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I. EARNED DEGREES

2006.03.01-2010.08.20 Ph. D. in Geotechnical Engineering Program, Department of Civil and Environmental Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Republic of Korea (KAIST 2009 (Ph.D) 405) (GPA = 3.78 / 4.3; ID: 20065141).

2004.03.01-2006.02.17 M.S. in Geotechnical Engineering Program, Department of Civil and Environmental Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Republic of Korea (KAIST 2005 (M.S) 233) (GPA = 4.09 / 4.3; ID: 20043509).

2000.03.01-2004.02.20 B.S. in Department of Civil and Environmental Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Republic of Korea (KAIST 2003(B.S) 234) (GPA = 3.76 / 4.3; ID: 20000412).

II. EMPLOYMENT

2020.09.01 – present *Associate Professor,* Department of Civil Systems Engineering, Ajou University, Republic of Korea (ID: 202010517)

2020.09.01 – present *Adjunct Senior Lecturer*, School of Engineering and Information Technology (SEIT), University of New South Wales (UNSW), Canberra, ACT, Australia (ID: z3522023).

2018.07.01-2020.08.31 *Senior Lecturer* (Level C), School of Engineering and Information Technology (SEIT), University of New South Wales (UNSW), Canberra, ACT, Australia (ID: z3522023).

2017.04.03-2018.06.30 *Lecturer* (Level B), SEIT, UNSW Canberra, ACT, Australia (ID: z3522023).

2016.03.01-2017.03.01 *Adjunct Associate Professor*, Department of Geotechnical & Geo-Space Engineering, University of Science & Technology (UST), Daejeon, Republic of Korea (ID: 22857).

2011.12.28-2017.02.28 *Senior Researcher*, Geotechnical Engineering Research Institute, Korea Institute of Civil Engineering and Building Technology (KICT), Republic of Korea (ID: 11436).

2014.09.01-12.31 & 2015.09.01-12.31 *Invited Professor*, Department of Civil and Environmental Engineering (DCEE), Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Republic of Korea.

2011.04.01-2011.12.27 *Research Assistant Professor*, DCEE, KAIST, Daejeon, Republic of Korea

2010.09.01-2011.03.31 *Post-Doctoral Researcher*, KAIST Institute of Applied Science, KAIST, Daejeon, Republic of Korea.

2002.07.01-2003.01.31 *Internship*, Samsung Human Resources Development Center, Samsung Group, Seoul, Republic of Korea

III. ACADEMIC EXPERIENCES

3.1. Teaching Activities

Participation in Teaching-Development Programs

Undergraduate Teaching

Roles: CI (Course Instructor), T (Tutor), I (Laboratory instructor), L (Lecturer)

Ajou University, Department of Civil Systems Engineering

Code (credits)	Course	Sessions (enrolments)	Role
CVL331 (3)	Soil Mechanics	2021-S1 (32)	CI
CVL335 (3)	Foundation Engineering and Design[E)]	2021-S2 ( ); 2020-S2 (12)	CI
CVL301 (3)	Civil Engineering Construction Practice	2021-S2 ( )	CI
CVL433 (3)	Ground Stability Analysis and Design[E)]	2021-S1 (17)	CI

[E)] Course taught in English

University of New South Wales, School of Engineering and Information Technology (All courses taught in English)

Code (credits)	Course	Sessions (enrolments)	Role
ZEIT1503 (6)	Engineering Mechanics	2017-S2; 2018-S2	T & I
ZEIT2603 (6)	Civil Engineering Materials	2018-S1 (25)	CI & L
ZEIT3602 (6)	Geotechnical Design	2020-S1 (15); 2019-S1 (20)	L
ZEIT3606 (6)	Foundation and Pavement Engineering	2020-S2 (19); 2019-S2 (38); 2018-S2 (15)	CI & L
ZEIT4004 (6)	Geosynthetics and Ground Improvement	2020-S1 (8); 2019-S1 (12); 2018-S1 (11)	CI & L

Korea Advanced Institute of Science and Technology, Department of Civil and Environmental Engineering

Code (credits)	Course	Sessions (enrolments)	Role
CE231 (3)	Soil Mechanics and Laboratory (II)	2015-S2 (13), 2014-S2 (13)	CI

Graduate Teaching

Ajou University, Department of Civil Systems Engineering

Code (credits)	Course	Sessions (enrolments)	Role
CVL670 (3)	Advanced Geoenvironmental Engineering	2021-S1 (7)	CI
CVL6713 (3)	Special Topics on Soil Dynamics	2020-S2 (4)	CI

Teaching Assessment / Feedback

Undergraduate teaching – Ajou University

Form	Year / Session	Course (Code / Title)	Language	Comparison statistics (Max: 5.0)			
				Course	Department	School	Univ.
SF	2021/S2	CVL335 Foundation Engineering and Design	English				
SF	2021/S2	CVL301 Civil Engineering Construction Practice	Korean				
SF	2021/S1	CVL433 Ground Stability Analysis and Design	English	**4.79**	4.49	4.38	4.41
SF	2021/S1	CVL331 Soil Mechanics	Korean	**4.63**	4.49	4.38	4.41
SF	2020/S2	CVL335 Foundation Engineering and Design	English	**4.78**	4.42	4.29	4.33

Undergraduate teaching – UNSW, KAIST

Form	Year / Session	Univ.	Course (Code / Title)	Role	Comparison statistics			
					Course		Instructor	
					Course	School	**I.Chang**	School
SF	2020/S2	UNSW	ZEIT3606 Foundation and Pavement Engineering	C, L	4.88/6.00	4.48/6.00	**5.44**/6.00	4.86/6.00
SF	2020/S1	UNSW	ZEIT4004 Geosynthetics and Ground Improvement	C, L	4.50/6.00	4.58/6.00	**6.00**/6.00	4.96/6.00
SF	2020/S1	UNSW	ZEIT3602 Geotechnical Design	L	5.00/6.00	4.58/6.00	**5.61**/6.00	4.96/6.00
SF	2019/S2	UNSW	ZEIT4605 Foundation and Pavement Engineering	L	4.75/6.00	4.47/6.00	**5.88**/6.00	4.77/6.00
SF	2019/S1	UNSW	ZEIT4004 Geosynthetics and Ground Improvement	C, L	5.23/6.00	4.51/6.00	**6.00**/6.00	4.88/6.00
SF	2019/S1	UNSW	ZEIT3602 Geotechnical Design	L	4.56/6.00	4.51/6.00	**5.89**/6.00	4.88/6.00
SF	2018/S2	UNSW	ZEIT4605 Foundation and Pavement Engineering	L	5.51/6.00	4.40/6,00	**5.53**/6.00	5.19/6.00
PR	2018/S2	UNSW	ZEIT1503 Engineering Mechanics	L	-	-	[(a)]	-
SF	2018/S1	UNSW	ZEIT4004 Geosynthetics and Ground Improvement	C, L	5.35/6.00	4.38/6.00	**6.00**/6.00	5.18/6.00
SF	2018/S1	UNSW	ZEIT2603 Civil Engineering Materials	C, L	4.67/6.00	4.38/6.00	**5.25**/6.00	5.18/6.00
PR	2018/S1	UNSW	ZEIT4004 Geosynthetics and Ground Improvement[(b)]	C, L	-	-	**5.75**/6.00	-
SF	2015/S2	KAIST	CE231/Soil Mechanics & Laboratory II	C, L	-	-	**4.84**/5.00	4.18/5.00
SF	2014/S2	KAIST	CE231/Soil Mechanics & Laboratory II	C, L	-	-	**4.20**/5.00	4.12/5.00

※ SF: Students Feedback (Ajou University Student survey; UNSW MyExperience; KAIST Student survey) / PR: Peer Review of Teaching (UNSW)

※ Role: C (Course coordinator), L (Lecturer)

[(a)] 'Peer instruction/delegating style' Reviewed by Dr. Dijana Townsend (UNSW Canberra) on August 16, 2018

[(b)] Reviewed by Assoc. Profs. Paul Tranter (SOS) and Eleanor Hancock (SHSS), UNSW Canberra on May 29, 2018

Post-graduate teaching

Form	Year / Session	Course (Code / Title)	Language	Comparison statistics (Max: 5.0)		
				Course	Department	School
SF	2021/S1	CVL670 Advanced Geoenvironmental Engineering	Korean	**4.87**		4.60
SF	2020/S2	CVL6713 Special Topics on Soil Dynamics	Korean	**4.91**	4.97	4.61

Certificate of Achievement

2019.02.12 ~2019.04.02 "Foundations of University Learning and Teaching (FULT) Program", 4 Mods (Mod1: Learning & Teaching; Mod2: Educational Design; Mod3: Assessment & Feedback; Mod4: Reflection and Evaluation of Teaching Practice) training course, UNSW, Canberra, Australia.

2019.03.18 "Working with Academic Integrity 2019", The Learning Centre, UNSW, Sydney, Australia

2017.11.02 "Essentials of Supervision", Workshop, Post Graduate Research Office, UNSW, Canberra, Australia.

2017.04.27 "Lab Supervisor Training", Work Health and Safety Office, UNSW, Canberra, Australia

2007.08.06	"Soil and Sediment Remediation Technologies", One day continuing professional development short course, Sri Lankan Geotechnical Society and European Community Asia-Link, Colombo, Sri Lanka.
2007.07.14	The Seven Habits of Highly Effective Students, Franklin Covey Co., KAIST, Korea.
2006.04.21	ITA Training Course in Seoul, International Tunneling Association, Korea.

3.2. Individual Student Guidance

Post-Doctoral Fellow Guidance – Visiting Scholars

Ryu, Byeong-Hyun	2014.01~2017.02
Research	Lunar soil and aerospace engineering studies
Current Position	Senior Researcher, KICT, Korea

Ph.D. Student Guidance

In Progress

Lee, Sojeong	2017.08~Present / Main supervisor
Thesis:	Strengthening mechanism of biopolymer-treated sand: From micro to macro
Current Position:	Graduate student (Ph.D. candidate) at UNSW Canberra, Australia
Lee, Min-Hyung	2018.01~Present / Co-supervisor (Main supervisor: Prof. Gye-Chun Cho, KAIST)
Thesis:	Study on grouting performance in sandy soils (M.S. degree)
Current Position:	Graduate student (Ph.D. candidate) at KAIST, Korea
Beek, Moon-Kyeong	2020.09~Present / Main supervisor
Thesis:	TBD
Current Position:	Graduate student (Ph.D. candidate) at Ajou University, Korea
Kim, Si-Hoon	2020.09~Present / Main supervisor (Co-supervisor: Prof. Sang-Duk Lee, Ajou University)
Thesis:	TBD
Current Position:	Korea Rural Community Corporation (KRCC) / Ph.D. candidate at Ajou University
Hong, Seok-Bong	2020.09~Present / Main supervisor (Co-supervisor: Prof. Sang-Duk Lee, Ajou University)
Thesis:	TBD
Current Position:	Taeyoung Engineering & Construction / Ph.D. candidate at Ajou University
Suhyuk Park	2021.03~Present / Main supervisor
Thesis:	TBD
Current Position:	Graduate student (Ph.D. candidate) at Ajou University, Korea

Join Supervision

Liu, Zhiyong	2018.03~Present / Joint supervisor (Main supervisor Dr. Jianfeng Xue, UNSW Canberra)
Thesis:	The effects of stress disturbance on the long-term deformation behavior of soils under traffic loading
Current Position:	Graduate student (Ph.D. candidate) at UNSW Canberra, Australia
Fatehi, Hadi	2020.12~Present / External supervisor (Main supervisor: Dr. Dominic Ong; Associate Supervisor: Dr. Jimmy Yu)
Thesis:	Soil strength development using marine biopolymers: Geotechnical behaviour and subgrade improvement
Current Position:	Graduate student (Ph.D. candidate) at the School of Engineering and Built Environment, Griffith University, Australia

Completed

Kwon, Yeong-Man	2017.09~2021.08 / Co-supervisor (Main supervisor: Prof. Gye-Chun Cho, KAIST)
Thesis:	Geotechnical engineering behaviors of xanthan gum treated kaolin-group minerals
Current Position:	Post-graduate researcher at KAIST, Korea
Im, Jooyoung	2016.01~2020.08 / Co-supervisor (Main supervisor: Prof. Gye-Chun Cho, KAIST)
Thesis:	Polysaccharide biopolymers in sands: Properties and behaviors

Current Position: Post-Doctoral Researcher, King Abdullah University of Science and Technology (KAUST), Saudi Arabia

An Thi Phuoung Tran 2016.01~2019.08 / Co-supervisor (Main supervisor: Prof. Gye-Chun Cho, KAIST)
Thesis: Characterization of biopolymer-treated soils considering soil-water-hydrogel interaction
Current Position: Lecturer, Hue University, Vietnam

M.S. Student Guidance

In Progress

Kim, Giyoon 2020.09~Present / Main supervisor
Thesis: TBD
Current Position: Graduate student (M.S. candidate) at Ajou University, Korea

Yang, Donghyeon 2020.09~Present / Main supervisor
Thesis: TBD
Current Position: Graduate student (M.S. candidate) at Ajou University, Korea

Kim, Min-Tae 2021.03~Present / Main supervisor
Thesis: TBD
Current Position: Graduate student (M.S. candidate) at Ajou University, Korea

Lee, Hae-Jin 2021.09~Present / Main supervisor
Thesis: Big data / Machine learning application for BPST
Current Position: Graduate student (M.S. candidate) at Ajou University, Korea

Graduated (Completed)

Thanh, Nguyen Duc 2005.09~2006.08
Thesis: Study on grouting performance in sandy soils (M.S. degree)
Current Position: BlueScope Buildings Vietnam, Vietnam

Oh, Tae-Min 2007.09~2008.08
Thesis: Undrained shear strength estimation of marine clay using electrical resistivity and shear wave velocity (M.S. degree)
Current Position: Assistant Professor, Pusan National University (PNU), Korea

Thai, An Son 2008.09~2009.06
Thesis: 4-D tomography for large tri-axial cell (M.S. degree)
Current Position: Hyundai Heavy Industries, Vietnam Branch

Kim, Ah-Ram 2009.03~2010.12
Thesis: Soft soil improvement using deep cement mixing (DCM) technology (M.S. degree)
Current Position: Researcher, Korea Institute of Civil Engineering and Building Technology (KICT), Korea

Kharis, A. Prasidhi 2011.09~2013.05
Thesis: Conductivity characteristics of biopolymer treated soil
Current Position: Researcher, Samsung C&T Corporation, Korea

Im, Jooyoung 2013.03~2015.12
Thesis: Micro-scale behavior of biopolymer treated particulate materials
Current Position: Post-Doctoral Researcher, KAIST, Korea

Kwon, Yeong-Man 2015.09~2017.08
Thesis: Hydro-chemo characteristics of biopolymer-soil mixtures
Current Position: Ph.D. candidate, KAIST, Korea

Park, Suhyuk 2020.09~2021.02 / Main supervisor
Thesis: Evaluation of the pullout behavior of a ground reinforcement member considering different expansion width and inclination conditions
Current Position: Graduate student (Ph.D. candidate) at Ajou University, Korea

Undergraduate (UG) Student Guidance

In Progress

TBD — 2021.09~Present (Year 4 UG at Ajou University)
Thesis: TBD

Completed

Ms. Jang, Ha-Young — 2021.03~2021.06
Topic: BPST application for mine tails and slope surface stabilization
Current Position: Year 4 UG at Ajou University

Mr. Barrie Titulaer — 2020.03~2020.11
Thesis: Investigating the feasibility of biopolymers as a substitute for conventional bentonite slurries used in tunnel boring machine (TBM) and ground excavation Practices
Current Position: Engineer, Snowy Hydro, Australia

Mr. Lauchlan Joiner — 2020.03~2020.11
Thesis: Effect of xanthan gum on the piping erosion resistance of a Sydney sand soil
Current Position: Year 4 UG at UNSW Canberra

Mr. Fletcher Evans — 2020.03~Recent
Thesis: Investigation of the electrical conductivity behaviour of biopolymer-treated Sand
Current Position: Officer Cadet of the Royal Australian Air Force

Lt. Bandit Khiewdum — 2019.07~2020.06
Thesis: Improving the soil erosion resistance with advance bio-soil technology
Current Position: Second Lieutenant of the Royal Thai Army

Lt. Olivier Ronald Beaumont — 2019.03~2019.11
Thesis: Feasibility study on biopolymer application to the subbase layers of road structures
Current Position: Lieutenant of the Australian Army

Mr. Joshua Paul Daniel — 2019.03~2019.11
Thesis: Improving the soil erosion resistance with advance bio-soil technology
Current Position: Industry, Melbourne, Australia

Lt. Jake Finnane — 2019.03~2019.11
Thesis: Feasibility studies on the durability behaviors of biopolymer-treated sands
Current Position: Lieutenant of the Australian Army

Lt. Nathan Petersen — 2019.03~2019.11
Thesis: Swelling behavior of biopolymer-clays and application as a new slurry material
Current Position: Lieutenant of the Australian Army

Thesis Evaluation Committee

Ph.D. Dissertation

Dr. Yeong-Man Kwon — Date of Thesis Defense: 2021.06.11
Thesis: Geotechnical engineering behaviors of xanthan gum treated kaolin-group minerals
Current Position: Post-doctoral researcher, KAIST

Dr. Yong-Min Kim — Date of Thesis Defense: 2021.06.11
Thesis: Bio-Sealing Technique Using Microbially Induced and Enzyme-induced Biopolymer Formation
Current Position: Researcher, Korea Atomic Energy Research Institute (KAERI)

Dr. Jooyoung Im — Date of Thesis Defense: 2020.06.15
Thesis: Polysaccharide Biopolymers in Sands: Properties and Behaviors

Current Position: Post-doctoral researcher, KAIST

Dr. Kyunseong Dae — Date of Thesis Defense: 2020.06.11
Thesis: Investigation on the Growth Kinetics of Inorganic Crystalline Nanomaterials using In-Situ Electron Microscopy
Current Position: Post-doctoral researcher, KAIST

Dr. An Thi Phuong Tran — Date of Thesis Defense: 2020.05.29
Thesis: *Characterization of biopolymer-treated soils considering soil-water-hydrogel interaction*
Current Position: Lecturer, Hue University, Vietnam

M.S. Dissertation

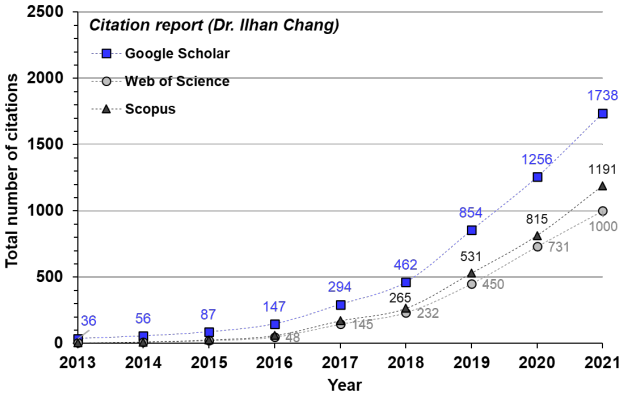
Mr. Suhyuk Park — Date of Thesis Defense: 2020.11.24
Thesis: Evaluation of the pullout behavior of a ground reinforcement member considering different reamed depth and inclination conditions
Current Position: Graduate student (Ph.D. candidate), Ajou University, Korea

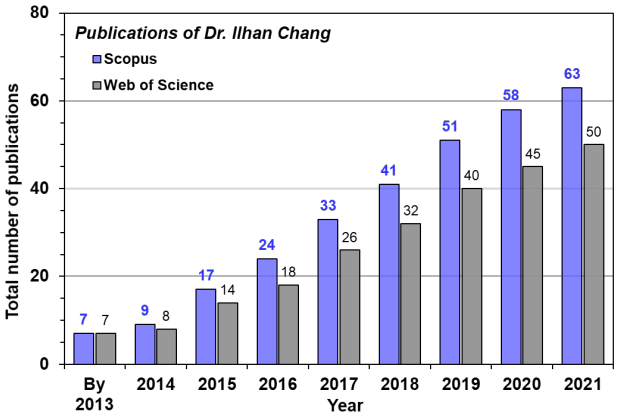
IV. SCHOLARLY ACCOMPLISHMENTS

4.0. Overall status

Research Outputs (Number of publications and Citations) – Data from Scopus and Google Scholar (August 11, 2021)

(Data: August 11, 2021)	Documents	Total citations	h-index	i10-index
Web of Science	50	1000	16	25
Scopus	63	1191	18	26
Google scholar	117	1739	19	30





4.1. Research Interests

- E3 (*Emerging*-, *Environmental*- and *Extreme*-) geotechnical engineering
- Biopolymer-based Soil Treatment (BPST) technology: from Fundamentals to Practices
  - Geotechnical engineering parameter evaluation of natural; engineered; and biopolymer-treated soils through integrated laboratory programs.
  - Microscopic soil-biopolymer-water-ion interaction characterization using advance *liquid cell* (*LC*) and *microfluidic chip* (*MFC*) microscopy methods, environmental scanning electron microscopy (ESEM), and transmission electron microscopy (TEM).
  - Soil mechanics and geotechnical engineering laboratory assessment via elastic wave-based consolidation test; mechanical (e.g. unconfined compressive) strength measurement, laboratory vane shear and fall cone tests; direct shear and cyclic simple shear (CSS) tests; static and cyclic triaxial tests; resonant column (RC); ultrasonic monitoring system equipped erosion function apparatus (EFA); modified hole erosion apparatus (mHEA); open-channel hydraulic flume erosion (HFE) apparatus; (unsaturated) soil-water-characteristic test system; freezing chamber and furnace facilities, and so on.
- - Sustainable geotechnical engineering solutions to combat climate change and desertification.
  - Biopolymer-based soil treatment (BPST) to reduce CO_2 emission related to geotechnical ground improvement practices.
  - BPST application for post-wildfire site geotechnical engineering hazards (e.g. erosion, debris flow) mitigation and site recovery (e.g. vegetation regeneration) promotion.
  - Soil erosion prevention and non-cement/asphalt earth stabilization using BPST.
  - Development of new environment friendly slope surface reinforcement and earthen levee construction technology using BPST.
- - Multi-disciplinary Geotechnical engineering solutions based on convergences between biotechnology, chemistry, climatology, soil science, aerospace engineering, military engineering, and social science.
  - BPST backfill development to mitigate electromagnetic waves around electricity utility tunnels.
  - BPST application to attenuate blast waves and reduce explosion damage for military geotechnical engineering structures.
  - Development of planetary soil (e.g. lunar regolith) simulants and geotechnical engineering construction method using in situ resource utilization (ISRO)
- - Practical implementation and commercialization of BPST technology.
  - In-situ implementation method (spraying, injection, mixing) and equipment development

4.2. Dissertations

Chang, Ilhan. (2010). Biopolymer treated Korean Residual Soil: Geotechnical behavior and Applications, *Ph. D. Thesis*, Korea Advanced Institute of Science and Technology, Daejeon, Republic of Korea. [cited: 8]

Chang, Il Han. (2006). Evaluation of the Consolidation State and Strength of Soft Clay using Shear Waves, *M.A.Sc. Thesis*, Korea Advanced Institute of Science and Technology, Daejeon, Republic of Korea. [cited: 2]

4.3. Published Books (or Book Chapter)

1. Cho, G.C., **Chang, I.**, and Im, J., 2021, *Microbial Biopolymers as an Alternative Construction Binder*, Chapter of *Microbial Polymers: An Ecological Perspectives* (Eds.: Vaishnav, A. and Choudhary, D.K.), pp. 581-617, Springer, Singapore. https://doi.org/10.1007/978-981-16-0045-6_23, ISBN: 978-981-16-0044-9 (May 1, 2021).
2. Cho, G.C. and **Chang, I.** (Eds.), 2019, *Geomechanics for Energy and a Sustainable Environment*, Special Issue published in the Energies journal, MDPI, ISBN: 978-3-03928-150-3, Basel, Switzerland.

4.4. Journal Publications

Legend

(*)	Corresponding Author
Bold Font	**Dr. Ilhan Chang**
Underline	Graduate student supervised by Dr. Ilhan Chang
IF	Journal Impact Factor by Journal Citation Report (JCR)
Number of citations	Counts from Google Scholar on August 11, 2021

Refereed Archival Journal Publications

Total Refereed Journal Publications	41
Journal Publications from work at Ajou University (2020.09~)	7
Journal Publications from work at UNSW (2017.04 ~2020.07)	20
Journal Publications from work prior to UNSW (~2017.03)	14

Published

1. **Chang, I.**, Kwon, Y.M., and Cho, G.C.*, 2021, "Effect of pore-fluid chemistry on the undrained shear strength of xanthan gum biopolymer treated clays", *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE (Accepted: 2021.06.25). [IF: 4.012 (2020); JCR Rank: Q1 (55/235)]
2. Fatehi, H.*, Ong, D.E.L., Yu, J., and **Chang, I.**, 2021, "Biopolymers as green binders for soil improvement in geotechnical applications: A review", *Geosciences*, MDPI, Vol. 11, No. 7, Article 291, 39 pages (2021.07.15) (https://doi.org/10.3390/geosciences11070291).
3. Kwon, Y.M., Cho, G.C., Chung, M.K., and **Chang, I.***, 2021, "Surface erosion behavior of biopolymer-treated river sand", *Geomechanics and Engineering*, Techno Press, Vol. 25, No. 1, pp. 49-58. (2021.04.15) (https://doi.org/10.12989/gae.2021.25.1.049) [IF: 3.223 (2020); JCR Rank: Q1 (36/171)] [cited: 3]
4. Lee, M., Im, J., **Chang, I.**, and Cho, G.C.*, 2021, "Evaluation of injection capabilities of a biopolymer-based grout material", *Geomechanics and Engineering*, Techno Press, Vol. 25, No. 1, pp. 31-40. (2021.04.15) (https://doi.org/10.12989/gae.2021.25.1.031) [IF: 3.223 (2020); JCR Rank: Q1 (36/171)]
5. Qureshi, M.U.*, Alsaidi, M., Aziz, M., **Chang, I.***, Rasool, A.M., and Kazmi, Z.A., 2021, "Use of reservoir sediments to improve engineering properties of dune sand in Oman", *Applied Sciences*, MDPI, Vol. 11, No. 4, Article 1620, 13 pages (2021.02.10) (https://doi.org/10.3390/app11041620) [IF: 2.679 (2020); JCR Rank: Q2 (55/169)]. [cited: 1]
6. Lee, M., Im, J., Cho, G.C., Ryu, H.H., and **Chang, I.***, 2020, "Interfacial shearing behavior along xanthan gum biopolymer-treated sand and solid interfaces and its meaning in geotechnical engineering aspects", *Applied Sciences*, MDPI, Vol. 11, No. 1, Article 139, 23 pages (2020.12.25) (https://doi.org/10.3390/app11010139). [IF: 2.679 (2020); JCR Rank: Q2 (55/169)] [cited: 3]
7. Ryu, B.H., Lee, S., and **Chang, I.***, 2020, "Pervious pavement blocks made from recycled polyethylene terephthalate (PET): Fabrication and engineering properties", *Sustainability*, MDPI, Vol. 12, No. 16, Article 6356, 10 pages (2020.08.07) (https://doi.org/10.3390/su12166356). [IF: 3.251 (2019); JCR Rank: Q3 (160/302] [cited: 1]

8. **Chang, I.**, Lee, M., Tran, A.T.P., Lee, S., Kwon, Y.M., Im, J., and Cho, G.C.*, 2020, "Review on biopolymer-based soil treatment (BPST) technology in geotechnical engineering practices", *Transportation Geotechnics*, Elsevier, Vol. 24, Article 100385, 22 pages (2020.09.01; Published online: 2020.06.10) (https://doi.org/10.1016/j.trgeo.2020.100385). [IF: 3.293 (2020); JCR Rank: Q1 (39/171] [cited: 18]

9. Choi, S.G., **Chang, I.**, Lee, M, Lee, J., Han, J.T., and Kwon, T.H.*, 2020, "Review on geotechnical engineering properties of sands treated by microbially induced calcite precipitation (MICP) and biopolymers", *Construction and Building Materials*, Elsevier, Vol. 246, Article 118415, 14 pages, (2020.06.20; Published online: 2020.02.22) (https://doi.org/10.1016/j.conbuildmat.2020.118415) [IF: 6.141 (2020); JCR Rank: Q1 (13/171)] [cited: 34]

10. Kwon, Y.M., Ham, S.M., Kwon, T.H., Cho, G.C., and **Chang, I.***, 2020, "Surface-erosion behaviour of biopolymer-treated soils assessed by EFA", *Géotechnique Letters,* ICE Publishing, Vol. 10, No. 2, pp. 106-112 (2020.06.01; Published online: 2019.12.20) (https:// doi: 10.1680/jgele.19.00106). [IF: 2.462 (2020); JCR Rank: Q3 (34/62)] [cited: 10]

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8. Lee, S., Titulaer, B., and **Chang, I.***, 2021, "Xanthan gum biopolymer-based clay mixtures as a new slurry material for TBM excavation", *Tunnel and Underground Space Technology*, Elsevier
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4.5. Conference Papers

International

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2. Lee, M., Im, J., **Chang, I**, and Cho, G.C., 2020, "Injection behavior of a biopolymer-based grout material for hydraulic conductivity control in sandy soil", *Proceedings of the 2020 World Congress on Advances in Civil, Environmental, and Materials Research* (ACEM20), August 26-28, Global Education Center for Engineers (GECE), Seoul National University, 1 page.
3. Kwon, Y.M., Cho, G.C., and **Chang, I.**, 2020, "Surface erosion behavior of biopolymer-treated river sand", *Proceedings of the 2020 World Congress on Advances in Civil, Environmental, and Materials Research* (ACEM20), August 26-28, Global Education Center for Engineers (GECE), Seoul National University, 1 page.
4. Seo, S., Chung, M., and **Chang, I.**, 2020, "Evaluation of on-site applicability for biopolymer treated soil using wet spraying method", *Proceedings of the 2020 World Congress on Advances in Civil, Environmental, and Materials Research* (ACEM20), August 26-28, Global Education Center for Engineers (GECE), Seoul National University, 1 page.
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11. Kwon, Y.M., **Chang, I.**, Lee, M., and Cho, G.C., 2019, "The effect of soil composition and xanthan gum biopolymer on the undrained shear strength", *Proceedings of the 16th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering*, October 14-18, Taipei International Conference Center, Taiwan, ID: SF01-01-002, 4 pages.

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30. **장일한**, Awlia Kharis Prasidhi, 조계춘, 2013, "베타글루칸 계열 바이오폴리머를 이용한 흙의 강도 증진", 한국지반공학회 2013 년 봄학술대회 논문집, March 21-22, 2013, 영남대학교, pp. 363-370.
31. **장일한**, 이주형, 김동욱, 곽기석, 2012, "말뚝 기초 거동 모사를 위한 대형 실내 시험장치 구축", 대한토목학회 2012 년도 정기학술대회 논문집, Vol. 28, 대한토목학회, 광주, pp. 1054-1057.
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35. 오태민, **장일한**, 조계춘, 방은석, 김정호, 2008, "전단파속도를 이용한 해안점토의 비배수 전단강소 산정", 대한토목학회 2008 년도 정기학술대회 발표논문 초록집, Vol. 3: 지반공학, 터널공학, 대한토목학회, 대전, pp. 2115-2118
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37. **장일한**, 고영희, 이정학, 조계춘, 2005, "전단파를 이용한 준설매립 점토 지반의 압밀 상태 평가", 대한토목학회 2005 년도 정기학술대회 논문집, 대한토목학회, pp. 3421-3424.

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4.6. Intellectual Properties

Technical Transfer

1. **Slope stability and protection method development**; Technical transfer of patent "*Method of stabilization in soil using biopolymer* (Patent 10-1201413)" to UB E&C Ltd.; Period: January 2013–December 2017.12; Royalty: 100,000,000 KRW.
2. **Development of an eco-friendly indoor building material with biopolymers**; Technical transfer of patent "*Soil building material using biopolymer* (Patent 10-1688834)" to Jaeyoung E&C Ltd; Period: November 2014–November 2017; Royalty: 100,000,000 KRW.

Registered Patents

International

1. Cho, G.C. and **Chang, I**. inventors; Korea Advanced Institute of Science and Technology and Korea Institute of Civil Engineering and Building Technology, patentees. "Soil stabilization and improvement method using biopolymer", US Patent, Application: 14/434,188 (June 8th, 2015), Registration: US 9,944,855 B2 (April 17th, 2018). [cited: 1]

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2. Cho, G.C. and **Chang, I.** inventors; Korea Advanced Institute of Science and Technology, assignee. "Biopolymer-containing gel bar, producing method of the same, and construction method for soil erosion resistance improvement using the same (바이오폴리머-함유 젤 바 및 이를 이용하는 토양의 침식 저항 증진 시공 방법)", Korean patent, Application: 10-2019-0146768 (January 1, 2019); Reg: 10-2237837 (April 2, 2021)
3. Cho, G.C., Im, J., and **Chang, I.** inventors; Korea Advanced Institute of Science and Technology, assignee. "Soil composition including cross-linked biopolymer using organic acid and preparing method of the same (유기산에 의해 교차-결합된 바이오폴리머를 포함하는 흙 조성물 및 이의 제조 방법)", Korea patent, Application: 10-2018-0156926 (December 7, 2018); Registration: 10-2177623 (November 5, 2020).
4. Cho, G.C., Kwon, Y.M., Im, J., and **Chang, I.** inventors; Korea Advanced Institute of Science and Technology, assignee. "High pressure bio-mixed soil spraying equipment (바이오 혼합토 고압 분사장치)", Korean patent, Application: 10-2018-0017965 (February 13, 2018); Registration: 10-2089066 (March 9, 2020).
5. Cho, G.C., **Chang, I.**, Kwon, Y.M., and Im, J. inventors; Korea Advanced Institute of Science and Technology, assignee. "Water impermeable material for improving ground, Method for improving water impermeability in ground using the same, and Experimental apparatus for testing the same (지반 개량용 차수재, 이를 이용하는 지반 내 차수를 위한 개량 방법, 및 이를 테스트하기 위한 실험 장치)", Korea patent, Application: 10-2018-0001644 (January 5, 2018); Registration: 10-2040869 (October 30, 2019).
6. Cho, G.C., **Chang, I.**, and Chung, M.K. inventors; Korea Advanced Institute of Science and Technology and Korea Institute of Civil Engineering and Building Technology, patentees. "Construction equipment for soil reinforcement using biopolymer (바이오폴리머를 이용하는 토양 보강 시공 장비)", Korea patent, Application: 10-2017-0068390 (June 1, 2017); Registration: 10-1857522 (May 8, 2018).
7. Cho, G.C. and **Chang, I.** inventors; Korea Advanced Institute of Science and Technology, patentee. "Soil building material using biopolymer (바이오폴리머를 이용한 흙 건축 재료)", Korea patent, Application: 10-2015-0056859 (April 22, 2015); Registration: 10-1688834 (December 16, 2016).
8. Baek, Y., Kim, Y.S., **Chang, I.**, and Ryu, B.H., inventors; Korea Institute of Civil Engineering and Building Technology (KICT), patentee. "Optimum Korean type artificial lunar soil and method for producing the same (한국형 인공 월면토 및 그 제조 방법)", Korea patent, Application: 10-2015-0139589 (October 5, 2015), Registration: 10-1664474 (October 4, 2016).
9. Cho, G.C. and **Chang, I.** inventors; Korea Advanced Institute of Science and Technology, patentee. "Germination or growth improvement method of vegetation using biopolymer (바이오폴리머를 이용한 식생의 발아 또는 생장 증진 방법)" Korea Patent, Priority: 10-2012-0112060 (October 9, 2012); Application: 10-2013-0090883 (July 31, 2013); Registration: 10-1551920 (September 1, 2015).
10. Cho, G.C. and **Chang, I.** inventors; Korea Advanced Institute of Science and Technology and Korea Institute of Construction Technology, patentees. "Improvement method of soil erosion resistance using biopolymer (바이오폴리머를 이용한 흙 침식 저항 증진 방법)" Korea Patent, Application: 10-2013-0090894 (July 31, 2013); Registration: 10-1544145 (August 4, 2015).

11. Lee, J.H., Chung, M.K., Kwak, K.S., Park, J.H., and **Chang, I.** inventors; Korea Institute of Construction Technology, patentee. "Complex suction foundation system using dual arranged inner and outer piles, and its installation method (내외부 석션 관부재의 이중배치에 의한 복합구조를 가지는 석션기초와 그 시공방법)" Korea Patent, Application: 10-2012-0111063 (October 8, 2012); Registration: 10-1398912 (May 19, 2014).
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13. Cho, G.C. and **Chang, I**. inventors; Korea Advanced Institute of Science and Technology, patentee. "Method of stabilization in soil using biopolymer (바이오폴리머를 이용한 흙 안정화방법)" Korea Patent, Application: 10-2011-0033093 (April 11, 2011); Registration: 10-1201413 (November 11, 2012).

Filed (under examination) Patents

International

1. Cho, G.C. and **Chang, I.** inventors; Korea Advanced Institute of Science and Technology and Korea Institute of Civil Engineering and Building Technology, assignee. "Soil stabilization and improvement method using biopolymer", Chinese Patent, Application: 201380064168.2 (June 8th, 2015).
2. Cho, G.C. and **Chang, I**. inventors; Korea Advanced Institute of Science and Technology and Korea Institute of Civil Engineering and Building Technology, assignee. "Improvement method of soil erosion resistance using biopolymer", PCT Patent, Application: PCT/KR2013/006906 (July 31st, 2013).

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3. Cho, G.C., Kwon, Y.M., Chang, I., and Lee, M.H. inventors; Korea Advanced Institute of Science and Technology, assignee. "Bio-polysaccharide application technology for lubrication and strength enhancement of geotechnical structures (지반 구조물 윤활 및 강도 증진을 위한 생체다당류 활용기술)", Korea patent, Application:
4. Cho, G.C. and **Chang, I.** inventors; Korea Advanced Institute of Science and Technology, assignee. "Equipment for ground improvement using biopolymer (바이오폴리머를 이용한 기초 지반 보강 장비)", Korean patent, Application: 10-2014-0168528 (November 28, 2014).

4.7. Other Publications – Special Articles

Domestic – Korea

1. 윤형구, **장일한**, 2013, "제 5 차 세계젊은지반공학인학회(iYGEC: 5th International Young Geotechnical Engineering Conference)를 참석하고", 한국지반공학회 학회지(지반), Vol. 29, No. 10, October 2013, pp. 50-53.
2. 장일한, **2013**, "미생물 배설물을 이용한 흙 처리 기술", 한국수자원학회 학회지(물과 미래; Water for Future), Vol. 46, No. 11, November 2013, pp. 83-89.
3. **장일한**, 조계춘, 2014, "Geo Atlanta 2014 를 통해 본 Bio-soil 연구의 최근 동향", 한국지반공학회 학회지(지반), Vol. 30, No. 5, May 2014, pp.25-29.
4. 유병현, **장일한**, 2014, "월면토란 무엇이고, 한국형 인공월면토 개발은 왜 필요한가요", 한국지반공학회 학회지(지반), Vol. 30, No. 9, September 2014, pp. 36-40.
5. 조계춘, **장일한**, 2016, "생태·환경 친화적 건설을 위한 미생물 기반 바이오폴리머 지반건설 재료 개발 현황 및 전망", 대한토목학회지, 특별기사 3, August 2016, pp. 16-21.

4.8. Presentations

Invited Keynote Lectures

1. *Biopolymer-based soil treatment (BPST): A new challenge for sustainable geotechnical engineering*, The 4th Sohar University Research Conference (SURC2021), June 16, 2021, Sohar, Oman (Online Conference via MS Teams).

Invited Seminars

2. *Biopolymer-based soil treatment (BPST) for environmentally friendly and sustainable Earthen levee construction*, K-Water Institute, February 25, 2021
3. *Civil and Environmental Engineering: Essentials creating the Future Earth. Step by step toward your dream*, KAIST CEE Special Invited Lecture for Career Design, Department of Civil and Environmental Engineering, Korea Advanced Institute of Science and Technology, October 26, 2020 (https://youtu.be/7h3euMD12ro)
4. *Biopolymer-based soil treatment (BPST) for environmentally friendly and sustainable development*, School of Engineering Fusion Research Colloquium, Ajou University, October 14, 2020.
5. *Biopolymer-based soil treatment (BPST): For sustainable and environmentally friendly electric power civil engineering*, Korea Electric Power Research Institute (KEPRI), Korea Electric Power Corporation (KEPCO), Daejeon, Korea, November 28, 2019.
6. *Biopolymer-based Soil Treatment (BST): For sustainable geotechnical engineering and to combat global climate change*, invited by the Department of Civil and Environmental Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea, May 28, 2019.
7. *Biopolymer-based Soil Treatment (BST): For sustainable geotechnical engineering and to combat global climate change*, invited by the Multi Disaster Countermeasures Organization, Korea Institute of Civil Engineering and Building Technology (KICT), Goyang, Korea, May 27, 2019.
8. *Future Challenges in Sustainable Geotechnical Engineering: Multi-disciplinary convergence and bio-soils*, invited by the School of Urban, Architecture and Civil Engineering (SUACE), Pusan National University (PNU), Busan, Korea, May 11, 2018.
9. *New Challenges in Geotechnical Engineering: Approaches through Multi-disciplinary (Bio-Geo Tech.) Convergence*, invited for High Degree Research (HDR) Student Seminar by the School of Engineering and Information Technology (SEIT), University of New South Wales, Canberra, Australia, June 28, 2017.
10. *New Challenges in Geotechnical Engineering: Approaches through Multi-Disciplinary Convergence*, invited by the School of Civil and Environmental Engineering (CEE), Nanyang Technological University (NTU), Singapore, February 8, 2017.
11. *Development of an Anti-Desertification Practice through Bio-Soil based Multi-Disciplinary Approaches*, invited by the Research Council (NTURC), Nanyang Technological University (NTU), Singapore, February 7, 2017.
12. *Geotechnical Engineering for Sustainable Development: Biopolymer-treated soil – From Theory to Practices*, invited by University of New South Wales – Canberra at Australian Defence Force Academy (ADFA), Canberra, ACT, Australia, September 23, 2016.
13. *Biopolymer-Soil approaches in Geotechnology*, invited by Korea Expressway Corporation, Kim-Cheon, Korea, September 5, 2016.
14. *Bio-Soil approaches in Geotechnical Engineering: For Soil Preservation and Improvement Practices*, invited by K-Water Institute, Daejeon, Korea, August 8, 2016.
15. *New Challenges in Geotechnical Engineering*: *Recent attempts through Bio-Soil Convergence,* invited by the Department of Civil and Environmental Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea, August 1, 2016.
16. *New Challenges in Geotechnical Engineering*: *Approaches through Multi-Disciplinary Convergence*, invited by the Department of Infrastructure Engineering, University of Melbourne, Melbourne, Australia, March 2nd, 2016.
17. *New Extreme Challenges in Geotechnical Engineering*, invited by the Creative Human Resources Center for Resilient Infrastructure, School of Civil and Environmental Engineering, Yonsei University, Seoul, Korea, May 20th, 2015.
18. *Soil treatment using biopolymers and Other research interests*, invited by Prof. J. Carlos Santamarina, Department of Civil and Environmental Engineer, Georgia Institute of Technology, Atlanta, GA, USA., November 30th, 2012.

19. *Soil treatment using biopolymers – Recent findings and future challenges*, invited by Prof. Gye-Chun Cho, Department of Civil and Environmental Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea, April 19th, 2012.

Conference Presentations

International

1. *River levee surface erosion mitigation using eco-friendly biopolymer-based soil treatment (BPST)*, The 9th International Symposium on Environmental Hydraulics, Global Education Center for Engineers, Seoul National University, July 21, 2021 (Onsite + online via Zoom).
2. *Biopolymer-based soil treatment (BST) for sustainable geotechnical engineering and to combat global climate change*, The 2nd US-Korea Geotech Workshop, University of Nebraska-Lincoln, October 23, 2020 (Online conference: Zoom)
3. Erosion brehavior of earth levee models treated with biopolymer hydrogel assessed with hydraulic flume apparatus, Special session 26 Part 1 Biogeotechnics Symposium: Lifecycle analysis and bio-mediated ground improvement, *ASCE Geo-Congress 2020*, Hyatt Regency Minneapolis, Minneapolis, MN, USA, February 27, 2020
4. Erosion brehavior of earth levee models treated with biopolymer hydrogel assessed with hydraulic flume apparatus, Grouting "Grouting verification from lab to field" session, *ASCE Geo-Congress 2020*, Hyatt Regency Minneapolis, Minneapolis, MN, USA, February 26, 2020
5. Upward wetting behavior of unsaturated Xanthan gum-treated sand, *2nd Pan-American Conference on Unsaturated Soils* (*PanAm-UNSAT 2017*), Intercontinental Dallas, Dallas, TX, USA, November 13, 2017.
6. Introduction of a new bio-based grouting material for underground hydraulic conductivity control, *World Tunnel Congress (WTC) 2017*, Grieg hall conference centre, Bergen, Norway, June 14, 2017.
7. A biogeotechnical engineering approach to combat desertification, *American Geophysical Union (AGU) Fall Meeting 2016*, Moscone Center, San Francisco, USA, December 15, 2016.
8. An environmentally-friendly geotechnical approach for soil erosion reduction using microbial biopolymers, *Geo-Chicago 2016*: *Sustainability, Energy, and the Geoenvironment,* Sheraton Grand Chicago, Chicago, Illinois, USA, August 17, 2016.
9. Soil hydraulic conductivity control via biopolymer treatment induced bio-clogging effect, *Geotechnical and Structural Engineering Congress 2016*, Phoenix Convention Center (PCC), Phoenix, Arizona, USA, February 16, 2016.
10. Biochemical soil treatment for erosion control against desertification, *The 16th European Conference on Soil Mechanics and Geotechnical Engineering* (ECSMGE), Edinburgh International Conference Center, Edinburgh, United Kingdom, September 14, 2015.
11. Micro and small strain geotechnical behaviors of Beta-glucan biopolymer treated soil, *The ASCE Geo-Congress 2014* (Geo-Atlanta), Westin Peachtree Plaza Hotel, Atlanta, Georgia, USA, February 24, 2014.
12. Durability improvement of earth walls using biopolymer treated Korean residual soil, *The 38th Australasian Universities Building Education (AUBEA) Conference 2013*, University of Auckland, Auckland, New Zealand, November 21st, 2013.
13. Water content dependency on the shear strength behavior of Gellan gum biopolymer treated soil, *The 3rd Korea-Japan Joint Workshop on Unsaturated Soils*, Yonsei University, Korea, November 1st, 2013.
14. Soil erosion control and vegetation stabilization using biogenic biopolymers, *The 5th International Young Geotechnical Engineers' Conference (5th iYGEC)*, Ecole des Ponts ParisTech, Paris, France, August 31st, 2013.
15. Environmentally-friendly seafloor treatment to prevent surface scouring, *EWEA (European Wind Energy Association) 2013 Conference*, Messe Wien, Vienna, Austria, February 5th, 2013.
16. Geophysical and geotechnical characterization of beta-1,3/1,6-glucan biopolymer treated soil, *American Geophysical Union (AGU) Fall Meeting 2012*, Moscone Center, San Francisco, USA, December 4th, 2012.
17. Sustainable soil treatment using environmentally-friendly biogenic by-products, *The International Joint Symposium on Urban Geotechnics for Sustainable Development (JS-Seoul 2012)*, Sungkyunkwan University, Suwon, Korea, November 2-3, 2012.
18. An alternative method for soil treatment using environmentally-friendly biopolymers, *The 2012 International Conference on Geomechanics and Engineering (ICGE12)*, COEX, Seoul, Korea, August 26-29, 2012.
19. A new alternative method for engineered soil using biogenic materials, *The Twenty-fourth KKCNN Symposium on Civil Engineering*, Iwaji International Conference Center, Hyogo, Japan, December 14-16, 2011.
20. Geotechnical Properties and Engineering Performance of Residual Soil Treated by Biogenic Biopolymers, *The Sixth KAIST-TJU Symposium on Civil Engineering*, KOCED GEO-centrifuge B/D, KAIST, Korea, August 1st, 2011.

21. Seismic Analysis of Concrete Rib-Reinforced Precast Arch cut-and-cover Tunnel, *The 21th KKCCN Symposium on Civil Engineering*, Furama Riverfront Hotel, Singapore, October 27th, 2008.
22. Estimation of In-situ Undrained Shear Strength of Soft Clays from Shear Wave Velocity, *2nd International Conference on Advanced Nondestructive Evaluation*, BEXCO, Busan, Korea, October 18th 2007.
23. Characterization of Reclaimed Clay using Shear Waves*, 1st SLGS International Conference on Soil and Rock Engineering*, Galadari Hotel, Colombo, Sri Lanka, August 8th, 2007.
24. A Laboratory Procedure to Characterize Reclaimed Clay Deposits using Shear Waves, *ASCE Geo-Denver 2007 Conference*, Adam's Mark Hotel, Denver, Colorado, February 19th, 2007.
25. Research of Geosystems Engineering Laboratory, *1st Tongji Univ.-KAIST Joint Symposium*, Tongji University, Shanghai, China, December 15th, 2006.
26. Characterization of Reclaimed Clay using Piezoelectric Bender Elements, *The 19th KKCNN Conference on Civil Engineering*, Kyoto University, Kyoto, Japan, December 10th 2006.
27. Characterization of the Consolidation process of Soft Clay using Shear Waves, *UiTM-KAIST Joint Symposium in Civil Engineering*, UiTM, Sha Alam, Malaysia, July 5th, 2006.
28. Characterization of Clay Sedimentation using Bender Element Sensors, *The 18th KKCNN Conference on Civil Engineering*, Embassador Hotel, Kaohsiung, December 20th 2005.
29. Characterization of Clay Sedimentation using Piezoelectric Bender Elements. *The 1st International Conference on Advanced Nondestructive Evaluation*, Jeju Convention Center, Jeju Island, Republic of Korea, November 7th 2005.

Domestic – Korea

1. 전단파속도를 이용한 해안점토의 비배수 전단강도 산정, 제 34 회 대한토목학회 정기 학술대회 2008, 대전컨벤션센터, 대전, 2008 년 10 월 30 일 (포스터발표).
2. 전단파를 이용한 매립 점토지반의 압밀상태 평가, 2006 한국지반공학회 준설매립기술위원회 학술발표회, 섬유센터빌딩, 서울, 2006 년 2 월 3 일.
3. 전단파를 이용한 준설매립 점토의 압밀 상태 및 강도 평가. 1st Workshop of YGEA, 경성대학교, 부산, 2006 년 1 월 20 일.

4.9. Other Scholarly Accomplishments

Development of a Specialized Testing Facility and Procedures

- Integrated soil hydraulic erosion assessment system including: Ultrasonic monitoring system equipped scour rate in cohesive soils-erosion function apparatus (SRICOS-EFA), Modified hole erosion apparatus (m-HEA), and open-channel hydraulic flume erosion (HFE; large and mini scales) to simulate surface and internal erosion conditions and assessing corresponding hydraulic erosion design parameters of soils
- State-of-art soil cyclic/dynamic research facility including resonant column (RC), cyclic simple shear (CSS), cyclic triaxial test, and 1-D uniaxial cyclic loading test apparatuses
- Micro-scale soil characterization scheme using advance liquid cell (LC) and microfluidic chip (MFC) microscopy, environmental scanning electron microscopy (ESEM), and transmission electron microscopy (TEM) methods
- Engineered (biopolymer-treated) soil durability assessment scheme including 1) cyclic wetting-drying, 2) cyclic freezing-thawing, and 3) furnace burning (i.e., thermal durability) experiments
- Dynamic rheology and strain-rate dependency considerations on the geotechnical engineering behaviors of biopolymer hydrogels and biopolymer-treated soil (BPTS) using Kinexus Pro rheometer, automatic shear testing machine (Shearmatic EmS), automatic computerized oedometer (ACE emS), and large shear testing machine (Shearmatic 300).
- Non-destructive elastic wave-based erosion monitoring system for the scour rate in cohesive soils-erosion function apparatus (SRICOS – EFA)
- Pressurized cell apparatus for soil hydraulic conductivity and injection performance assessment with specific features including 1) vertical confinement control, 2) intra-cell pore pressure control, 3) injection rate, and 4) intra-cell flow rate control, using pneumatic loading frame (10-kN, 50-mm stroke) and high pressure syringe pump (Teledyne ISCO 500D).
- Development of a multi-nozzle spraying system for biopolymer-soil spraying on slope surfaces and earth stabilization practices

- Development of the Korea Lunar regolith Simulant (KLS-1) and its automatic commercialization-scale production system
- Dedicated to experimental research of the elastic (compressive and shear) wave velocity-based characterization (design parameters including effective stress, degree of consolidation, density and undrained shear strength) of soft soil (e.g. reclaimed clay) and biopolymer-treated soil using piezoelectric sensors.

V. SERVICE

5.1. Professional Contributions

Membership – Professional and Research Societies

2019.01 - present	Nominated Member, TC105 (Geo-Mechanics from Micro to Macro), ISSMGE
2017.10 - present	Member, Australian Geomechanics Society (AGS)
2017.10 - present	Member (Professional Engineer), Engineers Australia (EA)
2015.11 - present	Corresponding Member, ISSMGE Young Members Presidential Group (YMPG)
2015.01 - present	Associate Member (#9728933), American Society of Civil Engineers (ASCE)
2013.11 – 2015.10	Member, ISSMGE Young Members Presidential Group (YMPG), nomination of the Asia region
2012.08 – present	Member, American Geophysical Union (AGU)
2012.07 – present	Member, Korea Tunneling and Underground Space Association (KTA)
2008.01 – present	Member, International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) (Membership code: KOR090017)
2007.01 – present	Member, Korean Society of Civil Engineers (KSCE)
2007.01 – present	Member, Korean Geotechnical Society (KGS)
2005.01 – present	Member, National Geographic Society

Technical Committees

International

2019.01– Present	*Nominated Member*, TC105 Geo-Mechanics from Micro to Macro, International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE).
2019.01 – Present	*Corresponding Member*, TC211 Ground Improvement, International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)

Domestic – Korea

2011.07 – 2012.06	Member, Research Theme Exploration Committee for Regional Development, Ministry of Land, Transport and Maritime Affairs (MLTMA), Korea.

Conference Organization and Session Chair

1. *Organizing Committee*, Member, *The KSCE 2021 Convention – Conference and Civil Expo*, October 20-22, 2021, Kimdaejung Convention Center, Gwangju, Republic of Korea
2. *Organizing Committee,* Member, *The 10th International Conference on Physical Modelling in Geotechnics 2022* (ICPMG2022), September 19-23, 2022, KAIST, Daejeon, Republic of Korea.
3. *Organizing Committee – Mini-symposium Organizer*, the 4th Symposium on "*Innovative Soil Treatment and Geotechnical Approaches 2020*", co-organized with Prof. Hideaki Yasuhara (Ehime Univ. Japan), as part of the 2020 International Conference on Geomechanics and Engineering (ICGE20), 2020 World Congress on Advances in Civil, Environmental and Materials Research (ACEM20), August 25-28, 2020, GECE Convention, Seoul National University, Seoul, Korea.
4. *Organizing Committee – Mini-symposium Organizer*, the 3rd Symposium on "*Innovative Soil Treatment and Geotechnical Approaches*", co-organized with Prof. Jian Chu (NTU, Singapore) and Prof. Hideaki Yasuhara (Ehime Univ. Japan), as part of the 2018 International Conference on Geomechanics and Engineering (ICGE18), 2018 World Congress on Advances in Civil, Environmental and Materials Research (ACEM18), August 27-29, 2018, Songdo Convensia, Incheon, Korea.
5. *Session Chair*. Session "(TC211) Ground improvement – Session 4" (September 21) in the 19th International Conference on Soil Mechanics and Geotechnical Engineering (19thICSMGE) 2017, September 17-22, COEX, Seoul, Korea.
6. *Session Chair*. Sessions "In-situ investigation and characterization" and "Slope stability (I)" (September 16), "Slope stability (II)" (September 17) in the 6th International Young Geotechnical Engineers' Conference (iYGEC6) 2017, September 16-17, GECE, Seoul National University, Seoul, Korea.

7. *Organizing Committee*. Member, The 19th International Conference on Soil Mechanics and Geotechnical Engineering (ICSMGE 2017), September 17-22, 2017, COEX, Seoul, Korea.
8. *Session Chair.* Sessions "M4C – Innovative / Eco-friendly Soil Treatment Technologies" (August 29), "T3C – Laboratory Experimental Testing" (August 30), and "W3C – Soil-structure Interactions from Micro to Macro" (August 31) in the 2016 International Conference on Geomechanics and Engineering (ICGE16) of the 2016 World Congress on Advances in Civil, Environmental, and Materials Research (ACEM16), August 29-31, 2016, ICC Jeju, Jeju, Korea.
9. *Organizing Committee – Mini-symposium Organizer*, Mini-symposium on "Innovative / Eco-friendly Soil Treatment Technologies (co-organized by Prof. Hideaki Yasuhara)" in the 2016 International Conference on Geomechanics and Engineering (ICGE16) of the 2016 World Congress on Advances in Civil, Environmental, and Materials Research (ACEM16), August 29-31, 2016, ICC Jeju, Jeju, Korea.
10. *International Technical Committee*. Member, The 38th Australasian Universities Building Education Association (AUBEA) Conference, November 20-22, 2013, University of Auckland, Auckland, New Zealand.
11. *Organizing Committee.* Member, The Korean Geotechnical Society 2013 Spring Conference, March 21-22, 2013, Youngnam University, Daegu, Korea.
12. *Local Organizing Committee*. Member, the 8th International Symposium on Geotechnical Aspects of Underground Construction in Soft Ground (IS-Seoul 2014), Seoul, Korea.
13. *Organizing Committee.* Member, The Korean Geotechnical Society 2012 Fall Conference, October 11-12, 2012, Seoul National University of Science and Technology, Seoul, Korea.
14. *Bidding Committee.* Division Coordinator, The 19th International Conference of Soil Mechanics and Geotechnical Engineering (ICSMGE), September 2017, COEX, Seoul, Korea
15. *Session Chair*, The 2012 World Congress on Advances in Civil, Environmental, and Materials Research (ACEM'12), session T5E-I "Bio- and Environmental Geomechanics and Engineering", August 28th, 2012, COEX, Seoul, Korea.
16. *Organizing Committee – Mini-symposium Organizer*, Mini-symposium on "Bio- and Environmental Geomechanics and Engineering" in the 2012 International Conference on Geomechanics and Engineering (ICGE12), August 26-29, 2012, COEX, Seoul, Korea.
17. *Local Organizing Committee*. Member, the 5th International Symposium on Deformation Characteristics of Geomaterials (IS-Seoul 2011), August 31-September 3, 2011, Sheraton Grande & W Seoul Walkerhill Hotel, Seoul, Korea.
18. *Organizing Committee*. Editorial Board, The 2nd KAIST-UiTM Symposium on Urban Engineering and Sustainability, March 30-April 1, 2008, KAIST, Daejeon, Korea.
19. *Organizing Committee*. Organizing Secretary, The 20th KKCNN Symposium on Civil Engineering, October 4-5, 2007, Seogwipo KAL Hotel, Jeju, Korea.

Editorial Board, Reviewer of Journal and Conference Articles

Editorial Board

1.	2019.01 – present	Associate Editor, *KSCE Journal of Civil Engineering* (SCIe journal; IF = 1.428), Korean Society of Civil Engineers, ISSN: 1226-7988
2.	2018.03 – present	Associate Editor, *Geomechanics and Engineering* (SCIe journal; IF = 2.594), Techno Press, ISSN: 2005-307X.
3.	2020.05 – present	Guest Editor, Special Issue "Geomechanics for Energy and a Sustainable Environment II", *Energies* (SCIe journal; IF = 2.707), MDPI, ISSN 1996-1073.
4.	2020.01 – present	Guest Editor, Special Issue "Advances in Geotechnical Engineering", *Applied Sciences* (SCIe journal; IF = 2.217), MDPI, ISSN 2076-3417.
5.	2018.09 – 2020.01	Guest Editor, Special Issue "Geomechanics for Energy and a Sustainable Environment", *Energies* (SCIe journal; IF = 2.707), MDPI, ISSN 1996-1073.
6.	2016.09 – 2017.05	Guest Editor, Special Issue "Innovative and eco-friendly soil treatment technologies", *Geomechanics and Engineering* (SCIe journal; IF = 1.818), Techno Press, ISSN: 2005-307X.
7.	2014.01 – 2016.12	Editorial Board member, *Journal of Korean Tunneling and Underground Space Association*, Korean Tunneling and Underground Space Association, ISSN: 2233-8292.
8.	2014.01 – 2016.12	Editorial Board member, Korean Society of Civil Engineers (KSCE) Magazine (in Korean), Korean Society of Civil Engineers.
9.	2013.04 – 2017.03	Editorial Board member, KGS Magazine (in Korean), Korean Geotechnical Society (KGS).
10.	2012.07 – 2017.12	Editorial Board member, Korean Tunneling and Underground Space Association Magazine

(in Korean), Korean Tunneling and Underground Space Association.

11. 2012.01 – 2016.12 Editorial Board member, KGS Newsletter (in English), Korean Geotechnical Society.

Reviewer

1. 2018.12 – present Reviewer, *Journal of Materials in Civil Engineering* (SCIe journal; IF = 1.763), American Society of Civil Engineers (ASCE), ISSN: 0899-1561.
2. 2018.09 – present Reviewer, *Catena* (SCI journal; IF = 3.256), Elsevier, ISSN: 0341-8162.
3. 2018.08 – present Reviewer, *Soils and Foundation*s (SCIe journal; IF = 1.599), Elsevier, ISSN: 0038-0806.
4. 2017.09 – present Reviewer, *Construction and Building Materials* (SCIe journal; IF = 3.485), Elsevier, ISSN: 0950-0618.
5. 2018.01 – present Reviewer, *Journal of Geotechnical and Geoenvironmental Engineering* (SCI journal IF = 3.305), American Society of Civil Engineers (ASCE), ISSN: 1090-0241.
6. 2017.07 – present Reviewer, *Scientific Reports* (SCI journal; IF = 4.259), Nature Publishing Group, ISSN: 2045-2322.
7. 2017.06 – present Reviewer, *Journal of Aerospace Engineering* (SCIe journal; IF = 1.107), ASCE, ISSN: 0893-1321.
8. 2014.10 – present Reviewer, *International Journal of Geo-Engineering*, Springer, ISSN: 2092-9196
9. 2014.01 – present Reviewer, *Korea Geotechnical Society Journal*, Korea Geotechnical Society, ISSN: 1229-2427.
10. 2014.01 – present Reviewer, *Geomechanics and Engineering* (SCIe-journal; IF = 1.818), Techno Press, ISSN: 2005-307X
11. 2013.06 – present Reviewer, *Journal of Hazardous Materials* (SCI-journal; IF = 6.065), Elsevier, ISSN: 0304-3894
12. 2013.05 – present Reviewer, *Journal of Material Cycles and Waste Management* (SCIe-journal; IF = 1.604), Springer, ISSN: 1438-4957
13. 2010.09 – present Reviewer, *KSCE Journal of Civil Engineering* (SCIe-journal; IF = 0.940), Korean Society of Civil Engineers, Springer, ISSN: 1226-7988 (print version); 1976-3808 (electronic version).

5.2. Campus Contributions

2021.04 – present *Admission Officer*, Ajou University, Republic of Korea

2020.10 – present Member, *Convergence Research Council*, School of Engineering, Ajou University, Republic of Korea

2019.01 – 2020.06 Member*, Teaching Support Team* (TST), School of Engineering and Information Technology (SEIT), University of New South Wales, Canberra, Australia.

2017.06 – 2020.08 *Coordinator (Chair) of Facilities*, Facilities Leadership Group (FLG), School of Engineering and Information Technology (SEIT), University of New South Wales, Canberra, Australia

2020.02 – 2020.08 *Chair*, Sustainable Engineering – Group B, Final Year Project (FYP), School of Engineering and Information Technology (SEIT), University of New South Wales, Canberra, Australia

2020.01.13~15 Activity Lead / Instructor of Earthen Dam (Civil Engineering) Program, 2020 *Young Women in Engineering* (*YoWIE*) Summer School, January 13-15, 2020, School of Engineering and Information Technology, University of New South Wales, Canberra, Australia

2019.01.16~18 Activity Lead / Instructor of Earth (Civil Engineering) Program, 2019 *Young Women in Engineering* (*YoWIE*) Summer School, January 16-18, 2019, School of Engineering and Information Technology, University of New South Wales, Canberra, Australia

2010.11.26 Admissions Officer, Office of Undergraduate Admissions, KAIST.

2006.03 – 2008.02 Member, Committee of the Graduate Student Association, KAIST.

2007.11 – 2008.02 KAIST 2008 Commencement Committee

2007.04 – 2008.02 President, 35th Graduate Student Association, KAIST.

2005.03 – 2008.02 Representative of the students' body of the Dept. of Civil and Environmental Engineering, KAIST.

5.3. Public Services and Other Activities

2021.06.26 – 2023.06.25 *Member,* Technical Advisory Committee (Rivers), Gyeonggi Provincial Government (경기도 지방하천 기술자문위원회)

2021.01.01 – 2021.12.31 *Member.* Technical Advisory Committee, K-Water, Daejeon, Republic of Korea (한국수자원공사 용역제안서 평가위원(토목시공분야))

2020.12.16 – 2021.12.31	*Member*. Technical Advisory Committee, Goyang-si, Gyeonggi-do, Republic of Korea (고양시 기술자문위원회 위원)
2020.10.01 – 2022.09.30	*Member* for Electrical Civil Engineering, Korea Electric Power Corporation (KEPCO) (한국전력공사 전력토목분야 기술자문 및 심의위원)
2014.03.02–03.06	Member, Overseas Construction Order Supporting Group (Head: Minister of the Ministry of Land, Infrastructure, and Transport (MLIT)) in Malaysia, Myanmar
2009.02.19–03.19	Captain trainee, 2nd company, 28th regiment, Korea Army Training Center, Nonsan, Korea.
2007.06.11–16	In the suite of President Suh, Nam Pyo (KAIST) on the visit and MOU agreement in Technion, Israel

VI. GRANTS AND CONTRACTS

6.1 Successful Research Funding

Current

1. ***Biopolymer-based soil treatment (BPST) for post-wildfire site erosion control and recovery promotion***
   Amount: 60,000,000 KRW Role: Chief Investigator
   Period: 2020.10 ~2023.09 Source: Ajou University
   This project aims to apply biopolymer-based soil treatment technology to mitigate surface soil erosion of wildfire burnt sites and promote the site recovery

2. ***Feasibility study for the development of a new bio-based excavation slurry***
   Amount: $173,500 AUD Role: Chief Investigator UNSW RG191459
   Period: 2019.04 ~2021.12 Source: Korea Electric Power Corporation (KEPCO)
   This project aims to investigate a new bio-based (biopolymer) slurry material to substitute the usage of common bentonite-type slurries in civil engineering practices with chemical dynamic rheology and soil mechanics perspectives.

Past

3. ***Cyclic simple shear (CSS) test equipment purchase***
   Amount: $108,192 AUD Role: Chief Investigator UNSW RG193875
   Period: 2020.01 ~2020.12 Source: University of New South Wales (UNSW) Research Infrastructure Scheme (RIS) 2020
   This project aims to setup a new cyclic simple shear (CSS) equipment to enhance the research capability of UNSW Canberra.

4. ***Microscale characterization and coupling model development of biopolymer-cemented particulate medium***
   Amount: $50,000 AUD Role: Chief Investigator UNSW PS51230
   Period: 2019.01 ~2020.12 Source: University of New South Wales (UNSW) Special Research Grants (SRG) Program
   This project aims to characterize the bonding and cementation behaviors of biopolymer hydrogel treated particulate materials with microfluidic chip microscopy and geotechnical engineering laboratory tests.

5. ***Rapid improvement of levee structures using bio-materials***
   Amount: $350,000 AUD (341,000,000 KRW) Role: Chief Investigator UNSW RG172106
   Period: 2017.04 ~ 2021.06 Source: Korea Agency for Infrastructure Technology Advancement (KAIA), Ministry of Land, Infrastructure and Transport (MOLIT)
   This project will develop a rapid improvement material and application method to repair or improve levee structures. As piping (internal erosion) becomes a critical concern, I am performing laboratory studies on the hydraulic conductivity of biopolymer-soil mixtures. A real test-bed application is scheduled for December 2017 to evaluate the erosion behavior of 1/5 scale levee models.

6. ***Development of non-cement biopolymer-based rapid improvement method for vertical tunnel excavation***
   Amount: $140,000 AUD (110,000,000 KRW) Role: Chief Investigator UNSW RG172070
   Period: 2017.05 ~2020.06 Source: Korea Agency for Infrastructure Technology Advancement (KAIA), Ministry of Land, Infrastructure and Transport (MOLIT)
   This project aims to develop a new bio-based grouting material to substitute the use of ordinary cement. The first term of research began this year, and the project will be funded until 2020.

7. ***Development of new bio-based material for high strength, environmentally-friendly embankment construction***
   Amount: 80,000,000 KRW Role: Principle Investigator 16AWMP-B114119-01

Period: 2016.06 ~ 2017.02 Source: Korea Agency for Infrastructure Technology Advancement (KAIA), Ministry of Land, Infrastructure and Transport (MOLIT)

This project developed a new bio-based material for earth levee construction. During the first year, I performed feasibility laboratory testing of the erosion behaviour of soils with different treatment conditions using the erosion function apparatus at the KICT, and in the second year, research resumed at the UNSW Canberra, due to my move to Australia.

8. ***Development of an "All-in-one" countermeasure solution for desertification***
Amount: 188,000,000 KRW Role: Chief Investigator 2015R1A2A2A03006268
Period: 2015.05~2017.02 Source: National Research Foundation (NRF) of Korea, Ministry of Science, ICT and Future Planning (MSIP)

This project aimed to develop a new soil treatment method using multi-disciplinary approaches, and bio-based materials were used to enhance soil erosion resistance.

9. ***Geotechnical engineering preparations for lunar exploration: Soil mechanics with lunar soil and laboratory demonstration of lunar environments***
Amount: 931,000,000 KRW Role: Chief Investigator 20150217-001-01
Period: 2014.01~2016.12 Source: Ministry of Science, ICT, and Future Planning (MSIP)

This research was a special project to develop Korea's own lunar regolith simulant to be used for various nationwide lunar studies. My research team and I discovered the most appropriate raw material based on a series of site surveys, sampling and XRD and XRF analyses. The first lunar regolith simulant (i.e., KLS-1) was developed and has been used in 4 national research programs in Korea. The KLS-1 production method is secured by a registered patent, and scientific behaviors of the simulant were verified by a recently published international journal paper.

10. ***Development of new construction materials for underground excavation efficiency improvement***
Amount: 771,050,000 KRW Role: Principle Investigator 20150216-001-01
Period: 2013.01~2016.12 Source: Ministry of Science, ICT, and Future Planning (MSIP)

This project aimed to develop an environmentally-friendly method to treat excavated soils using new materials. I developed a rapid excavation soil stabilization and utilization method using xanthan gum. Moreover, a new grouting material has been introduced using micro cement and a biopolymer additive.

11. ***Development of a high-water erosion resistance soil mixture***
Amount: 363,000,000 KRW Role: Chief Investigator 20120454-1-1 & 20140094-001-01
Period: 2012.01~2014.12 Source: Korea Institute of Construction Technology (KICT) Ministry of Knowledge and Economy, Korea

In this seed project, preliminary studies were performed to investigate a new material to improve the wet (saturated) strength of soils. I found a biopolymer material with thermo-gelation characteristics to treat soils, and successfully enhanced the unconfined compressive strength of saturated clays up to 500 kPa. Results have been published in two international journal papers.

12. ***Development of fundamental technology for anti-desertification using low-carbon emitting biopolymers***
Amount: 168,198,000 KRW Role: Chief Investigator 2012R1A1A2007002
Period: 2012.05~2015.04 Source: National Research Foundation (NRF) of Korea Basic Research – General Researcher Program

This project investigated a new biopolymer material for soil treatment to improve the strength of soils. Most studies were based on laboratory programs, including rheological property evaluation, basic soil laboratory tests (i.e., Atterberg limits, vane shear, unconfined compression and direct shear tests). I discovered the hydrogen bonding characteristic between fine particles and biopolymers, which governs the physical behavior of biopolymer-treated soils.

13. ***Evaluation of the Overly Consolidated State of Coastal Clay***
Amount: 11,000,000 KRW Role: Project Manager KAIST GK01740
Period: 2004.09~2005.12 Source: KAIST – Kim Bo-Jung Fundamental Science Scholarship Foundation

6.2 Pending (Applied for Funding)

VII. HONORS AND AWARDS

2020.09.25 **Excellent Paper Award** ("Erosion characteristics of biopolymer treated river sediment sands") for the Korean Geotechnical Society (KGS) 2020 Fall e-Conference, September 24-25, 2020.

2019.04.02 **Excellent Paper Award** ("Erosion resistance of xanthan gum biopolymer treated soils") for the Korean Geotechnical Society (KGS) 2019 Spring Conference, Managing the Science and Technology Center, Seoul, Korea, March 14-15, 2019.

2016.04.11 **Excellent Paper Award** ("Soil resistance increment caused by microbial biopolymer") for the Korean Geotechnical Society (KGS) 2016 Spring Conference, Managing the Science and Technology Center, Seoul, Korea, March 17th, 2016.

2016.04.11 **Excellent Paper Award** ("Microbial biopolymer effects on the shear behavior of cohesionless Sand") for the Korean Geotechnical Society (KGS) 2016 Spring Conference, Managing the Science and Technology Center, Seoul, Korea, March 17th, 2016.

2015.12.30 **Outstanding Researcher Award** for excellent performances using Research Notes, Korea Intellectual Property Strategy Institute (KISTA), Seoul, Korea

2015.04.13 **Excellent Paper Award** for the Korean Geotechnical Society (KGS) 2015 Spring Conference, Managing the Science and Technology Center, Seoul, Korea, March 20th, 2015.

2014.04.11 **Excellent Paper Award** for the Korean Geotechnical Society (KGS) 2014 Spring Conference, Managing the Science and Technology Center, Seoul, Korea, March 22nd, 2014.

2013.03.21 **Young Member Award** of the Korean Geotechnical Society, Korean Geotechnical Society (KGS), Youngnam University, Korea, March 21st, 2013.

2012.12.31 **Excellent New Researcher Award** as the winner of the "No Fear" program, Korea Institute of Civil Engineering and Building Technology (KICT), Korea.

2012.10.15 **Korean Nominee and Travel Funds** for the 5th International Young Geotechnical Engineer Conference (5th iYGEC) during the 18th International Conference on Soil Mechanics and Geotechnical Engineering (ICSMGE), Paris, France, August 2013.

2009.03.19 **Exemplary Trainee Award**, the 28th training regiment, Korea Army Training Center, Korea.

2008.11.01 **Included in "Who's Who in the World"**, Marquis (November 2008) 26th Edition.

2007.11.01 **Included in "Who's Who in the World"**, Marquis (November 2007) 25th Edition.

2005.12.20 **KKCNN Adachi Award for Outstanding Young Researcher**, 18th KKCNN Symposium on Civil Engineering, Taiwan.

2004.09.13 **Kim, Bo-Jung Fundamental Science Scholarship** (Research Fund 20,000,000 Won), KAIST, Korea.

2000.03.02 **Excellent Freshmen Scholarship** (U.C Berkeley summer session visiting, June-August 2001), KAIST, Korea.

1999.06.30 **Gold Award**, Earth Science Olympiad, Chung-buk office of Education, Korea.

I hereby declare all information and outputs listed in this document are true and stated by myself.

August 11, 2021
Dr. Ilhan Chang
Associate Professor, Department of Civil Systems Engineering
Ajou University, Republic of Korea

APPENDICES

Teaching Assessment: Statistic Comparison

UNSW MyExperience Survey