

Sang-Yeop Chung

Associate Professor, Ph.D.
Department of Civil and Environmental Engineering
Yonsei University, Seoul, Republic of Korea

Office: N511, Engineering Building 1, 50 Yonsei-ro, Seodaemun-gu, Seoul 03722, Republic of Korea
Telephone: +82-(0)2-2123-5781
Mobile: +82-(0)10-2766-7056
E-mail: sychung@yonsei.ac.kr

■ Education

2009.03-2013.08	Ph.D.	Department of Civil and Environmental Engineering, (Structural Engineering major), Yonsei University (advisor: Prof. Tong-Seok Han)
2007.09-2009.02	M.S.	Department of Civil and Environmental Engineering, Yonsei University (advisor: Prof. Tong-Seok Han)
2004.04-2007.08	B.S.	Department of Civil and Environmental Engineering, Yonsei University

■ Professional Experiences

2023.03-Current	Associate Professor in the Department of Civil and Environmental Engineering at Yonsei University (Seoul, Rep. of Korea)
2022.09-2023.02	Associate Professor in the Department of Civil and Environmental Engineering at Sejong University (Seoul, Rep. of Korea) * Head of Department (2021.09-2023.02)
2019.03-2022.08	Assistant Professor in the Department of Civil and Environmental Engineering at Sejong University (Seoul, Rep. of Korea)
2014.12-2019.02	Postdoctoral research assistant at Technische Universität Berlin (Berlin, Germany)
2013.09-2014.11	Postdoctoral research assistant at Yonsei University (Seoul, Rep. of Korea)

■ Research Interests

- Multi-scale analysis of infrastructures
- Numerical analysis of high-performance structures
- Material characterization and property evaluation (concrete materials, polycrystalline solids)
- Development of multifunctional construction materials
- Application of artificial intelligent for infrastructures

■ Awards & Honors

2021	Best presentation award in the annual conference of Korea Concrete Institute (KCI)
2016-2017	National Research Foundation of Korea (NRF) Funding by Basic Science Research Program for Postdoctoral Researcher

2015-2016	German Academic Exchange Service (DAAD) Postdoctoral Scholarship
2013	Korean Society of Civil Engineers (KSCE) Conference Award
2013	Korean Society of Civil Engineers (KSCE) Ph.D. Dissertation Award
2009	National Research Scholarship (Rep. of Korea)
2007-2008	Graduate School Scholarships (Yonsei University)
2007	Award for Academic Achievement (Yonsei University)
2004-2007	National Science & Technology Scholarship (Rep. of Korea)

■ Thesis

- Ph.D. Probabilistic characterization of phase distributions and methodologies to correlate with material properties (Yonsei University, 2013)
- M.S. Study on a reconstruction method of anisotropic two-phase microstructures using correlation functions and analysis of mechanical behaviors of reconstructed samples (Yonsei University, 2009)

■ Publications

1. International Journal Papers

- [72] Seo-Eun Oh, Ji-Su Kim, Sung-Kyu Maeng, Seungdae Oh, **Sang-Yeop Chung***, Kyuwon Kim, Soo-Ho Han (2024) Influence of bacterial biomineralization conditions on the microstructural characteristics of cement mortar, *Journal of Building Engineering*, accepted.
- [71] Hyeonjong Lee, **Sang-Yeop Chung***, Hong-Keun Hyun, Ju Ri Ye, Yuwon Jeong, Seo-Eun Oh, and Ok Hyung Nam (2024) Influence of post-printing cleaning methods for 3D-printed resins on cleaning efficiency, surface and mechanical properties, *The Journal of Prosthetic Dentistry*, accepted.
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- [70] Syzmon Skibicki, Piotr Szewczyk, Julia Majewska, Daniel Sibera, Ewa Ekiert, **Sang-Yeop Chung***, and Pawel Sikora (2024) The effect of interlayer adhesion on stress distribution in 3D printed beam elements, *Journal of Building Engineering*, 87, 109093.
- [69] **Sang-Yeop Chung** and Ji-Su Kim (2024) Effect of microstructural gradient on mechanical properties at interfacial transition zones in mortar via micro-CT analysis, *Developments in the Built Environment*, 18, 100390.
- [68] Seo-Eun Oh, **Sang-Yeop Chung***, Kyuwon Kim, Soo-Ho Han (2024) Comparative analysis of the effects of waste shell aggregates on the material properties of cement mortars, *Construction and Building Materials*, 412, 134887.
- [67] Seon-Won Yoon, Sang-Yeob Kim, Joon-Seong Jeon, Seungdae Oh, **Sang-Yeop Chung**, Ji-Su Kim, Sung-Kyu Maeng (2024) 3D-printed *Chlorella vulgaris* biocarriers: A novel approach to wastewater treatment, *Journal of Water Process Engineering*, 57, 1004711.
- [66] Yazeed Al-Noaimat, Mehdi Chougan, Abdulrahman Albar, Szymon Skibicki, Karol Federowicz, Marcin Hoffman, Daniel Sibera; Krzysztof Cendrowski, Mateusz Techman, João Nuno Pacheco, **Sang-Yeop Chung**, Seyed Hamidreza Ghaffar (2023) 3D printing of one-part alkali-activated materials containing brick powder and aggregates: An investigation into fresh, hardened and printing properties, *Developments in the Built Environment*, 16, 100248.
- [65] Pawel Sikora, Levent Afsar, Sundar Rathnarajan, Morteza Nikravan, **Sang-Yeop Chung**, Dietmar Stephan, and Mohamed Abd Elrahman (2023) Seawater-mixed Lightweight Aggregate Concretes with Dune Sand, Waste Glass and Nanosilica: Experimental and Life Cycle Analysis,

International Journal of Concrete Structures and Materials, 17, 47.

- [64] Karol Federowicz, Mateusz Techman, Szymon Skibicki, Mehdi Chougan, Ahmed M. El-Khayatt, H. A. Saudi, Jarosław Błyszko, Mohamed Abd Elrahman, **Sang-Yeop Chung***, and Pawel Sikora (2023) Development of 3D printed heavyweight concrete (3DPHWC) containing magnetite aggregate, *Materials and Design*, 233, 112246.
- [63] Thi Huyen Duong, Sang-Yeob Kim, **Sang-Yeop Chung**, Heejong Son, Seungdae Oh, and Sung Kyu Maeng (2023) Biomass formation and organic carbon migration potential of microplastics from a PET recycling plant: Implication of biostability, *Journal of Hazardous Materials*, 455, 131645.
- [62] **Sang-Yeop Chung***, Seo-Eun Oh, Su-Sung Jo, Christian Lehmann, Jonghwa Won, and Mohamed Abd Elrahman (2023) Microstructural characteristics of cement mortars incorporating cockle shell aggregates and waste fishing net fibers, *Case Studies in Construction Materials*, 18, e01719.
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- [61] Seon Yeol Lee, Nguyen Van Thong, **Sang-Yeop Chung**, Jae-Heum Moon, and Dong Joo Kim (2023) Hydration simulation of cement pastes reinforced with carbon nanotubes, *Construction and Building Materials*, 384, 131333.
- [60] Nguyen Van Thong, Seon Yeol Lee, **Sang-Yeop Chung**, Jae-Heum Moon, and Dong Joo Kim (2023) Use of multiphase voxels to simulate the effects of nano-silica on cement hydration, *Case Studies in Construction Materials*, e01909.
- [59] Pawel Sikora, Ahmed M. El-Khayatt, H.A. Saudi, Maxime Liard, Didier Lootens, **Sang-Yeop Chung***, Paweł Woliński, and Mohamed Abd Elrahman (2023) Rheological, mechanical, microstructural and radiation shielding properties of cement pastes containing magnetite (Fe₃O₄) nanoparticles, *International Journal of Concrete Structures and Materials*, 17(1), 7.
- [58] **Sang-Yeop Chung**, Hyeonjong Lee, Su-Sung Jo, Yong Kwon Chae, Ok Hyung Nam (2022) Stress distribution of paediatric zirconia crowns depending on different tooth preparation and cement type: a finite element analysis, *BMC Oral Health*, 22, 550.
- [57] Pawel Sikora, Mateusz Techman, Karol Federowicz, Ahmed M. El-Khayatt, H. A. Saudi, Mohamed Abd Elrahman, Marcin Hoffmann, Dietmar Stephan, and **Sang-Yeop Chung*** (2022) Insight into microstructural and radiation shielding characteristics of 3D printed concrete: casted versus printed specimens, *Case Studies in Construction Materials*, 17, e01320.
- [56] Seungdae Oh, Youngjun Kim, Donggeon Choi, Ji Won Park, Jin Hyung Noh, **Sang-Yeop Chung**, Sung Kyu Maeng, Chang-Jun Cha (2022) Effects of biochar addition on the fate of ciprofloxacin and its associated antibiotic tolerance in an activated sludge microbiome, *Environmental Pollution*, 306, 119407.
- [55] Yoonjae Shin, Hyeong Min Park, Jinho Bang, Hongdong Cho, Seo-Eun Oh, **Sang-Yeop Chung***, Beomjoo Yang (2022) Effect of polymer binder on the mechanical and microstructural properties of pervious pavement materials, *Construction and Building Materials*, 325, 126209.
- [54] **Sang-Yeop Chung**, Ji-Su Kim, Tong-Seok Han, Dietmar Stephan, and Mohamed Abd Elrahman (2022) Characterization of foamed concrete with different additives using multi-scale micro-computed tomography, *Construction and Building Materials*, 319, 125953.
- [53] **Sang-Yeop Chung**, Yun Hyeong Kim, Ok Hyung Nam, Yong Kwon Chae, Su-Sung Jo, and Sung Chul Choi (2021) Void characteristics and tortuosity of calcium silicate-based cements for regenerative endodontics: a micro-computed tomography analysis, *BMC Oral Health*, 21, 565.
- [52] Maria Tunkiewicz, Joanna Misiewicz, Pawel Sikora, and **Sang-Yeop Chung*** (2021) Hygric properties of machine-made, historic clay bricks from north-eastern Poland (former East Prussia): characterization and specification for replacement materials, *Materials*, 14, 6706.

- [51] Van Thong Nguyen, Seon Yeol Lee, **Sang-Yeop Chung**, Jae-Heum Moon, and Dong Joo Kim (2021) Effects of cement particle distribution on the hydration process of cement paste in three-dimensional computer simulation, *Construction and Building Materials*, 311, 125322.
- [50] **Sang-Yeop Chung**, Ji-Su Kim, Mohamed Abd Elrahman, Paul H. Kamm, Dietmar Stephan, and Tong-Seok Han (2021) Investigation of interfacial transition zone (ITZ) of mortar using micro-computed tomography, *Journal of Materials in Civil Engineering*, 33(12), 04021348.
- [49] Hongdong Cho, Hongsu Bae, Chanhoo Park, Hyeong Min Park, Seo-Eun Oh, **Sang-Yeop Chung***, Beomjoo Yang (2021) Mechanical and microscopic characteristics of polyurethane-based pervious pavement composites, *Materials*, 14, 4365.
- [48] Huy Viet Le, Min Kyoung Kim, Seon Uk Kim, **Sang-Yeop Chung**, and Dong Joo Kim (2021) Enhancing self-stress sensing ability of smart ultra-high performance concretes under compression by using nano functional fillers, *Journal of Building Engineering*, 44, 102717.
- [47] Mohamed Abd Elrahman, Pawel Sikora, **Sang-Yeop Chung***, and Dietmar Stephan (2021) The performance of ultra-lightweight foamed concrete incorporating nanosilica, *Archives of Civil and Mechanical Engineering*, 21, 79.
- [46] Pawel Sikora, Ahmed M. El-Khayatt, Heba A. Saudi, **Sang-Yeop Chung**, Dietmar Stephan, and Mohamed Abd Elrahman (2021) Evaluation of the effects of bismuth oxide (Bi_2O_3) micro and nanoparticles on the mechanical, microstructural and r-ray / neutron shielding properties of Portland cement pastes, *Construction and Building Materials*, 284, 122758.
- [45] Jarosław Strzalkowski, Pawel Sikora, **Sang-Yeop Chung**, and Mohamed Abd Elrahman (2021) Thermal performance of building envelopes with structural layers of the same density: Lightweight aggregate concrete versus foamed concrete, *Building and Environment*, 196, 107799.
- [44] Mehdi Chougan, Seyed Hamidreza Ghaffar, Pawel Sikora, **Sang-Yeop Chung**, Teresa Rucinska, Dietmar Stephan, Abdulrahman Albar, Mohmamad Rafiq Swash (2021) Investigation of additive incorporation on rheological, microstructural and mechanical properties of 3D printable alkali-activated materials, *Materials and Design*, 202, 109574.
- [43] Pawel Sikora, **Sang-Yeop Chung***, Maxime Liard, Didier Lootens, Tobias Dorn, Paul H. Kamm, Dietmar Stephan, and Mohamed Abd Elrahman (2021) The effects of nanosilica on the fresh and hardened properties of 3D printable mortars, *Construction and Building Materials*, 281, 122574.
- [42] **Sang-Yeop Chung**, Pawel Sikora, Dong Joo Kim, Mohamed E. El Madawy, and Mohamed Abd Elrahman (2021) Effect of different expanded aggregates on durability-related characteristics of lightweight aggregate concrete, *Materials Characterization*, 173, 110907.
- [41] Pawel Sikora, Teresa Rucinska, Dietmar Stephan, **Sang-Yeop Chung*** and Mohamed Abd Elrahman (2020) Evaluating the effects of nanosilica on the material properties of lightweight and ultra-lightweight concrete using image-based approaches, *Construction and Building Materials*, 264, 120241.
- [40] Dae-Young Kim, Pawel Sikora, Krystyna Araszkiewicz, and **Sang-Yeop Chung*** (2020) Inverse estimation method of material randomness using observation, *Crystals*, 10, 23.
- [39] Ji-Su Kim, **Sang-Yeop Chung**, Tong-Seok Han, Dietmar Stephan, and Mohamed Abd Elrahman (2020) Correlation between microstructural characteristics from micro-CT of foamed concrete and mechanical behaviors evaluated by experiments and simulations, *Cement and Concrete Composites*, 112, 103657.
- [38] **Sang-Yeop Chung**, Pawel Sikora, Dietmar Stephan, and Mohamed Abd Elrahman (2020) The effect of lightweight concrete cores on the thermal performance of vacuum insulation panels, *Materials*, 13, 2632.
- [37] Ji-Su Kim, **Sang-Yeop Chung**, Dietmar Stephan, Tong-Seok Han, and Mohamed Abd Elrahman (2020) Modeling of multiple phase solid microstructures and prediction of mechanical behaviors

of foamed concrete, *Construction and Building Materials*, 248, 118637.

- [36] **Sang-Yeop Chung**, Ji-Su Kim, Christian Lehmann, Dietmar Stephan, Tong-Seok Han, and Mohamed Abd Elrahman (2020) Investigation of phase composition and microstructure of foamed cement paste with different supplementary cementing materials, *Cement and Concrete Composites*, 109, 103560.
- [35] **Sang-Yeop Chung**, Pawel Sikora, Teresa Rucinska, Dietmar Stephan, and Mohamed Abd Elrahman (2020) Comparison of the pore size distributions of concretes with different air-entraining admixture dosages using 2D and 3D imaging approaches, *Materials Characterization*, 162, 110182.
- [34] Mohamed Abd Elrahman, Mhamed E. El Madawy, **Sang-Yeop Chung***, Stanislaw Majer, Osama Youssf, and Pawel Sikora (2020) An investigation of the mechanical and physical characteristics of cement paste incorporating different air entraining agents using X-ray micro-computed tomography, *Crystals*, 10, 23.
- [33] Mohamed Abd Elrahman, **Sang-Yeop Chung**, Pawel Sikora, Teresa Rucinska, and Dietmar Stephan (2019) Influence of nanosilica on mechanical properties, sorptivity, and microstructure of lightweight concrete, *Materials*, 12, pp. 3078.
- [32] **Sang-Yeop Chung**, Ji-Su Kim, Dietmar Stephan, and Tong-Seok Han (2019) Overview of the use of micro-computed tomography (micro-CT) to investigate the relation between the material characteristics and properties of cementitious materials, *Construction and Building Materials*, 229, pp. 116843.
- [31] Mohamed Abd Elrahman, Mohamed El Madawy, **Sang-Yeop Chung***, Pawel Sikora, and Dietmar Stephan (2019) Preparation and Characterization of Ultra-Lightweight Foamed Concrete Incorporating Lightweight Aggregates, *Applied Sciences*, 9, 1447.
- [30] **Sang-Yeop Chung**, Mohamed Abd Elrahman, Ji-Su Kim, Tong-Seok Han, Dietmar Stephan, and Pawel Sikora (2019) Comparison of lightweight aggregate concrete and foamed concrete with the same density level using image-based characterizations, *Construction and Building Materials*, 211, p. 988-999.
- [29] Ji-Su Kim, **Sang-Yeop Chung**, Dietmar Stephan, and Tong-Seok Han (2019) Issues on microstructure characterization and evaluation of mechanical properties of virtual cement paste specimens from micro-CT, *Construction and Building Materials*, 202, pp. 82-102.
- [28] Pawel Sikora, Krzysztof Cendrowski, Mohamed Abd Elrahman, **Sang-Yeop Chung**, Ewa Mikowska, and Dietmar Stephan (2019), The effects of seawater on the hydration, microstructure and strength development of Portland cement pastes incorporated with colloidal silica, *Applied Nanoscience*, 3, pp. 1-12.
- [27] Pawel Sikora, Mohamed Abd Elrahman, **Sang-Yeop Chung**, Krzysztof Cendrowski, Ewa Mikowska, and Dietmar Stephan (2019), Mechanical and microstructural properties of cement pastes containing carbon nanotubes and carbon nanotube-silica core-shell structures, exposed to elevated temperature, *Cement and Concrete Composites*, 95, pp. 193-204.
- [26] Mohamed Abd Elrahman, **Sang-Yeop Chung***, and Dietmar Stephan (2019) Effect of different expanded aggregates on the properties of lightweight concrete, *Magazine of Concrete Research*, 71, pp. 95-107.
- [25] **Sang-Yeop Chung**, Mohamed Abd Elrahman, Dietmar Stephan, and Paul H. Kamm (2018) The influence of different concrete additions on the properties of lightweight concrete evaluated using experimental and numerical approaches, *Construction and Building Materials*, 189, pp. 314-322.
- [24] Feras Tajra, Mohamed Abd Elrahman, **Sang-Yeop Chung**, and Dietmar Stephan (2018) Performance assessment of core-shell structured lightweight aggregate produced by cold bonding palletization process, *Construction and Building Materials*, 179, pp. 220-231.

- [23] **Sang-Yeop Chung**, Christian Lehmann, Mohamed Abd Elrahman, and Dietmar Stephan (2018) Microstructural characterization of foamed concrete with different densities using microscopic techniques, *Cement Wapno Beton*, 3, pp. 216-225.
- [22] Tong-Seok Han, **Sang-Yeop Chung**, and Ji-Su Kim (2018) Investigation of mechanical properties and microstructure of cement paste with glass beads using crack phase field model and lineal-path function, *Cement Wapno Beton*, 3, pp. 239-250.
- [21] **Sang-Yeop Chung**, Mohamed Abd Elrahmann, and Dietmar Stephan (2018) Effects of expanded polystyrene (EPS) sizes and distributions on the material properties of lightweight concrete, *Materials and Structures*, 57, pp. 1-11.
- [20] Tong-Seok Han, Xiaoxuan Zhang, Ji-Su Kim, **Sang-Yeop Chung**, Jae-Hong Lim, and Christian Linder (2018) Area of lineal-path function for describing the pore microstructures of cement paste and their relations to the mechanical properties simulated from μ -CT microstructures, *Cement and Concrete Composites*, 89, pp. 1-17.
- [19] **Sang-Yeop Chung**, Mohamed Abd Elrahman, and Dietmar Stephan (2017) The effects of anisotropic insulations with different spatial distributions on material properties of mortar specimens, *International Journal of Concrete Structures and Materials*, 11, pp. 573-584.
- [18] **Sang-Yeop Chung**, Mohamed Abd Elrahman, Pawel Sikora, Teresa Rucinska, Elzbieta Horszczaruk, and Dietmar Stephan (2017) Evaluation of the effects of crushed and expanded waste glass aggregates on the material properties of lightweight concrete using image-based approaches, *Materials*, 10, 1354:1-16.
- [17] **Sang-Yeop Chung**, Mohamed Abd Elrahman, and Dietmar Stephan (2017) Effect of different gradings of lightweight aggregates on the properties of concrete, *Applied Sciences*, 7, pp. 585:1-15.
- [16] **Sang-Yeop Chung**, Christian Lehmann, Mohamed Abd Elrahman, and Dietmar Stephan (2017) Pore characteristics and their effects on the material properties of foamed concrete evaluated using micro-CT images and numerical approaches, *Applied Sciences*, 7, pp. 550:1-19.
- [15] **Sang-Yeop Chung**, Mohamed Abd Elrahman, Dietmar Stephan, and Paul H. Kamm (2016) Investigation of characteristics and responses of insulating cement paste specimens with Aer solids using X-ray micro-computed tomography, *Construction and Building Materials*, 118, pp. 204-215.
- [14] **Sang-Yeop Chung**, Mohamed Abd Elrahman, and Dietmar Stephan (2016) Investigation of the effects of anisotropic pores on material properties of insulating concrete using computed tomography and probabilistic methods, *Energy and Buildings*, 125, pp. 122-129.
- [13] **Sang-Yeop Chung**, Dietmar Stephan, Mohamed Abd Elrahman, and Tong-Seok Han (2016) Effects of anisotropic voids on thermal properties of insulating media investigated using 3D printed samples, *Construction and Building Materials*, 111, pp. 529-542.
- [12] **Sang-Yeop Chung**, Tong-Seok Han, Se-Yun Kim, Jang-Ho Jay Kim, Kwang Soo Youm, and Jae-Hong Lim (2016) Evaluation of effect of glass beads on thermal conductivity of insulating concrete using micro CT images and probability functions, *Cement and Concrete Composites*, 65, pp. 150-162.
- [11] **Sang-Yeop Chung**, Tong-Seok Han, and Se-Yun Kim (2015) Reconstruction and evaluation of the air permeability of a cement paste specimen with a void distribution gradient using CT images and numerical methods, *Construction and Building Materials*, 87, pp. 45-53.
- [10] **Sang-Yeop Chung**, Tong-Seok Han, and Yong-Woo Kim (2015) Spatial distribution of voids in insulating concrete analyzed by micro-CT images and probability functions, *Advances in Materials Science and Engineering*, 516169, pp. 1-10.
- [9] Tong-Seok Han, **Sang-Yeop Chung**, Yong-Woo Kim, and Sung Youb Kim (2015) Effect of

phase interactions on crystal stress evolution over crystal orientation space under elastoplastic deformation of two-phase polycrystalline solids, *Journal of the Mechanics and Physics of Solids*, 76, pp. 1-19.

- [8] **Sang-Yeop Chung**, Tong-Seok Han, Se-Yun Kim and Tae-Hyung Lee (2014) Investigation of the permeability of porous concrete reconstructed using probabilistic description methods, *Construction and Building Materials*, 66, pp. 760-770.
- [7] Tae Sup Yun, Tong-Seok Han, **Sang-Yeop Chung**, and G. A. Narsilio (2014) Evaluation of hydraulic conductivity of reconstructed granular media generated using low-order probability functions, *KSCE Journal of Civil Engineering*, 18, pp.132-141.
- [6] **Sang-Yeop Chung**, Tong-Seok Han, Tae Sup Yun, and Kwang Soo Yeom (2013) Evaluation of the anisotropy of the void distribution and the stiffness of lightweight aggregate using CT imaging, *Construction and Building Materials*, 48, pp.998-1008.
- [5] Tong-Seok Han, **Sang-Yeop Chung**, and Byeongchan Lee (2013) Crystal stress distribution evolution of elastoplastically deforming polycrystals over crystal orientation space, *Computational Materials Science*, 75, pp.9-17.
- [4] **Sang-Yeop Chung** and Tong-Seok Han (2013) Correlation between low-order probability distribution functions and percolation of porous concrete, *Magazine of Concrete Research*, 65, pp.448-460.
- [3] Tong-Seok Han and **Sang-Yeop Chung** (2012) Dependence of crystal stress evolution on the vertices of the single crystal yield surface and the effect from the intergranular misorientation during plastic deformation, *Computational Materials Science*, 63, pp.35-46.
- [2] Tong-Seok Han, **Sang-Yeop Chung**, and Jae-Hyung Cho (2012) Investigation of crystal stress dependence on lattice orientation, loading direction, and grain interactions in a plastically deforming crystal embedded within a polycrystal aggregate, *Materials Science and Engineering A*, 552, pp.252-268.
- [1] **Sang-Yeop Chung** and Tong-Seok Han (2010) Reconstruction of random two-phase polycrystalline solids using low-order probability functions and evaluation of mechanical behavior, *Computational Materials Science*, 49, pp.705-719.

2. International Conferences

- [25] **Sang-Yeop Chung** and Seo-Eun Oh (2023) Microstructural analysis of the effect of clinker phase distribution on cement hydration using computer based approaches, *ICCC 2023*, Bangkok, Thailand
- [24] **Sang-Yeop Chung**, Su-Sung Jo, and Seo-Eun Oh (2022) Microstructural characteristics of cement mortar using cockle shell aggregates and waste fishing net fibers, *WCCM-APCOM*, Yokohama, Japan
- [23] **Sang-Yeop Chung**, Ji-Su Kim, and Tong-Seok Han (2020) Microstructural characteristics of foamed concrete with different supplementary cementing materials, *COMPSAFE 2020*, Kobe, Japan
- [22] Mohamed Abd Elrahman, **Sang-Yeop Chung**, Pawel Sikora, and Dietmar Stephan (2020) Experimental investigation on the drying shrinkage of structural lightweight aggregate concrete, *HiPerMat2020*, Kassel, Germany
- [21] **Sang-Yeop Chung**, Ji-Su Kim, Mohamed Abd Elrahman, Tong-Seok Han, and Dietmar Stephan (2019) The mechanical behavior of foamed concrete specimens with different binders evaluated using micro-CT images and crack phase field model, *ICCC 2019*, Prague, Czech Republic
- [20] **Sang-Yeop Chung**, Mohamed Abd Elrahman, and Dietmar Stephan (2018) The effect of homogeneity of solid phases on the mechanical properties of foamed concrete evaluated using

numerical approaches, Ibausil 2018, Weimar, Germany

- [19] **Sang-Yeop Chung**, Pawel Sikora, Tong-Seok Han, and Dietmar Stephan (2018) Development of advanced insulating materials for innovative and sustainable structures, ICSEFCM 2018, Szczecin, Poland
- [18] **Sang-Yeop Chung**, Mohamed Abd Elrahman, and Dietmar Stephan (2017) Development of ultra-lightweight concrete with different aggregates using numerical approaches, EKC 2017, Stockholm, Sweden
- [17] **Sang-Yeop Chung**, Mohamed Abd Elrahman, and Dietmar Stephan (2016) The effects of the spatial distribution of anisotropic insulations on characteristics of cementitious materials, ICCCM2016, Munich, Germany
- [16] **Sang-Yeop Chung**, Se-Yun Kim, and Tong-Seok Han (2015) Evaluation of the effect of glass beads on the material characteristics and response of insulating concrete using micro CT imaging and low-order probability functions, NDT-CE 2015, Berlin, Germany
- [15] Tong-Seok Han, Xiaoxuan Zhang, **Sang-Yeop Chung**, and Christian Linder (2015) Phase-field fracture modeling of microstructures with random void distribution, USNCCM 13, San Diego, USA
- [14] Ji-Su Kim, **Sang-Yeop Chung**, and Tong-Seok Han (2015) Effect of the spatial distribution of voids on the thermos-mechanical properties of porous media, USNCCM 13, San Diego, USA
- [13] **Sang-Yeop Chung**, and Se-Yun Kim, Yong-Woo Kim, and Tong-Seok Han (2015) Evaluation of permeability of concrete specimens affected by chloride attack using reconstruction and probabilistic description methods, IABSE Conference Nara 2015, Nara, Japan
- [12] **Sang-Yeop Chung**, Se-Yun Kim, and Tong-Seok Han (2014) Investigation of the effect of glass beads on the thermal conductivity of insulating concrete using micro CT images and probabilistic description methods, ICCES14, Changwon, Korea
- [11] Yong-Woo Kim, **Sang-Yeop Chung**, and Tong-Seok Han (2014) Coupled Li-ion diffusion and crack propagation during charge/discharge cycles in silicon nanowires used in Li0ion batteries, ICCES14, Changwon, Korea
- [10] Ji-Su Kim, Tae-Hyung Lee, **Sang-Yeop Chung**, and Tong-Seok Han (2014) Effect of base isolation on seismic fragility of aboveground LNG storage tanks, ICCES14, Changwon, Korea
- [9] **Sang-Yeop Chung**, Yong-Woo Kim, Ji-Su Kim, and Tong-Seok Han (2014) Evaluation of void distribution in insulating concrete using micro CT images and low-order probability functions, COMPSAFE2014, Sendai, Japan
- [8] **Sang-Yeop Chung**, Se-Yun Kim, and Tong-Seok Han (2014) Investigation of permeability of reconstructed porous concrete specimen using low-order probability functions, COMPSAFE2014, Sendai, Japan
- [7] **Sang-Yeop Chung** and Tong-Seok Han (2013) Evolution of crystal stress distribution on elastoplastic deformation of polycrystalline solids, EASEC13, Sapporo, Japan
- [7] **Sang-Yeop Chung** and Tong-Seok Han (2013) Analysis of correlation between the void distribution and the mechanical property of lightweight aggregates, ASEM13, Jeju, Korea
- [6] **Sang-Yeop Chung** and Tong-Seok Han (2013) Analysis on anisotropy of void distribution and stiffness of lightweight aggregate using CT images, USNCCM 12, North Carolina, USA
- [5] **Sang-Yeop Chung** and Tong-Seok Han (2012) Analysis of correlation between low-order probability distribution functions and percolation of porous concrete using CT image processing, CODE2012, Jeju, Korea
- [4] **Sang-Yeop Chung** and Tong-Seok Han (2012) Effect of anisotropic elasticity on gradient plasticity model for polycrystalline solids, CODE2012, Jeju, Korea
- [3] **Sang-Yeop Chung** and Tong-Seok Han (2011) Effect of plastic gradient on the grain interaction

of polycrystalline solids, ASEM11, Seoul, Korea

- [2] **Sang-Yeop Chung** and Tong-Seok Han (2009) Reconstruction of anisotropic two-phase microstructures using correlation functions and effect of phase clustering on mechanical behavior, USNCCM10, Ohio, USA
- [1] **Sang-Yeop Chung**, Tong-Seok Han, and Jung-Sik Kong (2008) Representation of Phase Clustering for Two-phase Anisotropic Materials, ASEM08, Jeju, Korea

■ Research Projects

2022-2023	Ministry of Oceans and Fisheries (Korea)	Development of carbon-reduced concrete mixing technique based on marine waster resource circulation and mobile 3D printing plant (해양폐기물 자원화 공정 기술을 활용한 탄소저감형 콘크리트 배합설계 기술 및 모바일 3D 프린팅 플랜트 구축)
2022-2026	NRF (Korea)	Development of multi-scale virtual experiment (VE) system for advanced construction materials
2021-2022	GS E&C (Korea)	Crack detection and analysis for Hollow core slab using image processing and machine learning (Image Processing 및 Machine Learning을 이용한 Hollow Core Slab 균열의 탐지 및 분석)
2021-2023	NRF (Korea)	Development of 3D bacteria printing platform using multifunctional bioinks (BRL)
2020-2022	KHNP (한수원, Korea)	Development of technologies for hole detection and health evaluation of reactor containment buildings using a full-waveform inversion of elastic waves
2020-2023	KAIA (Korea)	Development of multi-functional and lightweight hyper concrete using nano technology
2016-2018	DFG (Germany) & NRF (Korea)	Development of sustainable, environmentally friendly insulating concrete using recycled aggregates and organic materials (EU-Korea project)
2016-2017	NRF (Korea)	Investigation of the effect of pore size and distribution on the characteristics of insulating concrete using image-based methods and probability functions
2016-2018	BMBF (Germany)	Development of multi lightweight concrete (German Federal Chemistry of Education and Research)
2015-2016	DAAD (Germany)	Evaluation of the effect of anisotropic pore shape and distribution on the characteristics of insulating concrete using image-based methods and probabilistic description methods
2013	NRF (Korea)	Development of web based multi-scale simulation platform for the efficient design of energy nano materials
2011	NRF (Korea)	Design optimization system of infrastructure devices based on multi-scale analysis for polycrystalline materials on micro-macro scale
2010	GS E&C (Korea)	Research on evaluation of thermal properties of insulating concrete using experiment and simulation

2009 NRF (Korea) Development of analysis method of plastic flow in micro and nano polycrystalline materials

■ **Members**

2022- Member, Korean Institute of Bridge and Structural Engineers (KIBSE)
2019- Member, Korea Concrete Institute (KCI)
2017- Reviewer, Cement and Concrete Composites (Elsevier)
2017- Reviewer, Materials (MDPI)
2017- Member, International Union of Construction Materials and Structures (RILEM)
2016- Reviewer, Construction and Building Materials Journal (Elsevier)
2015- Reviewer, Materials and Designs Journal (Elsevier)
2009- Member, Korean Society of Civil Engineers (KSCE)
2009- Member, Korean Society of Hazard Mitigation (KOSHAM)
2007- Member, Computational Structural Engineering Institute of Korea (COSEIK)

■ **Relevant Skills**

1. Experiments

- CT image processing, X-ray diffraction experiment, Concrete mix design

2. Programming and Software

- MATLAB, Python, Fortran, ABAQUS, LS-DYNA, COMSOL, GeoDict, ImageJ

3. Languages

- English, German, Korean

Last update: May 2, 2024