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Seyed Mohammad Farnam

Current Position: Principal Research Engineer at Linköping University

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Summary

I am a highly accomplished **Principal Research Engineer** and **Ph.D. Civil Structural Engineer** at Linköping University (LiU), with over a decade of combined industrial project management and cutting-edge academic research experience. My journey in Sweden began as a **Guest Researcher** at LiU, where I also participated in the **LEAD incubator**, culminating in my current role. This path has allowed me to **found and progress a startup** focused on sustainable construction innovations.
My expertise directly aligns with **energy- and climate-efficient constructions**, backed by a strong background in **Life Cycle Assessment (LCA)**, **novel CO2 quantification methods**, and **sustainable materials**, particularly concrete (with transferable skills applicable to timber and other composites). I am driven by a commitment to setting knowledge in motion for sustainable societal development, eager to leverage my interdisciplinary collaboration skills, research leadership, and practical understanding of industrial implementation to contribute significantly to our research profile, especially in advanced materials and sustainable building solutions.

Skills & Expertise

- **Energy- and Climate-Efficient Construction & LCA:** Extensive Ph.D. research and recent experience dedicated to advanced sustainable concrete materials and structural health monitoring, focusing on developing innovative solutions that significantly reduce embodied and operational energy consumption in construction. Proven ability to develop **novel CO_2 quantification methods for improved LCA**, directly contributing to a deeper understanding of life cycle sustainability assessment of buildings.
- **Sustainable Materials & Circular Construction:** Deep expertise in the **molecular to macro-scale characterization** of sustainable materials (concrete, wood), including **chemical functionalization** and advanced **mechanical and bonding tests**. Proven capacity for cutting-edge research in developing **sustainable and circular construction materials** and enhancing material resource efficiency, particularly for concrete with strong transferable knowledge to timber structures.
- **Research-Driven Innovation & Industrialization:** Demonstrated success in translating innovative research into practical applications, including planning and establishing a start-up for sustainable concrete materials through the LEAD Business Incubator program in Linköping. This includes understanding **industrialized production along the value chain** and **design for manufacturability (DFM)** within sustainable contexts.
- **Structural Analysis for Energy Applications & Timber Structures:** Deep understanding of structural mechanics and material properties, enabling the analysis and optimization of components for sustainable building design and renewable energy systems. While my primary materials background is in concrete, my expertise in **fracture mechanics, finite element methods, and advanced mechanical testing** (including bonding and fatigue under thermal loading) is directly transferable and highly valuable for **designing wood-based building systems** and other competitive timber structures.
- **Research Leadership & Project Management:** Proven ability to independently plan and execute research projects, secure significant research funding (e.g., 500 kSEK and 100 kSEK grants from Linköping University), and publish scientific works. Extensive experience in leading engineering teams, managing industrial projects from design to compliance, and fostering cross-functional collaboration. Experienced in supervising PhD (2 current, 1 alumni) and Master's students (40 alumni).
- **Pedagogical Expertise & Curriculum Development:** Experienced in teaching advanced engineering principles, including Fracture Mechanics, Finite Element Method, Concrete Technology, and Durability, at both undergraduate and graduate levels. This background supports the development, planning, implementation, and evaluation of advanced-level courses in energy- and climate-efficient construction and integrates research findings into educational programs, specifically relevant for courses like 'Circular Construction and Climate Declaration of Buildings' and 'Sustainability in Concrete, Steel, and Timber Structures'.
- **Technical Problem Solving & Data Analytics:** Skilled in developing effective, innovative solutions for energy efficiency, material performance, and system optimization. Proficient in the application of BIM and other smart technologies in building energy-efficiency.
- **Scholarly Contribution & Peer Review:** Strong record of peer-reviewed publications and a demonstrated ability to critically assess technical information. Eager to contribute as an Editorial Board Member for "Current Alternative Energy," reinforcing my commitment to scholarly discourse and journal development.
- **Language Skills:** Persian (Native); English B2 (Upper-intermediate - **Proficient in English, with strong oral and written communication skills**); Swedish A2 (Currently in "Kurs-D i SFI"- **Acceptable in Swedish**).

Experience

Principal Research Engineer, Linköping University, Sweden (July 2025 - Present)

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- Leading cutting-edge research in sustainable construction materials (concrete, wood), with a strong focus on energy and climate efficiency.
- Developing novel CO2 quantification methods for improved Life Cycle Assessment (LCA) and advancing material durability through advanced mechanical and bonding tests.
- Driving the industrial impact of research findings, including the planning for production scale-up of innovative concrete materials as part of a start-up.
- Secured significant research grants from Linköping University (500 kSEK seed money, 100 kSEK climate compensation fund).

Guest Researcher, Linköping University, Sweden (November 2024 - July 2025)

- Conducted research on advanced sustainable concrete materials and structural health monitoring, contributing to innovative solutions that reduce energy consumption.
- Collaborated extensively with multidisciplinary teams (Chemistry, Applied Physics, Construction) and industry partners to develop cost-effective, durable, and sustainable waste materials for concrete.
- Actively involved in planning the establishment of two production lines within a start-up to commercialize innovative concrete materials.

Lead Incubator Participant, LEAD (Business Incubator), Linköping, Sweden (August 2024 - January 2025)

- Actively refined and developed a startup idea focused on sustainable construction solutions, participating in the intensive BootUp program.
- Gained significant practical experience in business development, market knowledge, and the journey toward launching a successful startup.

Chief Executive Officer, Mana Research Concrete, Hamedan, Iran (Oct 2017 - Dec 2023)

- Founded and led a self-employed research concrete venture, overseeing all aspects of business operations and research initiatives.
- Spearheaded research and development (R&D) projects in concrete materials, demonstrating strong technical and business leadership.
- Managed project timelines and resources, showcasing expertise in project leadership and decision-making for a successful enterprise.

Technical Lead, BRACE Concrete Industries Company, Hamadan Province, Iran (Feb 2013 - Dec 2023)

- Provided technical leadership and oversight for a wide range of concrete and construction projects, spanning over a decade.
- Managed teams and projects from pre-construction to completion, including structural engineering, formwork, and reinforcement.
- Implemented rigorous quality control and ensured compliance with industry standards and safety regulations for various concrete structures, roads, and bridges.
- Contributed to training and development initiatives, demonstrating strong people management and communication skills.

Research Assistant Professor, Raja University, Qazvin, Iran (Sep 2019 - Dec 2023)

- Conducted advanced research in civil and earthquake engineering, with a focus on concrete structures and materials.
- Designed and implemented research projects, utilizing tools like Abaqus for complex structural analysis.
- Mentored students and collaborated on academic papers, contributing to the university's research output and higher education leadership.

Supervisor & Constructor, [Construction engineering organization in Iran], Iran (2017-2023)

- Served as the primary link between design and construction on large industrial projects, ensuring constructability, compliance with codes, and rigorous quality control.
- Led and managed teams of engineers and construction workers, consistently ensuring on-time and within-budget project completion.
- Performed structural calculations and design optimization for various structural elements.

Assistant Professor, Educational Institution Daneshestan, Saveh, Iran (Jan 2016 - Jan 2018)

- Taught civil engineering courses, specializing in topics such as concrete, earthquake engineering, and structural analysis.
- Mentored students and facilitated their understanding of complex engineering concepts, demonstrating strong teaching and presentation skills.

Teaching Experience (2010-2023)

- Taught undergraduate and graduate courses in Civil Engineering at K.N. Toosi University of Technology, Bu Ali Sina University, and the Construction Engineering System in Iran.
- **Relevant Courses Include:** Concrete Technology, Concrete Durability, Fracture Mechanics, Pre-stressed Concrete, Structural Analysis, Finite Element Method, Earthquake Engineering.
- **While my direct teaching experience in Swedish is currently developing (Swedish A2), my extensive pedagogical background and experience supervising 2 current PhD students, 1 alumni PhD student, and 40 Master's students, along with formal training, demonstrate my capacity for teaching, curriculum development, and student mentorship in an advanced academic setting.**

Grants and scholarship

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- Research grant awarded by Linköping University- Seed money for research at the faculty of science and engineering (500 kSEK), 2024-2025.
- Research grant awarded by LiU's climate compensation fund (100 kSEK), 2024-2025.

Education

Ph.D. in Structural Engineering, Bu Ali Sina University, Iran (2012-2017) *

- Thesis: Fracture Mechanics of Pre-Stressed Sleeper Nonlinear Analysis in Numerical and Experimental Method

MSc in Structural Engineering, K.N. Toosi University of Technology, Iran (2009-2011)

- Thesis: Active Control of Structure versus Chaotic Response of Earthquake Excitation

BSc in Civil Engineering, Bu Ali Sina University, Iran (2005-2009)

Awards & Honors

- **Patent**: Developed an innovative additive to stabilize poor base and sub-base of roads, increasing compressive and tensile strength (collaboration with Bu-Ali Sina University and Iranian science park).
- **Ph.D. Research Student Award, Bu-Ali Sina University (2015-2016)**
- **Membership of the Talented Office, Bu-Ali Sina University (2015)**
- **Membership of the Elite Foundation, Iran (since 2016)**

Scientific supervision (main supervisor):

- **Today's PhD students: 2; Alumni PhD students: 1**
- **Alumni Master students: 40**

Language Skills

- Persian (Native)
- English B2 (Upper-intermediate)
- Swedish A2 (Currently in" Kurs-D i SFI")

References

1- Revrant Crispin, Professor, Head of Unit, Department of Science and Technology (ITN), Laboratory of Organic Electronics (LOE), Linköping University, Campus Norrköping, Kåkenhus.

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2- Dan Zhao, AssociateProfessor - Department of Science and Technology (ITN), Laboratory of Organic Electronics (LOE), Linköping University, Campus Norrköping, Kåkenhus. Email: dan.zhao@liu.se Tel: +4611363016

3- Zia Ullah Khan, Assistant Professor, Department of Science and Technology (ITN), Laboratory of Organic Electronics (LOE), Linköping University, Campus Norrköping, Kåkenhus. Email: zia.ullah.khan@liu.se Tel: +46700896279