***, Higo, Y. and Takamura, F.: Investigation of volume distribution for pore water and pore air in partially saturated sand subjected to drying and wetting through morphological image processing, Proc. of the 16th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering, Taipei, Taiwan, 2019-10.
- 12) **Kido, R.\*** and Higo, Y.: Three-dimensional measurement of displacement field in sand specimens under triaxial compression, Proc. of the 7th China-Japan Geotechnical Symposium, pp.122-127, Sanya, China, 2018-3.
- 13) **Kido, R.\***, Higo, Y. and Salager, S.: Microscopic investigation of progressive changes of pore water distribution in shear band of unsaturated sand under triaxial compression, Proc. of the 19th International Conference on Soil Mechanics and Geotechnical Engineering, pp.1171-1174, Seoul, Republic of Korea, 2017-9.  
<https://www.issmge.org/uploads/publications/1/45/06-technical-committee-06-tc106-14.pdf>

### International Conference Proceedings (No peer-review)

Latest update: 10 August 2025)

- 1) Tamaoki, T. and Kido, R.: The effect of rib inclination angle of reinforcements on the pullout resistance evolution, The 10th International Conference on Discrete Element Method (DEM10), No. II-09, 2025.
- 2) Higo, Y., G, Khaddour., Salager, S., Morishita, R. and **Kido, R.**: Frequency mapping of local degree of saturation in partially saturated sand subjected to drying and wetting process, Proc. of the 2nd International Conference on Tomography of Materials and Structures, pp.627-631, Quebec, Canada, 2015-6.
- 3) **Kido, R.\*** and Higo, Y.: Relation between local porosity and degree of saturation of sand during drying and wetting process observed by micro x-ray tomography with trinarisation technique, Proc. of the 28th KKHTCNN Symposium on Civil Engineering, KU-GTE-02, Bangkok, Thailand, 2015-11.
- 4) Lai, V Q., Boonyatee, T., **Kido, R.**, Sawamura, Y. and Kimura, M.: A revisit to the interaction factor of group piles considering reinforce effect, Proc. of the 29th KKHTCNN Symposium on Civil Engineering, Track 3, Hong Kong, China, 2016-12.
- 5) **Kido, R.\*** and Higo, Y.: Microscopic observation of pore water distribution in strain localized region of partially saturated sand under triaxial compression, Proc. of the 29th KKHTCNN Symposium on Civil Engineering, Track 4, Hong Kong, China, 2016-12.
- 6) **Kido, R.\*** and Higo, Y.: Investigation of Water-Retention and Deformability for Partially Saturated Sand by Microfocus X-ray CT, 2nd JSCE CICHE Joint Workshop, No.10, Tokyo, Japan, 2017-5.
- 7) Higo, Y., Hamada, Y., Iwanaga, S., Hisaizumi, Y. and **Kido, R.**: Imaging fine soil particles transportation through soil skeleton caused by seepage flow, Proc. of the 3rd International Conference on Tomography of Materials and Structures, No.198, Lund, Sweden, 2017-6.
- 8) **Kido, R.\***, Higo, Y. and Takamura, F.: Image processing to quantify microscopic curvature of pore water in partially saturated soil, Proc. of the 3rd International Conference on Tomography of Materials and Structures, No.43, Lund, Sweden, 2017-6.
- 9) **Kido, R.\*** and Higo, Y.: Investigation of shear deformation behavior for fully and partially saturated sand by using digital image correlation, Proc. of the 30th KKHTCNN Symposium on Civil Engineering, Geotech III, Taipei,

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Taiwan, 2017-11.

- 10) Sawamura, Y., Kimura, K., **Kido, R.** and Kimura, M.: MicroX-ray visualization of pullout behavior of reinforcement material under triaxial confining stress conditions, IS-Atlanta2018, Pores-X-ray CT, Atlanta, USA, 2018-9.
- 11) Higo, Y., **Kido, R.** and Fukushima, Y.: Microscopic investigation on morphological evolution of pore water in partially saturated sands during triaxial compression, IS-Atlanta2018, Unsat Soil, Atlanta, USA, 2018-9.
- 12) Kimura, K., Sawamura, Y., **Kido, R.** and Kimura, M.: Visualization of Pull-out Behavior of Reinforcement Material under Various Triaxial Stress Conditions by X-ray CT and Image Correlation, Proc. of the 31th KKHTCNN Symposium on Civil Engineering, KU-15, Kyoto, Japan, 2018-11.
- 13) Fukushima, Y., **Kido, R.** and Higo, Y.: Investigation of microscopic behavior in partially saturated sand during triaxial compression test under different drainage conditions, Proc. of the 31th KKHTCNN Symposium on Civil Engineering, KU-28, Kyoto, Japan, 2018-11.
- 14) **Kido, R.\*** and Higo, Y.: Relationship between pore volume and degree of saturation in partially saturated sand using Voronoi tessellation, Proc. of the 31th KKHTCNN Symposium on Civil Engineering, KU-16, Kyoto, Japan, 2018-11.
- 15) **Kido, R.\***, and Higo, Y.: X-ray image processing to investigate variation in water retention state of partially saturated sand during triaxial compression tests, Proc. of the International Conference on Tomography of Materials and Structures 2019, Cairns, Australia, 2019-7.
- 16) **Kido, R.\*** and Higo, Y.: Change in curvature of pore water in partially saturated sand and its influence on deviator stress under triaxial compression, Proc. of 25th International Congress of Theoretical and Applied Mechanics (ICTAM), Milano, August 22-27, 2021.
- 17) Uehira, K., **Kido, R.** and Higo, Y.: Change in coordination number of pore water in unsaturated sand under triaxial compression, Proc. of the 33rd KKHTCNN Symposium on Civil Engineering, Singapore, Nov 17-19, 2022.
- 18) Ohtani, Y., **Kido, R.** and Higo, Y.: Visualization of fabric tensor of very loose saturated sand under undrained triaxial compression, Proc. of the 33rd KKHTCNN Symposium on Civil Engineering, Singapore, Nov 17-19, 2022.
- 19) Toda, K., **Kido, R.**, Higo, Y., Hoshino, M. and Uesugi, K.: Full-Field Measurement of Vertical Distribution of Void Ratio and Degree of Saturation in Partially Saturated Triaxial Specimens, Proc. of the 34th KKHTCNN Symposium on Civil Engineering, Pattaya, Thailand, Nov 23-24, 2023.
- 20) Zabrodin, M., **Kido, R.**, Ali, U., Shahzad, Q. and Kikumoto, M.: Tensile Force Development on Soil Bag Models Investigated by DEM, Proc. of the 34th KKHTCNN Symposium on Civil Engineering, Pattaya, Thailand, Nov 23-24, 2023.
- 21) Kojima, T., **Kido, R.**, Shakuno, T., Nuruki, Y., Horii, H., Nagai, H., Doi, M. and Sawamura, Y.: Experimental Study on Physical Properties of Pulp Fibers for Treatment of High Water-Content Mud, Proc. of the 34th KKHTCNN Symposium on Civil Engineering, Pattaya, Thailand, Nov 23-24, 2023.
- 22) Birhanu, T., **Kido, R.** and Sawamura, Y.: Evaluation of the Performance of Road-Cross Section Constructed with Stabilized Soft Soil using Finite Element Analysis, Proc. of the 34th KKHTCNN Symposium on Civil Engineering, Pattaya, Thailand, Nov 23-24, 2023.
- 23) Mutungi, W. N., Martinez, I.G., **Kido, R.** and Sawamura, Y.: Numerical Simulation of Excess Pore Water Pressure Generation on a Single Pile Supported by a Thin Bearing Layer, Proc. of the 34th KKHTCNN Symposium on Civil Engineering, Pattaya, Thailand, Nov 23-24, 2023.

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- 24) **Kido, R.** and Higo, Y.: Link between microscopic characteristics and macroscopic responses of partially saturated sand under triaxial compression, IWACOM-IV, No.OW8-14, 2024.
- 25) Kido, R., Hamano, C., Chareyre, B. and Higo, Y.: Shear behavior of unsaturated granular media in the pendular saturation regime under drained and undrained conditions, 10th International Conference on Discrete Element Methods (DEM10), 2025.