

SIKANDAR ALI KHOKHAR

Phone: +92-312-3722908
Sak04003@gmail.com; sikandar.cto@bendcrete.org
https://www.researchgate.net/profile/Sikandar_Khokhar3
<https://www.linkedin.com/in/sikandar-ali-khokhar-1702b118a/>

NSTP Building,
NUST, Sector H12
Islamabad, Pakistan 44000

EDUCATION

BS

National University of Sciences and Technology (NUST),
NUST Institute of Civil Engineering (NICE)
Civil Engineering
Major in Structural Engineering
CGPA= 3.66/4.0

June2022

RESEARCH INTERESTS

- Engineered cementitious composite (ECC) / HPFRCC
- Non-Linear Analyses
- Applications of ML in civil engineering
- Finite Element Analysis
- Sustainable and resilient construction materials
- Performance Based Seismic Design and Evaluation of Existing and New Buildings
- Nonlinear Modeling and Dynamic Analysis of Buildings and Special Structures

HONORS AND AWARDS

Rector's Gold Medal Awarded by NICE For the best FYP in bachelor's degree	2022
Best Industrial Project Awarded by NICE For Best Industrial FYP	2022
2nd Position Concrete Solutions Competition Awarded by American Concrete Institute (ACI) For the 2 nd best UG project	2022
1st Position Structural Design Competition Awarded by NED-UET Karachi For the most efficient structural design of long-span structure (40m span)	2022

Dean's Award List Awarded by NICE For highest GPA	2021
1st Position Hatch 8 Program Awarded by NSTP Best student led startup	2023
1st Position Startup Competition Awarded by Riphah International University Best student led startup	2023
3rd Position Global FICS Competition Awarded by NUST 3 rd Best University Project	2023
1st Position in Engineering Capstone Awarded by Pakistan Engineering Council (PEC) Best UG research Project	2023

RESEARCH EXPERIENCE

UG Thesis: Advancements in material and Structural Designing of Bendable Concrete for its Commercial implementation.	2022
Advisors: Dr. Rao Arsalan Khushnood & Dr. Fawad Ahmed Najam	
<ul style="list-style-type: none"> • ML Based Predictive model for material design of ECC • Development of nano-lime calcined clay cement (nLC³) based ECC • Structural design and performance based assessment of long-span ECC structures • A simplified framework for the orientation control of fibers in ECC matrix 	
NICE, NUST, Islamabad	2022 to Present
Position, Graduate student researcher	
<ul style="list-style-type: none"> • Effective stiffness ECC members under flexure • Structural Performance assessment of ECC in high-rise building structures 	

INDUSTRIAL EXPERIENCE

Bendcrete Construction Services (Pvt.) Limited, NSTP. Islamabad, Pakistan	July 2023 to Present
CTO and Head of R&D	

Bendcrete Construction Services (Pvt.) Limited is a student-led startup operating under the National Science and Technology Park (NSTP). With a focus on cost-effective solutions, Bendcrete aims to enhance the resilience of civil infrastructures against environmental hazards.

Bendcrete's interdisciplinary approach combines cutting-edge technology, advanced research, and collaboration with experts to develop innovative construction practices including the commercial implementation of *Bendable concrete*. They prioritize sustainability, incorporating eco-friendly materials and energy-efficient techniques. By striking a balance between affordability and quality, Bendcrete aims to create a future where structures can withstand natural disasters and contribute to resilient communities.

Selected Commercial Projects:

- Performance Based Seismic Assessment of 8 storey residential RC building in H12 Islamabad
- Structural Design of Fiber Reinforced Concrete (FRC) wall footing in the UK
- The structural design of timber residential structure in the USA
- Tier 2 Performance Assessment (as per ASCE 41-17) of Pre-Northridge commercial 3 storey structure in California, USA.
- Structural Fire Design of 2 storey residential timber structure in California, USA
- Structural Optimization of 2 storey composite concrete steel floor system in Malaysia

PUBLICATIONS

Book Chapters

- [1] **Khokhar, S.A.**; Shah, M.; Rehman, F.; Cheema, H.B.; Usman, M. “*Machine Learning in Sustainable Composite Building Materials to reduce carbon emission*” Elsevier **AAICE-2022 Submission No: 8501-Accepted**

Journal Publications

- [1] Khokhar, S.A.; Ahmed, T.; Khushnood, R.A.; Ali, S.M.; Shahnawaz. “A Predictive Mimicker of Fracture Behavior in Fiber Reinforced Concrete Using Machine Learning” *Materials* 2021, 14, 7669. Doi <https://doi.org/10.3390/ma14247669>
- [2] Rehman, F.; **Khokhar, S. A.**; Khushnood. R.A. “ANN based predictive mimicker for mechanical and rheological properties of eco-friendly geopolymer concrete” *Case Studies in Construction Materials*, vol. 17, Dec. 2022, doi: [10.1016/j.cscm.2022.e01536](https://doi.org/10.1016/j.cscm.2022.e01536).

Journal Papers in Review

- [1] **Khokhar, S.A.**; Ahmed, T.; Khushnood, R.A.; Basit, M.U.; Shahnawaz; Javed, S. “Development of High-Performance nano Lime Calcined Clay Cement (nLC3) based Engineered Cementitious Composite (ECC)” [Under Review in *Construction and Building Materials Elsevier* Manuscript ID CONBUILDMAT-D-23-06913R1]
- [2] **Khokhar, S.A.**; Ahmed, T.; Khushnood, R.A.; Basit, M.U.; Shahnawaz; Rizwan, S. “Framework for Orientation of PVA Fibers in ECC using Magnetic Field” [Under Review in *ACI Materials Journal* Manuscript ID M-2023-070.R2]

- [3] **Khokhar, S.A.**; Memon, S.; Ahmed, T.; Basit, M.U.; Najam, F.A.; Khushnood, R.A. “Seismic performance assessment of long-span engineered cementitious composite (ECC) structures” [Under Review in Case Studies in Construction Materials Elsevier Manuscript ID CSCM-D-23-01447]
- [4] Malik, U.J.; **Khokhar, S.A.**; Hammad, M.; Khushnood, R.A.; Najam, F.A.; Ali, F.; Shahid, M. “ANN-based predictive mimicker for constitutive model of Engineered Cementitious Composites (ECC)” [Under Review in Materials Today Communications Elsevier Manuscript ID MTCOMM-D-23-05921]
- [5] Khan, A.; **Khokhar, S.A.**; Siddique, A.; Khushnood, R.A. “A Predictive Mimicker for Mechanical Properties of Eco-efficient and Sustainable Bricks Incorporating Waste Glass Using Machine Learning” [Under Review in Case Studies in Construction Materials Elsevier Manuscript ID CSCM-D-23-01355]

Journal Papers in Progress

- [1] “Development of Equivalent Diagonal Strut Width Formula for Infilled Frame Structures, Considering Interface Flexibility and Wall Openings” [Manuscript writing in progress]
- [2] “Seismic Performance Assessment of ECC infilled circular steel dampers for high rise structures” [Testing completed, manuscript writing in progress]

Conference Papers in Review

- [1] **Khokhar, S.A.**; Basit, M.U.; Ahmed, T.; Khushnood, R.A. “Seismic performance assessment of ECC coupling beams in high rise tubular structures” [Abstract accepted in World Conference on Earthquake Engineering, Milan 2024 ID: WCEE24-ABS-5002-4836-131049-20230531232519]

INTELLECTUAL PROPERTY

- [1] **Khokhar, S.A.**; Ahmed, T.; Khushnood, R.A.; “A Predictive Mimicker of Fracture Behavior in Fiber Reinforced Concrete Using Machine Learning” Copyright filled in Pakistan [IPO ID: 673/2023]
- [2] **Khokhar, S.A.**; Ahmed, T.; Khushnood, R.A.; “A Composition of High-Performance nano Lime Calcined Clay Cement (nLC3) based Bendable Concrete” Patent filled in Pakistan

PROFESSIONAL TRAINING

- [1] **Workshop**
Description: Applications of Fiber Reinforced Cementitious Composite
Organized By: Capital University of Sciences and Technology (CUST), Islamabad.

- [2] **Webinar**
Description: Fiber Reinforced Concrete and Ultra High-Performance Concrete, A Holistic Approach
Organized By: American Concrete Institute (ACI)
- [3] **Webinar**
Description: Post-Tensioned Concrete Design and Construction
Organized By: American Concrete Institute (ACI)
- [4] **Webinar**
Description: Fiber-Reinforced Concrete-From Fresh Properties to Structural Design: New Tools, Guides, and Reports
Organized By: American Concrete Institute (ACI)
- [5] **Webinar**
Description: Elimination of Deck Expansion Joints on Existing Bridges
Organized By: American Society for Civil Engineers (ASCE)

PROFESSIONAL AFFILIATIONS

- [1] **Bendcrete Construction Services (Pvt.) Limited**
- Co-founder and technical lead (Structural engineer)
- [2] **American Concrete Institute (ACI)**
- Associate committee member ACI 544 (Fiber Reinforced Concrete)
 - Voting committee member ACI 544-OD (Structural design of FRC)
- [3] **American Society of Civil Engineers (ASCE)**
- Affiliated member ASCE
 - Member structural engineering institute (SEI)
- [4] **NUST Institute of Civil Engineering (NICE), NUST, Islamabad**
- Graduate Student Researcher

RESEARCH GRANTS

- [1] Material and Structural Design Guide of Bendable Concrete for Jointless Bridge Construction (**Co-PI**) [Technology Development Fund Grant by HEC Pakistan **In process**] (PKR 13.8M or 48,000 USD)
- [2] Engineered cementitious composites (ECC) for sustainable and long lasting railway sleepers. (**PI**) [ACI-NEX by ACI **Project Idea Submitted**] (50,000 USD)

COMMUNITY SERVICE

Akhuwat Foundation.

Volunteer, Karachi, June 2018-July 2018

Worked as Volunteer for Cloth Donation

Drive all over Karachi

LANGUAGES

Sindhi: Mother Tongue

Urdu: Native language

English: Professional Level

REFERENCES

1) **Dr. Rao Arsalan Khushnood** [Associate Professor]

Structural Engineering, NICE

National University of Sciences and Technology

Phone: +923339912091

Email: Arsalan.khushnood@nice.nust.edu.pk; ceo.structax@gmail.com

2) **Dr. Fawad Ahmed Najam** [Post-Doctoral Fellow]

Structural Engineering.

The University of British Columbia, Canada

Phone: +923345192533

Email: fawad.najam@ubc.ca

3) **Dr. Muhammad Usman** [Associate Professor]

Structural Engineering, NICE

National University of Sciences and Technology

Phone: +923378652748

Email: m.usman@nice.nust.edu.pk