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Photo Courtesy David Sella (ILP)

❖ SUMMARY

Dr. Oral Buyukozturk is George Macomber Professor, Professor of Civil and Environmental Engineering, and Director of the Laboratory for Infrastructure Science and Sustainability at the Massachusetts Institute of Technology (MIT). He received his Ph.D. degree in Structural Engineering from Cornell University in 1970. He joined the MIT faculty in 1976 following six years of experience, including two years at United Engineers and Constructors in safety analysis and design of nuclear containment structures, and four years as Senior Research Scientist with Marc Analysis and Research Corporation (Brown University affiliate) and as Adjunct Associate Professor at Brown University in computational engineering analysis and development. Professor Buyukozturk' s research focuses on resilience, sustainability and intelligence of physical infrastructure. He has made seminal contributions to this field with scientific and technological output that is of integrative nature ranging from materials level through buildings to regional scale. His research in this context has developed in an evolutionary fashion comprising three interconnected major thrust areas: (*i*) *multiscale mechanics, modeling, and design of concrete materials and structures for resiliency,* (*ii*) *design of sustainable cement-based construction materials and systems with lower carbon print and improved performance*, and (*iii*) *infrastructure condition assessment and resiliency through novel sensing, vision-based monitoring, and data analytics.* He has made groundbreaking innovations in these fields with transformative impacts and significant contributions to the civil and infrastructure engineering field through advancing research, practice, and education.
His research impacts are highlighted below:

- *Sustainable and durable cementitious materials for carbon reduction using locally available and waste materials.*
- *Interface modeling and experimentation for multi-material systems for durability and design.*
- *Multiscale concrete mechanics from atomistic to macroscale for material and system resiliency.*
- *Novel sensing and motion magnification for assessing dynamic and mechanical properties of infrastructure.*
- *Deep learning for vision-based structural monitoring.*
- *Energy-based seismic design for resilience and safety*
- *Earlier work on constitutive modeling of concrete and computational mechanics.*

His earlier work at MIT includes fundamental research and development in thermomechanical analysis of coal gasification vessels with ceramic linings, as well as his fundamental contribution in the evolution of segmental prestressed concrete bridge design and construction technology. He has conducted seminal research on fiber reinforced plastic (FRP) composites for structural rehabilitation. His early work at Marc Analysis/Brown University involved pioneering developments in concrete constitutive relations, and finite element analysis of complex structures with nonlinearities and progressive cracking. Computational concrete material models he developed are still in use today in major commercial general-purpose finite element programs. It is worth noting that his current pioneering work on computational multiscale concrete using molecular dynamics provides a fundamental basis for his earlier developments of phenomenological models of complex concrete behavior.

Professor Buyukozturk's research represents an integrated evolutionary development through a bottom-up approach contributing to establishment of a new paradigm in infrastructure engineering as a basis for the design of new infrastructure systems and assessment/rehabilitation of existing infrastructure with technological, economic, and social impacts. He has published 429 technical papers in refereed journals and proceedings. He edited/co-edited and contributed to 20 books and published over 100 original technical research and development reports. He has initiated, supervised, and co-authored 14 patents in his field. He has made more than 220 plenary keynotes and invited lectures around the world. He served the profession through professional societies in different capacities with more than 30 technical committees, distinctive consulting, services to governments, major conference organization and scientific memberships.

His work has been recognized through multiple prestigious honors and awards including the *George W. Housner Structural Control and Monitoring Medal* from the American Society of Civil Engineers (ASCE); the *Golden Mirko Roš Medal* of EMPA the Swiss Federal Research Laboratory for Materials Science and Technology; *Elected Fellow of the Scotland's National Academy of Science and Letters; the Distinguished Service and Leadership Award* from the Civil and Environmental Engineering Department at MIT; *Fellow of American Concrete Institute (ACI); Fellow of American Society of Civil Engineers (ASCE); Fellow of Engineering Mechanics Institute (EMI); ASNT* (American Society of Nondestructive Testing) *National Faculty Fellowship Awards (*2008 & 2011); and various best paper awards with his students and postdocs. He recently received *H. Adeli Award for Innovation in Computing* (2021) and recognized in 2021 Mendeley metadata of citations coordinated by Stanford University as in the top 0.1% cited scientists worldwide. He recently was awarded (2023) the prestigious Mustafa Inan Special Award by his alma mater Istanbul Technical University (ITU) for excellence in science and engineering- top level ITU award bestowed on its faculty and alumni.

Professor Buyukozturk, in his distinguished career of over 40 years at the Massachusetts Institute of Technology (M.I.T.), has made sustained and pioneering contributions to advancing world-wide infrastructure mechanics and materials research, sensing and monitoring, computing, and practice applicable to critical problems of civil infrastructure resilience, sustainability, and intelligence. He has advanced boundaries of knowledge and made significant impacts in his field with groundbreaking innovations and outstanding scholarly leadership in research, education, and professional service. With his impactful work he has enhanced scientific and engineering literature and educated and mentored outstanding leaders of academicians and professionals for the world.

❖ EDUCATION

Ph.D.	- Cornell University 1970
M.S.	- Cornell University
M.S.C.E.	- Istanbul Technical University

❖ PROFESSIONAL EXPERIENCE

1985 –	**Professor**, Department of Civil and Environmental Engineering, MIT, Cambridge, MA
1980 – 1985	**Associate Professor with tenure**, Department of Civil and Environmental Engineering, MIT, Cambridge, MA
1976 – 1980	**Associate Professor without tenure**, Department of Civil and Environmental Engineering, MIT, Cambridge, MA
2006 – 2006	**Visiting Professor**, Istanbul Technical University, Istanbul, Turkey
2006 – 2006	**Visiting Professor**, Kultur University, Istanbul, Turkey
1999 – 1999	**Visiting Professor**, National University of Singapore, Singapore
1998 - 2000	**Visiting Professor**, Bogazici University, Istanbul, Turkey

1991 – 1991 **Visiting Professor**, ETH, Zurich, Switzerland

1985 – 1985 **Visiting Professor**, Technical University of Berlin, Berlin, Germany

1983 – 1983 **Visiting Professor**, Istanbul Technical University, Istanbul, Turkey

1973 – 1974 **Adjunct Associate Professor of Engineering**, Brown University, Providence, RI

1972 – 1976 **Senior Research Engineer,** Marc Analysis Research Corporation, Providence, RI

1970 – 1972 **Research Engineer/Consultant**, United Engineers and Constructers, Philadelphia, PA

1967– 1970 **Research Assistant**, Department of Structural Engineering, Cornell University

❖ HONORS AND AWARDS

- Elected Fellow of the Scotland's National Academy of Science and Letters for *"Transformative contributions to computational analysis, engineering and design"* (2009).
- The Golden Mirko Ros Medal from Swiss Federal Laboratories for Materials Science and Technology for *"Most valuable and sustained contribution to materials science and engineering …"* (2011).
- George W. Housner Structural Control and Monitoring Medal from American Society of Civil Engineers (ASCE) Engineering Mechanics Institute (EMI) for *"Pioneering and transformative developments in video-based structural sensing and identification … and their integration with groundbreaking engineering mechanics research and practice for enhancing civil infrastructural resilience and sustainability"* (2018).
- Distinguished Service and Leadership Award from MIT to *"Recognize outstanding departmental service and leadership contributions … to further the department mission and vision and MIT as a whole"* (2018);
- Citation from the President of MIT Rafael Reif in a letter dated August 27, 2018: *"…You have not only advanced the boundaries of knowledge in your field but also brought so many of our young learners and researchers along with you in your discoveries. Your importance to our MIT community cannot be overstated. Thank you for advancing the MIT mission in such a sterling way."*
- Recipient of the George Macomber Professorship, MIT Endowed Chair, 2019
- Elected Fellow of the American Society of Civil Engineers (ASCE).
- Elected Fellow of Engineering Mechanics Institute (EMI) of ASCE.
- Elected Fellow of the American Concrete Institute (ACI).
- National Faculty Fellow Awards from the American Society of Nondestructive Testing (ASNT) in 2008 and 2011.
- The Hojjat Adeli Award for innovation in Computing in 2021
- Recognized in 2021 as the top 0.1% cited scientist world-wide in Mendeley metadata of citations coordinated by Stanford University.
- 2023 Mustafa Inan Special Award by his alma mater Istanbul Technical University (ITU) for excellence in science and engineering- top level ITU award bestowed on its faculty and alumni.

❖ LEADERSHIP IN EDUCATION AND SERVICE AT MIT

Prof. Buyukozturk' s life-long philosophy of civil engineering education in mechanics, structures and materials has been to offer courses that emphasize fundamentals and behavioral knowledge, through which innovative design solutions can be developed. He believes that research is an integral part of education in which methodologies and recent advances are incorporated, and class work emphasizes open-ended learning, self-development, project activity and teamwork. Since joining MIT in 1976, he has made consistent and sustained contributions to develop and support the undergraduate education program at MIT CEE and dedicated a considerable part of his time to the development of integrated core courses for undergraduate/graduate engineering. His early large-scale educational leadership activities include his

leadership in1980s as director of MIT-TUB (Technical University of Berlin, Germany) research and education program for eight years, and in 1990s, as leader at MIT of ECSEL national educational coalition initiative supported by NSF. With these programs the objective was to develop an educational framework and new teaching methods incorporating hands-on experience in teaching and research into the curriculum.

Prof. Buyukozturk with his initiative together with two other professors from Department of Material Science and Engineering, and Department of Aeronautics and Astronautics has developed in 1990s a university wide innovative course for incoming freshman and sophomore classes on "Colossal Failures in Engineering". This course has attracted an unexpectedly large number of students resulting in the class enrollment restriction; it has created much enthusiasm and excitement among the students who have learned root causes of signature structural failures in the history of the engineering profession. Other innovative courses developed by Prof. Buyukozturk includes the MIT OpenCourseWare (2004) teaching materials on structures and concrete mechanics (which have been translated into Chinese and other languages and used as major text material by many international universities), and courses on nuclear power technology, and design of offshore structures.

In recent years (2013-2021), Professor Buyukozturk has played a profound role in transforming the civil engineering education program in the Department of Civil and Environmental Engineering at MIT to the so-called 1-ENG umbrella structure, for a strong and a flexible education. As a member of the newly formed 1-ENG department committees he led the Pierce Laboratory education (civil engineering part of the department) and accreditation activities. In this context, he has developed a new core undergraduate course on "Mechanics and Design of Structures" combining elements of mechanics of materials, structural analysis, and design in an integrated form with projects to teach students the hands-on design process from fundamentals to the final product. He has complemented this core course with an upper undergraduate/graduate elective on mechanics and design of concrete structures, which incorporates advanced topics and elements of recent research. Recently, as a founding member he contributed to the establishment of a large school-wide initiative of New Engineering Education Transformation (NEET) program at MIT by developing the CEE departmental program within that initiative (2017-2019).

At MIT, Prof. Buyukozturk has continuously devoted his efforts to strategic direction and leadership roles. In 1990s and early 2000s he was the Head of the Materials and Structures group as an academic unit of the Civil and Environmental Engineering Department. Over his long career at MIT, he has been actively involved in various leadership roles. He has held various sustained capacities in critical departmental services as Department's doctoral program officer, admissions officer, chair or member of graduate and undergraduate committees, and faculty search and junior faculty mentoring committees. He also served as the director of the department's structures and materials testing laboratories. He initiated and established the long running Pierce Lab (civil engineering part of the department) Research Seminars and led its organization from late 1990s to 2020.

Prof. Buyukozturk has devoted significant efforts at every stage of his career to advance the culture of diversity and inclusiveness in the engineering field. He has supervised over 30 PhD students (majority at MIT with several international), 70 Master students, and over 30 undergraduate students, many of whom have developed successful careers in both academic and industrial fields. He has been motivating and nurturing freshman and undergraduate minorities for producing outstanding and innovative research results at the doctoral level which have led to several top journal publications contributed and co-authored by the undergraduates. In 2015 and 2016 two female freshmen supervised by Professor Buyukozturk have received the MIT's highest distinctive honor for undergraduate students – MIT Distinguished Freshman Award for Research.

Prof. Buyukozturk was awarded in 2018 the Distinguished Service and Leadership Award from MIT Department of Civil and Environmental Engineering to recognize his *"…outstanding departmental service*

and leadership contributions of a member of the CEE faculty…". He received a citation from the President of MIT Rafael Reif in a letter dated August 27, 2018: *"…You have not only advanced the boundaries of knowledge in your field but also brought so many of our young learners and researchers along with you in your discoveries. Your importance to our MIT community cannot be overstated. Thank you for advancing the MIT mission in such a sterling way."*

❖ PROFESSIONAL SERVICE

Throughout his career as a researcher and an educator, Prof. Buyukozturk's developments have progressed in parallel with his intense professional involvement with engineering and scientific communities. He has provided outstanding services to profession, the nation, and the world through his discoveries, and educating generations of students, researchers, and academicians. Selected highlights are:

- *Engineering education as a service to the world:* He has supervised over 30 Ph.D., 70 M.Sc. students, and over 30 undergraduate research students at MIT and selected international universities. Additionally, he served on over 30 PhD thesis committees. Many of his students have spread around the world and developed successful careers in both industry and academia. His lifelong philosophy of engineering education includes emphasizing fundamentals, bringing research into teaching, and aiming at innovative engineering solutions.
- *Services to US agencies:* NSF CMS/CMMI proposal evaluation panels; services in initiating new NSF science and technology programs; ACBM center site visit panel expert; NIST infrastructure assessment technology program development; Idaho State Board education national panel; DOT federal transit administration program development; Idaho National Environmental Engineering laboratory (INEEL) review and assessment of research programs; DARPA program development on battle damage assessment; AFF40 Air Force program committee; FHWA Federal Highway Bridge dynamics and field committee; ECSEL National education commission; TRB Transportation Research Board Member.
- *Services to foreign governments:* Special panel member of the board of Swiss Federal Institute of Technology to evaluate programs of material science departments at ETH and EPFL campuses, and PSI and EMPA Swiss national laboratories; NCAAA National commission for academic accreditation and assessment of the Kingdom of Saudi Arabia for accreditation evaluation of various universities including King Saud Univ. (KSU), King Fahd Univ. (KFUPM), and Qassim Univ. (QU); German research foundation (DFG) Panel member to develop scientific research initiatives; Government of Guinea Bissau, South Africa (through World Bank) development of port structures; Univ. of Sao Paulo Brazil engineering program accreditation; Research Grants Council (RGC) of Hong Kong for evaluating research programs and proposals; Swiss National Science Foundation (SNSF) for evaluating research programs and proposals.
- *Technical committee membership/leadership:* More than 30 national and international technical committees including ACI 349, ASCE/ACI 347, ASCE-ACI 447, ASCE EMI SHM, ACI 446, ACI 126, ASNT, RILEM TC 148, RILEM TC 69, RILEM RC & DE, RILEM QFS, RILEM TC SHM, RILEM TC NDE, ACI-ASCE, US-Japan Scientific committee SEM Fracture, EMI Fracture, TRB A3C14, TRB AFF 40, Task force of AASHTO AGC TRB, ASME Pressure Vessel division, various technical committees of SEM, IABSE, ACS, IIFRP, IIFC, AAAS, and ASNT NDT.
- *Editorial Board membership:* Served as editorial board member for, among others, the International Journal of Computer-Aided Civil and Infrastructure Engineering (CACAIE); and International Journal of Construction & Building Materials (JCBM).
- *Conference organization and scientific membership:* Initiated, organized and co-chaired major conferences including "International Conference on Nondestructive Testing of Materials and Structures (NDTMS-2011)" held in Istanbul, 2011; "International Conference on Understanding Corrosion Mechanisms to improve Infrastructural Durability at M.I.T. in 1997"; and "Gulf Conference on Sustainable Built Environment in Kuwait, 2019". He served as a scientific committee member of over 60 major conferences worldwide including long-time bi-annually running international conferences such as the sustained member of the International Advisory Board (IAB) of the "International

Conference on Structural Engineering, Mechanics and Computation, Cape Town, South Africa"; and long-time scientific committee member of the "International conference on Structural Faults+Repair, Edinburgh Scotland" both spanning over a period of more than 20 years; and of many others such as International Conference on Construction Materials for Sustainable Future, April, 2017, Zadar, Croatia organized by University of Zagreb.

- *National and International Consulting:* He was involved in 40 major national/international consulting projects. (See below for some details)
- Provided the technology to the London's major underground infrastructure project (Costain/Vinci grand projects joint venture) for the use of concrete with irradiated waste plastic for partial cement replacement as a sustainable solution for carbon reduction and waste plastic storage without the loss of mechanical properties. (FIB International conference proceeding, Oslo, Norway 2022.)
- Led his team as P.I. the effort to assess vulnerability of the historic buildings in the city of Groningen, Netherlands to induced seismicity due to gas exploration using his pioneering development of data-driven deconvolution interferometry (Eng. Structures 2021)
- Led his team as P.I. the effort to camera-based measurements of the vibration characteristics of the Portsmouth NH WWI memorial bridge for assessing its vulnerability to dynamic effects in collaboration with the state DOT. (ASCE Structural Journal, 2018)

As a member and/or chair/co-chair of numerous engineering societies, his research and developments including fundamental original contributions in finite element analysis, fracture mechanics, interface mechanics, composite materials, creep and shrinkage analysis of structures have been transformed into major engineering society publications. Some examples are the ASCE (American Society of Civil Engineers) special publication of "Finite element analysis of reinforced concrete", a 546 page book which represented the first formal publication on the topic in 1982; "Creep analysis of structures", "Finite element analysis of creep and shrinkage" and "Probabilistic models in mathematical modeling of creep and shrinkage of concrete" published by Wiley in 1988; "Fracture mechanics parameters influencing the mechanical properties of composites" in Advanced Technology for Design and Fabrication of Composite Materials and Structures, Kluwer Academic Publishers, 1995; "Interface Fracture and Bond" in ACI edited book, 1995. He has organized and chaired several major international conferences, one of which is the international conference on "Nondestructive Testing of Materials and Structures (NDTMS-2011)" in Istanbul, Turkey that led to his edited book (with co-editors) published by Springer as two volume RILEM book series of 1278 pages. This book was recognized as one of the most sold by Springer and cited volumes of the series. It has become a major reference in profession. He has also organized and co-chaired a major "International Conference on Understanding Corrosion Mechanisms to Improve Infrastructure Durability" at MIT in 1997 and published a comprehensive volume of proceedings.

As an active participant in the MIT Industrial Liaison Program (ILP), Prof. Buyukozturk has initiated and pursued collaborations with outstanding world class professional institutions, research laboratories and companies. In 1980s and beginning of 1990s he formed an industrial consortium with participation of 13 large international companies from oil refinery, steel, aluminum, glass, etc., industries with multiple million-dollar investments on the development of thermomechanical analysis and design methodologies for refractory ceramic linings. For his work and innovations in infrastructure engineering he has been extensively featured by MIT ILP, especially in recent years on the topic of infrastructure sustainability, through webinars and videos. Over the years as a faculty representative, he visited major industry and government engineering/science institutions including those in Germany, The Netherlands, United Kingdom, Switzerland, Italy, Turkey, China, Japan, the Philippines, Singapore, Indonesia, Kuwait, Saudi Arabia, United Emirates, Australia, and New Zealand for discussing research, education, and development directions as a basis for collaborative activities. Prof. Buyukozturk has received the lifetime achievement award from Swiss Federal Research Laboratory (EMPA) in 2011 for "*most valuable and sustained contributions to materials science and engineering in the domain of civil engineering, and for his outstanding research support to EMPA over the last two decades*".

Prof. Buyukozturk has contributed to the profession and society through his expertise as a consultant to major engineering problems and legal cases. He has served the profession as a consultant to nearly forty major US and international engineering organizations such as NASA, Westinghouse, Navy, Shimizu, Comalco of Australia, Knoor of Germany, Power Reactor and Nuclear Fuel of Japan, Kraftwerk Union Erlangen of Germany, among many others. In all his service, he has always maintained his outstanding stature and integrity. One exemplary case is his consulting for the State of Florida Office of Public Council (OPC) on the colossal failure case of the Crystal River unit 3 (CR3) nuclear containment system in 2011. The thick pre-stressed concrete containment wall had delaminated in the middle over a certain region of the great cylinder dome system (invisible from outside) due to a modification. Public Counsel J.R. Kelly of Florida states *"…Oral was the first and only structural and material expert ever retained by the OPC. His expertise and experience in nuclear containment design and modeling, finite element modeling and analysis, fracture analysis and material analysis and his advice were the primary reason that the OPC was able to negotiate a settlement with at least $1.7 billion in direct benefits to the consumers in Florida who stood to be overcharged … caused by the failed nuclear concrete structure."* (2011-2012).

❖ **SELECTED MEDIA COVERAGE**

- New tools could improve the way cement seals oil wells, **Engineers Journal**, 2019
- New tools could improve the way cement seals oil wells, **MIT News**, 2019
- Cities of the future may be built with locally available volcanic ash, **MIT News**, 2018
- Cities of the future could be built with concrete made from volcanic ash, **Newsweek**, 2018
- MIT Team Discovers Roman Secret of Volcanic Concrete to Build Future Cities, **Inverse Innovation**, 2018
- MIT students fortify concrete by adding recycled plastic, **MIT News**, 2017
- Students fortify concrete by adding recycled plastic, **Science Daily**, 2017
- MIT students fortify concrete through recycled plastic, **Architect Magazine**, 2017
- Using energy-based designs to enhance earthquake hazard resistance, **MIT News**, 2017
- With new model, buildings may 'sense' internal damage, **MIT News**, 2016
- MIT researchers make buildings smart enough to 'sense' internal damage over time, **Fox News**, 2016.
- Technique to monitor building 'health' utilizes ambient vibrations, **ASCE Civil Engineering Magazine**, Issue of February 2017.
- Intelligent building may 'sense' internal damage after earthquake, **Yahoo! News**, 2016.
- Buildings of future may 'sense' internal damage after earthquake, **Earthquake News**, 2016
- Intelligent building may sense internal damage after earthquake, **The Hans India**, 2016
- With New Model, Buildings May 'Sense' Internal Damage, **Science Newsline Technology**, 2016
- The Science Looks at Smart Buildings, Really Smart Ones, **Searching For Ithaka**, 2016
- Digital Nervous System Would Let Buildings Detect Their Own Weaknesses, **Popular Mechanics**, 2016
- New smart buildings may sense internal damage in real time, **India Today**, 2016
- With new computational model, buildings may "sense" internal damage, **Tech Explorist**, 2016
- MIT researchers develop sensing system to spot structural weakness in buildings, **Construction Dive**, 2016
- MIT Monitors Building Health, **Durability + Design**, 2016
- With the new model, buildings may 'sense' internal damage, **Science Daily**, 2016.
- New 'smart' buildings may sense internal damage in real time, **Business Standard** and **The Free Press Journal,** 2016.

- Intelligent building may 'sense' internal damage after earthquake, **The Economic Times Science**, 2016.
- New 'smart' buildings may sense internal damage in real time, **Business Standard**, 2016
- Future buildings could 'sense' internal damage after earthquake, says research, **India TV News**, 2016
- Intelligent building may 'sense' internal damage after earthquake, **News X**, 2016
- Designing a better built environment, **MIT ILP Institute Insider**, 2016
- Magnifying vibrations in bridges and buildings, **MIT News**, 2015
- CEE Magnifies Vibrations in Bridges and Buildings, **MIT CEE News**, 2015
- Magnifying vibrations in bridges and buildings, **Global News Connect**, 2015
- Researchers apply computer vision technique to see tiny vibrations in large structures, **Phys.org**, 2015
- A concrete solution - Insight into cement's microscopic properties may lead to stronger, more sustainable concrete, **MIT News**, 2017.
- Researchers look to nature for solutions to 'greener,' more sustainable concrete production, **American Ceramic Society**, 2016
- Finding a new formula for concrete, **MIT News**, 2016
- Finding a New Formula for Concrete, **Science News Line Physics & Chemistry**, 2016
- Finding a New Formula for Concrete, **European Coatings**, 2016
- Learning how things fall apart, **MIT News**, 2014
- Learning how things fall apart, **NSF News**, 2014
- Learning how things fall apart, **Science360 News**, 2014
- CEE's Buyukozturk receives lifetime achievement award from Swiss Federal Labs, **MIT News**, 2011

❖ SELECTED JOURNAL PUBLICATIONS

Chengping Rao, Pu Ren, Oral Buyukozturk, Hao Sun, and Yang Liu. Encoding physics to learn reaction-diffusion processes. Nature Machine intelligence 2023. In press.

Karamese, G., Yardimci, F., Gullu, A., Yuksel, E., Yalcin, C., & Buyukozturk, O. Vision-Based Dynamic Response Measurements of Structures by Using Smartphone Videos and Alternative Techniques. International Journal of Structural Stability and Dynamics, 2023, Vol. 23, No. 07, 2350069.

Xing Quan Wang, Oral Büyüköztürk, Christopher KY Leung and Denvid Lau. Atomistic prediction on the degradation of vinylester-based composite under chloride and elevated temperature. Composites Science and Technology, 2022, 226: 109539.

Xing Quan Wang, Wei Jian, Oral Buyukozturk, Christopher K.Y. Leung and Denvid Lau. Degradation of epoxy/glass interface in hygrothermal environment: An atomistic investigation. Composites Part B: Engineering, 2021, 206:108534.

J.M. Maragh, S.D. Palkovic, A. Shukla, O. Buyukozturk, and A. Masic. SEM-EDS and microindentation-driven large-area high-resolution chemomechanical mapping and computational homogenization of cementitious materials. Materials Today Communications 2021, 28: 102698.

D. Sen, J. Long, H. Sun, X. Campman, and O. Buyukozturk. Multi-component deconvolution interferometry for data-driven prediction of seismic structural response. Engineering Structures 2021, 241: 112405.

Gullu, A., Yuksel, E., Yalcin, C., & Buyukozturk, O. Damping effect on seismic input energy and its verification by shake table tests. Advances in Structural Engineering 2021, 24(12), 2669-2683.

Yalçın, C., Dindar, A. A., Yüksel, E., Özkaynak, H., & Büyüköztürk, O. Seismic design of RC frame structures based on energy-balance method. Engineering Structures 2021, 237, 112220.

K. Kupwade-Patil, P. Boul, D. Rasner, S. Lapidus, J. Leao, K.D. Johnson, C. Thaemlitz, and O. Buyukozturk. In situ investigation of phosphonate retarder interaction in oil well cements at elevated temperature and pressure conditions. Journal of the American Ceramic Society 2020, 103(11): 6400-6413.

K. Kupwade-Patil, A. Bumajdad, K.C. Littrell, O. Buyukozturk. In situ examination of engineered local additives in cement paste via neutron based scattering techniques. Construction Building and Materials, 2020; 243: 118175.

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K. Kupwade-Patil, P. Boul, D. Rasner, M. Everett, T. Proffen, K. Page, D. Ma, D. Olds, C. Thaemlitz, O. Buyukozturk, Retarder effect on Hydrating Oil Well Cements investigated using in situ Neutron/X-ray Pair Distribution Function (PDF) Analysis, Cement and Concrete Research, 2019; 126: 105920-1-13.

J. Long, O. Buyukozturk. A power optimised and re-programmable system for smart wireless vibration monitoring. Structural Control and Health Monitoring 2020, 27(2): e2468.

M. Uzun, H. Sun, D. Smit and O. Buyukozturk. Structural identification and damage detection using Bayesian inference and seismic interferometry. Structural Control & Health Monitoring 2019, 26(11): e2445.

R. Zhang, Z. Chen, J. Zheng, O. Buyukozturk and H. Sun. Deep long short-term memory networks for nonlinear structural response prediction. Computers & Structures, 2019, 220: 55-68.

A. Gullu, Y. Ercan, C. Yalcin, A. Dindar, H. Ozkaynak and O. Buyukozturk. An improved input energy spectrum verified by the shake table tests. Earthquake Engineering and Structural Dynamics 2019; 48(1): 27-45.

H. Sun, J. Al-Qazweeni, J. Parol, H. Kamal, Z. Chen and O. Buyukozturk. Computational modeling of a unique tower in Kuwait for structural health monitoring: numerical investigations. Structural Control & Health Monitoring 2019; e2317.

S. D. Palkovic, K. Kupwade-Patil, S. Yip, O. Buyukozturk. Random field finite element models with cohesive-frictional interactions of a hardened cement paste microstructure. Journal of the Mechanics and Physics of Solids 2018; 119: 349-368.

J. G. Chen, Travis M. Adams, H. Sun, Erin S. Bell and O. Buyukozturk. Camera-based vibration measurement of the Portsmouth, NH WWI Memorial Bridge. ASCE Journal of Structural Engineering 2018; 144(11): 04018207.

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K. Kupwade-Patil, C. De Wolf, S. Chin, J. Ochsendorf, A.E. Hajiah, A. Al-Mumin, and O. Büyüköztürk. Impact of Embodied Energy on materials/buildings with partial replacement of ordinary Portland Cement (OPC) by natural Pozzolanic Volcanic Ash. Journal of Cleaner Production 2018; 177: 547-554. [highlighted by MIT News, Newsweek, Inverse Innovation, etc.]

C. Schaefer, K. Kupwade-Patil, M. Ortega, C. Soriano, O. Buyukozturk, A. White, and M. Short. Irradiated Recycled Plastic as a Concrete Additive for Improved Chemo-mechanical Properties and Lower Carbon Footprint. Waste Management 2018; 71, 426-439. [highlighted by MIT News, Science Daily, Aggregate Research, Architect Magazine, etc.]

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