

TAESSEO KU

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I. EDUCATIONAL QUALIFICATIONS

Georgia Institute of Technology

Dec. 2012

PhD: Geosystems Engineering, School of Civil and Environmental Engineering

Dissertation: *'Geostatic Stress State Evaluation by Directional Shear Wave Velocities, with Application towards GeoCharacterization at Aiken, South Carolina'* (Advisor – Professor Paul W. Mayne)

University of California-Berkeley

May 2008

Master of Science: Geo-Engineering Program, Department of Civil and Environmental Engineering

Yonsei University

Feb. 2004

Bachelor of Science: School of Civil and Environmental Engineering

II. CAREER HISTORY

- Associate Professor, Konkuk University (2022.03 – present)
- Assistant Professor, National University of Singapore (2013.08 – 2022.02)
- Senior Researcher, Korea Railroad Research Institute (2013.04-2013.07)
- Postdoctoral Researcher, Georgia Institute of Technology (2012.12-2013.03)
- Research Assistant, Georgia Institute of Technology (2009-2012)
- Researcher, Korea Institute of Construction Technology (2008.09-2008.12)
- Civil Engineer, Samsung Engineering & Construction (2004-2005)

III. RESEARCH INTERESTS

- **Advanced Geotechnical & Geophysical Site Characterization/Monitoring**
- **Geohazard & Georisk Assessment and Mitigation**
- **Data-driven Geo-Characterization/Subsurface Exploration** (Machine Learning, Bayesian Network)
- Geophysical Aspects of Smart Cities
- Seismic Wave-based Geo-Characterization & Non-destructive Monitoring
- Near Surface Geophysics & Emerging Seismic Methods
- **Sustainable Ground Improvement – Cement-stabilized Soil/Geomaterials**
- **Innovative Use of Eco-friendly Cementitious Binders**
- Underground Construction in Urban Environments

IV. PROFESSIONAL CONTRIBUTIONS

HONORS/AWARDS (International)

- Canadian Geotechnical Journal – Editor's Choice 2013 (April)
- Best Poster Award – GeoShanghai International Conference 2018, China

- Outstanding Reviewer Recognition (awarded 2017) – Engineering Geology
- Outstanding Reviewer Recognition (awarded 2017) – Soil Dynamics and Earthquake Engineering
- Outstanding Reviewer Recognition (awarded 2018) – Computers and Geotechnics
- Outstanding Reviewer Recognition (awarded 2017) – Cement and Concrete Research
- Advisor, Daniel Loh awarded first place in ISSMGE TC304/TC309 Student Contest in conjunction with APSSRA2020: <https://www.eng.nus.edu.sg/cee/news/loh-ren-de-daniel-issmge-tc304-tc309-student-contest/>
- NUS Contribution Award (Service, 2019)
- Ajou University Global Fellow

HONORS/AWARDS (Domestic)

- Best Paper Presentation Award (advisor) – Korean Geotechnical Society, Fall National Conference 2024
- Excellence Award (advisor) – KSCE 2024 CONVENTION Capstone Design Competition
- Best Paper Presentation Award – Korean Geosynthetics Society, Fall National Conference 2023
- Yonsei University Scholarship

INSTITUTIONAL & PROFESSIONAL SERVICE (International)

- Nominated Member, TC 101 (Laboratory Stress Strength Testing of Geomaterials), International Society for Soil Mechanics & Geotechnical Engineering (ISSMGE) [2015-2022]
- Nominated Member, TC 102 (Ground Property Characterization from In-Situ Tests), International Society for Soil Mechanics & Geotechnical Engineering (ISSMGE) [2015-2022]
- Corresponding Member, TC101, TC102, TC 307 (Sustainability), International Society for Soil Mechanics & Geotechnical Engineering (ISSMGE) [since 2024]
- Committee, ASTM D18 on Soil and Rock
- Member, American Society of Civil Engineers (ASCE) [2015-2022]
- Member, ASTM International [2014-2021]
- Member, Society of Exploration Geophysicists (SEG) [2018-2021]
- Member, International Geosynthetics Society [2025-]
- Member, Geotechnical Society of Singapore (GeoSS)

INSTITUTIONAL & PROFESSIONAL SERVICE (Domestic)

- 한국지반공학회 기술인증위원회 특임이사 (2025-현재)
- 한국지반공학회 학회지 편집위원회 부위원장 (2023-2024)
- 한국신소재학회 교육(보강토)전담이사 (2025-현재)
- 국토교통부 중앙건설기술심의위원회 위원 (2024-2025)
- 서울시 지반침하 신기술 공모 선정심사위원회 위원 (2025)
- 한국토목학회 학회지편집위원회 (2023)
- 한국토목학회 토목구조물 모형 경진대회 심사위원 (2024)
- 건국대학교 사회환경공학부 공학인증프로그램 PD (2023-현재)
- Member, Korean Geotechnical Society; Korean Society of Civil Engineers; Korean Geosynthetics Society

EDITORIAL SERVICE (International)

- Associate Editor, ASCE Journal of Materials in Civil Engineering (JAN. 2020 ~)
- Associate Editor, KSCE Journal of Civil Engineering (JAN. 2019 ~)
- Associate Editor, International Journal of Geo-Engineering (July. 2023 ~)
- Co-Editor, Proceeding - Advances in Soft Ground Engineering (ICSGE2015)

- Co-Editor, Proceeding - Case Histories & Soil Properties (ICCS2019)

CONFERENCE PROGRAM COMMITTEE (International)

- Organizing Committee (Finance Committee Chair), 7th International Symposium on Transportation Soil Engineering in Cold Regions (TRANSOILCOLD 2025), Korean Geotechnical Society, Incheon, Korea
- Technical Committee, 3rd Geophysical Aspect of Smart Cities Workshop, Society of Exploration Geophysicists (SEG) / European Associate of Geoscientists and Engineers (EAGE) joint workshop (03-05 DEC 2024), Seoul, Korea
- Scientific Committee, 7th International Conference on Geotechnical and Geophysical Site Characterization (ISC'7-2024), ISSMGE- TC102 (In-Situ Testing), Barcelona, Spain
- Scientific Committee, 8th International Symposium on Deformation Characteristics of Geomaterials (IS-Porto 2023), ISSMGE- TC101 (Lab Testing), Porto, Portugal
- Scientific Committee, 7th International Symposium on Deformation Characteristics of Geomaterials (IS-Glasgow 2019), ISSMGE- TC101 (Lab Testing), Glasgow, UK
- Organizing Committee (Technical Chair), International Conference on Case Histories & Soil Properties (ICCS 2019), Geotechnical Society of Singapore (GeoSS), Singapore
- Technical Committee, 1st Geophysical Aspect of Smart Cities Workshop, Society of Exploration Geophysicists (SEG) / European Associate of Geoscientists and Engineers (EAGE) joint workshop (10-12 DEC 2019), Singapore
- Best Poster Selection Committee, GeoShanghai International Conference 2018, four host organizers including Chinese Institute of Soil Mechanics & Geotechnical Engineering, Shanghai, China
- International Technical Committee, 5th International Conference on Geotechnical and Geophysical Site Characterization (ISC'5-2016), ISSMGE- TC102 (In-Situ Testing), Gold Coast, Australia
- Editorial Committee, 6th International Symposium on Deformation Characteristics of Soils, IS-Buenos Aires 2015, ISSMGE- TC101 (Lab Testing), Buenos Aires, Argentina
- Organizing Committee (Technical Chair), International Conference on Soft Ground Engineering (ICSGE 2015), Geotechnical Society of Singapore (GeoSS), Singapore
- Organizing Committee, Underground Singapore 2016, Tunnelling and Underground Construction Society (TUCS), Singapore
- Organizing Committee, Underground Singapore 2014, Tunnelling and Underground Construction Society (TUCS), Singapore

CONFERENCE SESSION CHAIRING (International)

- Session Chair, 'Site Characterization and Ground Improvement', The 2024 International Conference on Geomechanics and Engineering (ICGE2024), ACEM24, Seoul, Korea [Year – 2024]
- Session Chair, 'Theme Lecture' & 'Session – Slope, Equipment/Instrument', 3rd Asian Conference on Physical Modelling in Geotechnics (Asiafuge 2021), Geotechnical Society of Singapore (GeoSS) & ISSMGE TC104, Singapore [Year – 2021]
- Session Chair, 'Fiber-based Distributed Acoustic Sensing II', Society of Exploration Geophysicists (SEG) / European Associate of Geoscientists and Engineers (EAGE): Geophysical Aspect of Smart Cities Workshop, Singapore [Year – 2019]
- Session Chair, 'Session – Other Topics', International Conference on Case Histories & Soil Properties (ICCS2019), Geotechnical Society of Singapore (GeoSS), Singapore [Year – 2019]
- Session Chair, 'Solid Earth Sciences - Geotechnical and Geophysical Site Characterization', AOGS 16th Annual Meeting (AOGS2019), Asia Oceania Geosciences Society, Singapore [Year – 2019]
- Session Chair, 'GSP6- Soil Dynamics and Earthquake Engineering-1', GeoShanghai International Conference 2018, Shanghai, China [Year – 2018]
- Session Chair, 'Geotechnical Aspects of Dykes and Levees and Shore Protection', 19th International Conference on Soil Mechanics and Geotechnical Engineering (ICSMGE 2017), Seoul, Korea [Year – 2017]

- Session Chair, 'Liquefaction', The 6th Young Geotechnical Engineers' Conference, iYGEC6, Seoul, Korea [Year – 2017]
- Session Chair, 'Foundations', The 6th Young Geotechnical Engineers' Conference, iYGEC6, Seoul, Korea [Year – 2017]
- Session Chair, 'Ground Improvement', International Conference on Soft Ground Engineering (ICSGE 2015), Geotechnical Society of Singapore (GeoSS), Singapore [Year – 2015]
- Session Chair, 'Geotechnical Engineering IX', 31st KKHTCNN Symposium on Civil Engineering, Kyoto University, [Year – 2018]
- Session Chair, 'Session 21 - Geotech VII', 30th KKHTCNN Symposium on Civil Engineering, National Taiwan University, [Year – 2017]
- Session Chair, 'Civil Engineering (CS-4)', 26th KKHTCNN Symposium on Civil Engineering, National University of Singapore, [Year – 2013]

OTHER PROFESSIONAL ACTIVITIES (International)

- Reviewer (Journals) – Canadian Geotechnical Journal :: Journal of Geotechnical and Geoenvironmental Engineering, ASCE :: Géotechnique :: Géotechnique letter :: Journal of Materials in Civil Engineering, ASCE :: Engineering Geology :: Computers and Geotechnics :: Geotechnical Testing Journal, ASTM :: Soil Dynamics and Earthquake Engineering :: Soils and Foundations :: Acta Geotechnica :: ICE - Ground Improvement :: Journal of Geotechnical and Geological Engineering :: Geomechanics and Geoenvironmental Engineering :: Geomechanics and Engineering :: Journal of Earthquake and Tsunami :: SEAGS-AGSSEA Journal :: Geophysics, SEG :: Journal of Applied Geophysics :: Near Surface Geophysics, EAGE :: Applied Physics Letters (APL) :: Applied Sciences :: Cement and Concrete Research :: Construction and Building Materials :: Ocean Engineering :: Journal of Hydrologic Engineering :: Energies :: Sensors :: Smart Structures and Systems :: Greenhouse Gases- Science and Technology :: Journal of Testing and Evaluation, ASTM :: Journal of GeoEngineering :: KSCE Journal of Civil Engineering :: Transportation Geotechnics :: Innovative Infrastructure Solutions
- Reviewer, 1st Geotech Asia 2025, Goa, India
- Reviewer, 8th International Symposium on Deformation Characteristics of Geomaterials (IS-Porto 2023)
- Reviewer, 16th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering (16ARC)
- Reviewer, Society of Exploration Geophysicists (SEG) 91st Annual Meeting (2021)
- Reviewer, 5th International Conference on Geotechnical and Geophysical Site Characterization (ISC'5)
- Reviewer, 8th International Conference on Maintenance and Rehabilitation of Pavement (MAIREPAV8)
- Reviewer, The Annual International Offshore and Polar Engineering Conference (ISOPE-2020)
- Reviewer, The Annual International Offshore and Polar Engineering Conference (ISOPE-2017)
- Reviewer, The Annual International Offshore and Polar Engineering Conference (ISOPE-2015)
- Reviewer, ASCE GeoCongress 2012
- Research Proposal Reviewer – Singapore Ministry of Education (MOE); The National Research Foundation Singapore and the National Natural Science Foundation of China (NRF-NSFC) Joint Grant Call in Earth Science
- Examination Committee/Invigilator, The Fundamentals of Engineering Examination (Aug. 2020) – Professional Engineers Board Singapore
- Technical Expert/Assessor (Lab Accreditation/ Inspection Body Accreditation) by Singapore Accreditation Council (2015-2017)
- Assessor, Georgia Tech Research and Innovation Conference (GTRIC 2013)

V. PUBLICATIONS

JOURNAL PUBLICATIONS [Note: **name*** - corresponding author]

- (1) Gwak, D. and **Ku, T.*** (2025). "Data-driven machine learning approach for stress history evaluation in cohesive soils using cone penetration test data." *Engineering Geology*, Volume 355, 108246, <https://doi.org/10.1016/j.enggeo.2025.108246>
- (2) **Ku, T.*** and Subramanian, S. (2025). "Unified strength prediction model for cemented soils." *Geomechanics and Engineering*, Vol. 41, No. 1, 141–150, <https://doi.org/10.12989/gae.2025.41.1.141>
- (3) Wong, D.Y.-C., Ng, Y.C.H., Hong, Y., **Ku, T.**, Goh, S.H., and Lee, F.-H. (2025). "Detection and stiffness measurement of weak zones in cement-treated ground using travel-time tomography." *Canadian Geotechnical Journal*, Vol. 62, 1–17, <https://doi.org/10.1139/cgj-2024-0267>
- (4) Sagidullina, N., Kim, J., Satyanaga, A., **Ku, T.**, and Moon, S.W. (2024). "Mechanical and microstructural investigations on cement-treated expansive organic subgrade soil." *Geomechanics and Engineering*, Vol. 38, 353–366, <https://doi.org/10.12989/gae.2024.38.4.353>
- (5) Wei, X., **Ku, T.***, Yang, Z. and Liang, X. (2024). "Interactive influence of water and fines contents on the strength of compacted cement-stabilized clayey sands: Insights and predictive framework." *Journal of Materials in Civil Engineering*, ASCE, Vol. 36, No. 8, <https://doi.org/10.1061/JMCEE7.MTENG-17395>
- (6) Khan, Q. and **Ku, T.*** (2024). "Yielding evaluation of cement-treated soft clay under isotropic and anisotropic stress states using continuous G_{max} measurements." *Acta Geotechnica*, Vol. 19, No. 7, 4255–4276, <https://doi.org/10.1007/s11440-023-02129-3>
- (7) Hu, Y., Wang, Z.Z., **Guo, X.***, Kek, H.Y., **Ku, T.**, Goh, S.H., Leung, C.F., Tan, E. and Zhang, Y. (2024). "Three-dimensional reconstruction of subsurface stratigraphy using machine learning with neighborhood aggregation." *Engineering Geology*, Vol. 337, 107588, <https://doi.org/10.1016/j.enggeo.2024.107588>
- (8) Nawaz, M.N., Lee, S.-H., **Chong, S.-H.***, and **Ku, T.** (2024). "Interface frictional anisotropy of dilative sand." *Scientific Reports*, Vol. 14, No. 1, 6166. <https://doi.org/10.1038/s41598-024-56621-1>
- (9) Subramanian, S. and **Ku, T.*** (2023). "A framework to investigate the effect of sand on strength of cement-admixed clay." *Journal of Materials in Civil Engineering*, ASCE, Vol. 35, No. 7, <https://doi.org/10.1061/JMCEE7.MTENG-144>.
- (10) Wong, D.Y.C., **Ng, Y.C.H.***, Li, J., **Ku, T.**, Goh, S.H., and Lee, F.H. (2023). "Wave reflection effects on bender element test of very stiff clay." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, Vol. 149, No. 9, <https://doi.org/10.1061/JGGEFK.GTENG-11514>
- (11) Zhang, Y., Wei, X., Li, Y., Jeong, S. and **Ku, T.*** (2023). "Sediment thickness and average V_s prediction using HVSR of ambient seismic noise: case studies in Singapore." *Bulletin of Engineering Geology and the Environment*, Vol. 82, No. 5, <https://doi.org/10.1007/s10064-023-03195-3>.
- (12) Wang, Z.Z., Hu, Y., Guo, X., He, X., Kek, H.Y., **Ku, T.***, Goh, S.H., and Leung C.F. (2023). "Predicting geological interfaces using stacking ensemble learning with multi-scale features." *Canadian Geotechnical Journal*, <https://doi.org/10.1139/cgj-2022-0365>.
- (13) Yan, G., **Zhang, F.***, **Ku, T.***, Hao, Q., and Peng, J. (2023). "Experimental study and mechanism analysis on the effects of biaxial in-situ stress on hard rock blasting." *Rock Mechanics and Rock Engineering*, <https://doi.org/10.1007/s00603-022-03205-y>.
- (14) Liu, Y., Ng, Y.C.H., Zhang, Y., Yang, P., and **Ku, T.*** (2023). "Incorporating geotechnical and geophysical investigations for underground obstruction detection: A case study." *Underground Space*, Vol. 11, 116–129, <https://doi.org/10.1016/j.undsp.2022.12.003>.

- (15) Lo, M.K., Loh, D.R.D., Chian, S.C., and **Ku, T.*** (2023). "Probabilistic prediction of consolidation settlement and pore water pressure using variational autoencoder neural network." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, Vol. 149, No. 1, [10.1061/JGGEFK.GTENG-10555](https://doi.org/10.1061/JGGEFK.GTENG-10555).
- (16) Subramanian, S., Tee, W.Z., Moon, J., and **Ku, T.*** (2022). "Sustainable use of OPC-CSA blend for artificial cementation of sand: A dosage optimization study." *Geomechanics and Engineering*, Vol. 31, No. 4, <https://doi.org/10.12989/gae.2022.31.4.409>
- (17) Yan, G., Zhang, F.*, **Ku, T.**, and Hao, Q. (2022). "Experimental study on failure mechanism and geometric parameters of blasting crater under uniaxial static compressive stresses." *Bulletin of Engineering Geology and the Environment*, Vol. 81, No. 6, <https://doi.org/10.1007/s10064-022-02714-y>
- (18) Ng, Y.C.H.*, Kek, H.Y., Hu, X., Wong, L.N., Teo, S., **Ku, T.** and Lee, F.H. (2022). "An approach for characterising electrical conductivity of cement-admixed clays." *Soils and Foundations*, Vol. 62, No. 2, <https://doi.org/10.1016/j.sandf.2022.101127>
- (19) Wei, X., Liu, H., Choo, H., and **Ku, T.*** (2022). "Correlating failure strength with wave velocities for cemented sands from the particle-level analysis." *Soil Dynamics and Earthquake Engineering*, Vol. 152, 107062, <https://doi.org/10.1016/j.soildyn.2021.107062>.
- (20) Zhang, Y., Li, Y., and **Ku, T.*** (2021). "Soil/rock interface profiling using a new passive seismic survey: Autocorrelation seismic interferometry." *Tunnelling and Underground Space Technology*, Vol. 115, 104045, <https://doi.org/10.1016/j.tust.2021.104045>.
- (21) Abdialim, S., Hakimov, F., Kim, J., **Ku, T.**, and Moon, S.W.* (2021). "Seismic site classification from HVSr data using the Rayleigh wave ellipticity inversion: A case study in Singapore." *Earthquakes and Structures*, Vol. 21, No. 3, 231-238, <https://doi.org/10.12989/eas.2021.21.3.231>
- (22) Lo, M.K., Wei, X., Chian, S.C., and **Ku, T.*** (2021). "Bayesian network prediction of stiffness and shear strength of sand." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, Vol. 147, No. 5, [10.1061/\(ASCE\)GT.1943-5606.0002505](https://doi.org/10.1061/(ASCE)GT.1943-5606.0002505).
- (23) Wei, X., Liu, H., and **Ku, T.*** (2021). "Effects of plastic fines content on the engineering properties of cement-stabilized sands." *Granular Matter*, Vol. 23, 46, <https://doi.org/10.1007/s10035-021-01114-5>.
- (24) Lo, M.K., Leung, A.Y.F.*, and **Ku, T.** (2021). "Variability response function approach for foundation reliability." *Probabilistic Engineering Mechanics*, Vol. 64, 103129, <https://doi.org/10.1016/j.probengmech.2021.103129>.
- (25) Jumassultan, A., Sagidullina, N., Kim, J., **Ku, T.**, and Moon, S.W.* (2021). "Performance of cement-stabilized sand subjected to freeze-thaw cycles." *Geomechanics and Engineering*, Vol. 25, No. 1, [http://dx.doi.org/10.12989/gae.2021.25.1.041](https://doi.org/10.12989/gae.2021.25.1.041).
- (26) Liu, Y., Zhang Y., Nilot, E., Ng, T.C.H., Yang, P., and **Ku, T.*** (2021). "Detection of a shallow-buried rock obstruction using 2D full waveform inversion." *Soil Dynamics and Earthquake Engineering*, Vol. 143, 106644, <https://doi.org/10.1016/j.soildyn.2021.106644>.
- (27) **Ku, T.***, Subramaniam, P., Zhang, Y., Moon, S.W., Wei, X., Huang, E.S., Kumarasamy, J., and Goh, K.H. (2021). "Practical configured Microtremor Array Measurements (MAM) for geological investigation of underground space." *Underground Space* (Invited paper for a special issue titled "Digital Geology and Machine Learning in Tunneling"), Vol. 6, No. 3, 240-251, <https://doi.org/10.1016/j.undsp.2020.01.004>.
- (28) Wei, X., Liu, H., and **Ku, T.*** (2020). "Microscale analysis to characterize effects of water content on the strength of cement stabilized sand-clay mixtures." *Acta Geotechnica*, Vol. 15, No. 10, 2905-2923, [http://dx.doi.org/10.1007/s11440-020-01018-3](https://doi.org/10.1007/s11440-020-01018-3).
- (29) Subramanian, S., Khan, Q., and **Ku, T.*** (2020). "Effect of sand on the stiffness characteristics of cement-stabilized clay." *Construction and Building Materials*, Vol. 264, <https://doi.org/10.1016/j.conbuildmat.2020.120192>.
- (30) Zhang, Y., Li, Y., and **Ku, T.*** (2020). "A modified seismic reflection approach for engineering geology investigation in fractured rock zones." *Engineering Geology*, Vol. 270, <https://doi.org/10.1016/j.enggeo.2020.105592>.
- (31) Moon, S.W., Kim, R.E., Cheng, C.C., Li, Y., and **Ku, T.*** (2020). "Post-processing of background

- noise from SCPT auto source signal: A feasibility study for soil type classification." *Measurement*, Vol. 156, <https://doi.org/10.1016/j.measurement.2020.107610>
- (32) Subramanian, S., Zhang, Y., Vinoth, G., Moon, J., and **Ku, T.*** (2020). "Hydraulic conductivity of cemented sand from experiments and 3D image based numerical analysis." *Geomechanics and Engineering*, Vol. 21, No. 5, 423-432, <http://dx.doi.org/10.12989/gae.2020.21.5.423>.
 - (33) Shaldykova, A., **Moon, S.W.***, Kim, J., Lee, D., **Ku, T.**, and Zhussupbekov, A. (2020). "Comparative analysis of Kazakhstani and European approaches for the design of shallow foundations." *Applied Sciences*, Vol.10, No.8, 2920; <https://doi.org/10.3390/app10082920>.
 - (34) Liu, Y., **Yang, P.***, **Ku, T.**, and Gao, S. (2020). "Effect of different nanoparticles on the grouting performance of cement-based grouts in dynamic water condition." *Construction and Building Materials*, Vol. 248, <https://doi.org/10.1016/j.conbuildmat.2020.118663>.
 - (35) Khan, Q., Moon, S.W., and **Ku, T.*** (2020). "Idealized sine wave approach to determine arrival times of shear wave signals using bender elements." *Geotechnical Testing Journal*, ASTM, Vol. 43, No. 1, 171-193, <https://doi.org/10.1520/GTJ20170121>
 - (36) **Moon, S.W.***, Zhanar, B., Khan, Q., and **Ku, T.** (2020). Discussion of "Dynamic Characterization of Sand Stabilized with Cement and RHA and Reinforced with Polypropylene Fiber", by Ali Ghorbani and Maysam Salimzadehshooiili, *Journal of Materials in Civil Engineering*, ASCE, Vol. 32, No. 8. [https://doi.org/10.1061/\(ASCE\)MT.1943-5533.0003291](https://doi.org/10.1061/(ASCE)MT.1943-5533.0003291).
 - (37) Moon, S.W., Vinoth, G., Subramanian, S., Kim, J., and **Ku, T.*** (2020). "Effect of fine particles on strength and stiffness of cement treated sand." *Granular Matter*, Vol. 22, 9, <https://doi.org/10.1007/s10035-019-0975-6>.
 - (38) Subramaniam, P., Zhang, Y., Ng, Y.C.H., and **Ku, T.*** (2020). "Modal Analysis of Rayleigh Waves using Classical MASW-MAM Approach: Site Investigation in a Reclaimed Land." *Soil Dynamics and Earthquake Engineering*, Vol. 128, 105902, <https://doi.org/10.1016/j.soildyn.2019.105902>.
 - (39) **Moon, S.W.***, Zhanar, B., Khan, Q., and **Ku, T.** (2020). Discussion on "Shear wave velocity of zeolite-cement grouted sands", by Afshin Kordnaeij, Reza Ziaie Moayed and Majid Soleimanib [Soil Dyn Earthq Eng 122 (2019) 196–210]. *Soil Dynamics and Earthquake Engineering*, Vol. 128, 105845, <https://doi.org/10.1016/j.soildyn.2019.105845>.
 - (40) Wei, X. and **Ku, T.*** (2020). "New design chart for geotechnical ground improvement: characterizing cement stabilized sand." *Acta Geotechnica*, Vol. 15, No. 4, 999-1011, [10.1007/s11440-019-00838-2](https://doi.org/10.1007/s11440-019-00838-2).
 - (41) Moon, S.W., Subramaniam, P., Zhang, Y., Vinoth, G., and **Ku, T.*** (2019). "Bedrock depth evaluation using microtremor measurement: empirical guidelines at weathered granite formation in Singapore." *Journal of Applied Geophysics*, Vol. 171, <https://doi.org/10.1016/j.jappgeo.2019.103866>.
 - (42) Lee, C., Nam, H., Lee, W., **Choo, H.***, and **Ku, T.** (2019). "Estimating UCS of cement-grouted sand using characteristics of sand and UCS of pure grout." *Geomechanics and Engineering*, Vol. 19, No. 4, 343-352, <https://doi.org/10.12989/gae.2019.19.4.343>.
 - (43) Zhang, Y., Li, Y., and **Ku, T.*** (2019). "Geotechnical site investigation for tunneling and underground works by advanced passive surface wave survey." *Tunnelling and Underground Space Technology*, Vol. 90, 319-329, <https://doi.org/10.1016/j.tust.2019.05.003>.
 - (44) Subramaniam, P., Banerjee, S., and **Ku, T.*** (2019). "Shear modulus and damping ratio model for cement treated clay." *International Journal of Geomechanics*, ASCE, Vol. 19, No. 7, [10.1061/\(ASCE\)GM.1943-5622.0001448](https://doi.org/10.1061/(ASCE)GM.1943-5622.0001448).
 - (45) Zhang, Y., Li, Y.E., Zhang, H. and **Ku, T.*** (2019). "Near-surface site investigation by seismic interferometry using urban traffic noise in Singapore." *Geophysics*, SEG, Vol. 84, No. 2, P. B169-B180, [10.1190/GEO2017-0798.1](https://doi.org/10.1190/GEO2017-0798.1).
 - (46) Subramanian, S., Khan, Q., and **Ku, T.*** (2019). "Strength development and prediction of calcium sulfoaluminate treated sand with optimized gypsum for replacing OPC in ground improvement." *Construction and Building Materials*, Vol. 202, 308-318. <https://doi.org/10.1016/j.conbuildmat.2018.12.121>
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CONFERENCE PROCEEDINGS (International)

- (1) Gwak, D. and Ku, T. (2024). "Data-driven stress history evaluation of cohesive soils using machine learning with CPT data." *Proceedings of 2nd Workshop on Future of Machine Learning in Geotechnics and 5th Machine Learning Geotechnics Dialogue (2FOMLIG & 5MLIGD)*, 2p
- (2) Abdialim, S., Paizy, N., Kim, J., Satyanaga, A., Ku, T. and Moon, S.W. (2024). "Evaluation of the dynamic soil characteristics of loam soils from MASW in Kazakhstan." *Proceeding of 8th International Conference on Earthquake Geotechnical Engineering*, Japanese Geotechnical Society Special Publication, Vol.10, No. 24, 878-882. <https://doi.org/10.3208/jgssp.v10.OS-13-01>
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- (4) Abdialim, S., Hakimov, F., Ku, T., Kim, J. and Moon, S.W. (2023). "Site effect assessment via dynamic analysis—Bukit Timah Granite." *Proceeding of 17th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering*, Astana, Kazakhstan, 1609-1613.
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- (6) Zhang, Y., Ku, T., Goh, K.H., and Jeyatharan, K. (2021). "Case study of geophysical surveys for profiling soil / rock interface in Singapore." *Proceeding of 6th International Conference on Geotechnical and Geophysical Site Characterization (ISC'6)*, Budapest, Hungary, 7p.
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- (23) Khan, Q., Subramanian, S., Moon, S.W. and Ku, T. (2017) "Determining arrival time of shear waves in bender element test: Idealized sine wave approach." *19th International Conference on Soil Mechanics and Geotechnical Engineering (ICSMGE2017)*, Korean Geotechnical Society, 411-414.
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- (28) Moon, S.W. and Ku, T. (2015). "Determination of in-situ shear wave velocity profile in Singapore from MASW." *Near Surface Asia Pacific Conference (2015 SEG Conf.)*, Waikoloa, Hawaii, 4p.
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CONFERENCE PROCEEDINGS (Domestic)

- (1) Shin, C. H., Lim, D., and Ku, T. (2025). "Optimizing HVSr parameters for evaluating the fundamental frequency of ground in Seoul." *Proceedings of KGS Spring National Conference 2025*, Gwangju, 2p.
- (2) Hwang, S-H. and Ku, T. (2025). "Detecting bedrock depth by cross-correlation seismic interferometry using traffic noise in Seoul." *Proceedings of KGS Spring National Conference 2025*, Gwangju, 2p.
- (3) Lim, D. and Ku, T. (2025). "Feasibility study on the application of full waveform inversion for detecting the soil-rock interface." *Proceedings of KGS Spring National Conference 2025*, Gwangju, 2p.
- (4) Gwak, D. and Ku, T. (2024). "Stress history evaluation based on CPT data using machine learning." *Proceedings of KGS Fall National Conference 2024*, Busan, 2p.
- (5) Gwak, D., Lim, D., and Ku, T. (2024). "Machine learning-based stress history evaluation of soils using CPT data." *Proceedings of KGS Spring National Conference 2024*, Jeju, 2p.
- (6) Ku, T. (2023). "Evaluating the influence of sand on strength development of cement-treated sandy clay using new mix design parameters." *2023 Fall meeting*, Korean Geosynthetics Society, Suncheon National University, 2p.

PRESENTATIONS

- (1) Ku, T. and Ng, Y. (2025). "Site investigation using crosshole tomography: Case study in Singapore." *2025 Spring meeting*, Korean Geotechnical Society, Gwangju, Korea
- (2) Ku, T. (2025). "Evaluation of strength development characteristics of CSA cement-treated soil for sustainable geotechnical ground improvement." *2025 Spring meeting*, Korean Geosynthetics Society, Seoul, Korea.
- (3) Ku, T. (2024). "Crosshole tomography for geotechnical site characterization: A case study." *3rd Workshop on Geophysical Aspects of Smart Cities*, Society of Exploration Geophysicists (SEG) & European Association of Geoscientists and Engineers (EAGE), Hanyang University, Korea.
- (4) Ku, T. and Subramanian, S. (2024). "Unified Strength Prediction Model for Cemented Soils." *The 2024 International Conference on Geomechanics and Engineering (ICGE2024)*, ACEM24, Seoul, Korea.
- (5) Ku, T. (2023). "Evaluating the influence of sand on strength development of cement-treated sandy clay using new mix design parameters." *2023 Fall meeting*, Korean Geosynthetics Society, Suncheon National University, Korea. [selected as the best paper presentation]
- (6) Ku, T. (2022). "Advanced near-surface geophysics for geotechnical site investigation: invasive and non-invasive methods." *Invited talk (SEP 2022)*, BK21 Seminar Series: New Frontiers of InfraSPHERE, Seoul National University.
- (7) Ku, T. (2022). "Advanced site investigation by near-surface geophysics." *Invited talk (DEC 2022)*, Seminar by Technical Committee of Soil Dynamics & Geotechnical Earthquake Engineering, Korean Geotechnical Society, online.
- (8) Ku, T. (2021). "Near-Surface Geophysics for Geotechnical Site Investigation: Case Studies in Singapore." *Invited talk - 4th Asia Pacific Meeting on Near Surface Geoscience & Engineering*, European Association of Geoscientists and Engineers (EAGE), Ho Chi Minh City, Vietnam.
- (9) Ku, T. (2020). "Geophysical site characterization: Advances in invasive and noninvasive survey methods." *2nd US-Korea Geotech Workshop*, Korean Geotechnical Society – North America (KGS-NA), University of Nebraska-Lincoln.
- (10) Lo, M.C., Fu, N., and Ku, T. (2020). "Development of soil stratification from CPT based on machine learning." *Invited talk - Technical Sharing Session (Dec 2020)*, Land Transport Authority (LTA) Academy, Singapore.
- (11) Ku, T. (2020). "Geophysical site investigation- Case studies: crosshole tomography & surface wave tests." *Invited talk (Aug 2020)*, Singapore Accreditation Council (SAC) Inspection Body – TC SI meeting, Singapore.
- (12) Ku, T., Zhang, Y., Wei, X., and Li, Y. (2019). "HVSr processing and applications in Singapore." *SEG/EAGE Workshop: Geophysical Aspects of Smart Cities*, Singapore.

- (13) Nilot, E., Li, Y., Zhang, Y., and Ku, T. (2019). "Deep bedrock detection based on seismic interferometry using ambient noise in Singapore." *SEG/EAGE Workshop: Geophysical Aspects of Smart Cities*, Singapore.
- (14) Ku, T. (2019). "Advanced near-surface geophysics for geotechnical site investigation." *Invited talk (November 2019)*, Nazarbayev University, Nur-sultan, Kazakhstan.
- (15) Zhang, Y. and Ku, T. (2019). "HVSr measurement and applications in Singapore." *16th Annual Meeting of Asia Oceania Geosciences Society (July 2019)*, Session: Solid Earth Sciences – Geotechnical & Geophysical Site Characterization, Singapore.
- (16) Zhang, Y., Li, Y., and Ku, T. (2019). "Challenges of near-surface seismic imaging." *3rd NUS Upstream Petroleum Research Initiative (NUPRI) Workshop (May 2019)*, University Town, National University of Singapore.
- (17) Subramanian, S. and Ku, T. (2018). "Strength of CSA treated sand with varying gypsum content." *2018 International Academic Forum on the Urban Environmental Geo-engineering and Geo-hazard Prevention Technologies*, NUS.
- (18) Khan, Q., Subramanian, S., Wong, D.Y.C., and Ku, T. (2018) "Bender elements in stiff cemented clay: shear wave velocity (V_s) correction by applying wavelength considerations." *2018 International Academic Forum on the Urban Environmental Geo-engineering and Geo-hazard Prevention Technologies*, NUS.
- (19) Wong, D.Y.C., Lee, F.H., Goh, S.H., and Ku, T. (2018). "Detection of heterogeneity in cement-admixed soil using geophysical measurements." *2018 International Academic Forum on the Urban Environmental Geo-engineering and Geo-hazard Prevention Technologies*, NUS.
- (20) Ng, Y.C.H., Danovan, W., and Ku, T. (2018). "Seismic cross-hole tomography for near-surface site investigation: a case study on a reclaimed land." *GeoShanghai International Conference 2018*, China. (Honor - **Best Poster Award**)
- (21) Ku, T. and Ng, Y.C.H. (2018). "Application of in-situ seismic waves for geotechnical site characterization." *Invited talk (May 2018)*, Tongji University, China.
- (22) Zhang, Y.*, Li, Y., Zhang, H., and Ku, T. (2018). "Near-surface site investigation by seismic interferometry using urban traffic noise." *2nd NUPRI Workshop (May 2018)*, University Town, National University of Singapore.
- (23) Ku, T. (2017). "Seismic wave-based geocharacterization: post-processing of auto source SCPT signal & bedrock estimation using MASW." *Invited talk (June 2017)*, Korea University, Seoul, South Korea.
- (24) Subramaniam, P., Zhang, Y., and Ku, T. (2017). "Non-invasive geophysical study for bedrock evaluation - part I & II (Poster Presentation)." *LTA Future Mobility Symposium 2017*, Suntec City Convention, Singapore.
- (25) Ku, T. (2016). "Geophysical site investigations: surface wave method & continuous-interval SCPT." *Invited talk (June 2016)*, Kyung Hee University, Suwon-si, South Korea.
- (26) Ku, T. (2016). "Non-invasive geophysical study for bedrock evaluation." *Inaugural TRC@NUS Workshop*, NUS-LTA Transport Research Center, Singapore.
- (27) Ku, T. (2016). "Geophysical site characterization using in-situ seismic waves." *Invited talk (FEB 2016)*, Arizona State University, US.
- (28) Ku, T. (2015). "Geophysical site characterization: some advanced geotechnical applications." *Invited talk (June 2015)*, Geotechnical Seminar, Geotechnical Society of Singapore, Singapore.
- (29) Ku, T. (2014). "Wave-based geocharacterization: some recent applications." *Invited talk (June 2014)*, Korea Institute of Civil Engineering & Building Technology, Goyang-si, South Korea.
- (30) Ku, T. (2013). "Evaluation of stress history & geostatic stress state using directional shear waves." *Invited talk (July 2013)*, Yonsei University, Seoul, South Korea.
- (31) Ku, T., Weemee, I., Cargill, E., Mayne, P.W., and Woeller, D. (2012). "Post-processing of continuous shear wave signals." *ASTM D-18 Symposium*, Dynamic Testing of Soil & Rock: Field and Laboratory, San Diego, CA.
- (32) Ku, T., Mayne, P.W., and Gutierrez, B.J. (2010). "Difficulties in evaluating geotechnical stress state at Savannah River Site, South Carolina (Oral Presentation)." *AEG Annual Meeting*, Association of Environmental and Engineering Geologists (AEG), Charleston, SC.
- (33) Ku, T., Mayne, P.W., and Gutierrez, B.J. (2010). "Hierarchy of shear wave velocity modes in soils (Oral Presentation)." *AEG Annual Meeting*, Association of Environmental and Engineering Geologists (AEG), Charleston, SC.

- (34) Ku, T., and Mayne, P.W. (2011). "Shear wave velocity-stress relationship in soil (Poster Presentation)." *Georgia Tech Research and Innovation Conference (GTRIC 2011)*, GT Student Ballroom, Atlanta, GA.
- (35) Ku, T., and Mayne, P.W. (2011). "Post-processing of continuous shear wave signals (Poster Presentation)." *14th Annual George F. Sowers Symposium*, GT Student Ballroom, Atlanta, GA.
- (36) Ku, T., Mayne, P.W., and Gutierrez, B.J. (2010). "Geostatic stress state and stiffness anisotropy from directional shear wave velocity measurements at SRS (Poster Presentation)." *13th Annual George F. Sowers Symposium*, GT Student Ballroom, Atlanta, GA.
- (37) Ku, T., Gutierrez, B.J. and Mayne, P.W. (2009). "Stiffness anisotropy from directional shear wave velocities at SRS (Poster Presentation)." *12th Annual George F. Sowers Symposium*, GT Student Ballroom, Atlanta, GA.

VI. RESEARCH PROJECTS & GRANTS at NUS

Research Projects at Konkuk University, Korea

- Principal Investigator (National Research Foundation of Korea) Mar. 2023 – Feb. 2028
 - Project title: 'Development of a new sequential underground mapping framework incorporating advanced non-invasive geophysical approaches in urban environments (\$570,000)
 - 한국연구재단, 개인기초연구지원사업 - 우수신진연구
- Principal Investigator (National Research Foundation of Korea) Sep. 2023 – Feb. 2024
 - Project title: 'Development of a new sequential underground mapping framework incorporating advanced non-invasive geophysical approaches in urban environments (\$44,000)
 - 한국연구재단, 개인기초연구지원사업 - 최초혁신연구실

Research Projects at NUS, Singapore [Note: 1 SGD (\$\$) \approx 0.75 USD, as of DEC. 2023]

- Principal Investigator (Ministry of National Development, SG) Feb. 2021 – Jan. 2023
 - Project title: 'Advanced Geological Mapping Using Machine Learning Technique' (\$855,840)
 - Ongoing project (LTA- Cities of Tomorrow (CoT) R&D Programme)
- Principal Investigator (Ministry of Education, Singapore) Mar. 2018 – Feb. 2021
 - Project title: 'Characterizing Calcium Sulfoaluminate-treated Soil with Application towards Eco-friendly Ground Improvement' (\$150,527)
- Co-Principal Investigator (Ministry of National Development, Singapore) July. 2016 – Dec. 2020
 - Project title: 'Technology for Cement-treatment of Ground in Areas Obstructed by Obstacles' (\$2,850,000) – L2NIC
- Principal Investigator (Land Transport Authority, Singapore) Sep. 2016 – Feb. 2019
 - Project title: 'Non-invasive Geophysical Study for Bedrock Evaluation' (\$435,840)
- Co-Principal Investigator (Land Transport Authority, Singapore) July. 2016 – Dec. 2017
 - Project title: 'Optimized Design of Ground Improvement Schemes for Tunnels and Earth Retaining Stabilizing Structures' (\$425,400)
- Principal Investigator (Ministry of Education, Singapore) Mar. 2015 – Feb. 2018
 - Project title: 'Evaluation of Ground Compaction Quality Using Elastic Waves' (\$160,000)

- Principal Investigator (Ministry of Education, Singapore) Dec. 2013 – Nov. 2016
 - Project title: 'Shear Wave Velocity Characteristic of Singapore Marine Clay and Its Geotechnical Implications' (S\$179,994)
- Graduate Research Assistant at Georgia Institute of Technology Jan. 2009 – Dec. 2012
 - Project title: 'Comprehensive GeoCharacterization of Santee Formation and Its Implications for Engineering Behavior at SRS', funded by US Dept. of Energy and Savannah River Site, SC