

# Dr. Babitha Benjamin

Date of Birth: 04-02-1994

Age: 30 years

Marital Status: Married

Husband Name: Aijth Jacob A

Children: 1 Daughter

Child Name: Evelyn Susan Ajith (3 Years)

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## Objective

Dedicated and accomplished professional with a background in Construction Technology and extensive experience as a Research Associate at the CSIR-SERC Advanced Material Testing Laboratory—a central government facility specializing in 3D concrete printing. Eager to leverage my expertise in both Construction Biotechnology and 3D concrete printing to explore innovative intersections between the two fields, driving advancements in sustainable construction practices. Seeking opportunities to contribute to cutting-edge research initiatives that align with my dual passion for construction biotechnology and the transformative potential of 3D concrete printing technologies.

## Experience

### 1. Research Associate (Concrete 3D printing)

CSIR-SERC Advanced Material Testing Laboratory | December 2023–Present

- Hands-on experience in developing mix design for high-performance fiber-reinforced 3D printable concrete
- Experimentation on pumpability, flowability, and buildability of 3D printable concrete mix based on concrete rheology

### 2. Research Scholar (Building Materials and Construction Management)

NITC | December 2017–2023 | 6 Years

- Investigating, assessing, and researching unique problems related to construction environments.

- Conducting research and advising on the intricate interplay between materials, technology, and environmental factors to optimize safety, productivity, and comfort in construction practices and built environments.
- Thoroughly documenting findings and providing recommendations to enhance the quality of construction building materials.
- Training undergraduate and postgraduate students in civil engineering laboratories to conduct experiments and analyze the data obtained. Offering specialized guidance to students in research laboratories at NITC to complete their research projects.
- Excelled in providing invaluable teaching assistance to students in courses about building technology and construction management.
- Contributing insights to scientific discourse through presentations at conferences, and publication in scholarly journals.
- Conduct comprehensive patent searches within relevant technological domains, identifying potential areas for innovation and intellectual property development.
- Skillfully prepare and draft patent applications to protect novel concepts, processes, and technologies in construction materials and methodologies.
- Demonstrated exceptional innovation by patenting a groundbreaking bacterial consortium, developed through rigorous research, capable of effectively repairing microcracks in cement mortar.
- Engage in research activities focused on policy development and program administration pertaining to sustainable practices in construction, including recycling and waste reduction initiatives.
- Act as a catalyst for promoting public awareness and education on key issues such as efficient resource utilization, environmental conservation, and innovative approaches to waste management within the construction industry.

## **Education**

- Ph.D. in Building Materials and Construction Technology | NITC | 2017-2023
- M.Tech in Structural Engineering and Construction Management | [APJ Abdul Kalam Technological University] | 2015- 2017
- B.Tech in Civil Engineering | [Kerala University] | 2011-2015

## **Membership**

Indian Concrete Institute - Lifetime member No. 14021

## **Project Titles**

1. Ph.D. - Development and Performance Evaluation of Bacterial Consortium-Based Upcycled Cement Composites
2. M.Tech - Self-Healing Recycled Aggregate Bacterial Concrete
3. M.Tech – Planning, scheduling, controlling of a hospital building using Primavera under Navagraha Constructions (mini project)
4. B.Tech - Base Isolation for Earthquake Resistant Structures using Natural and Synthetic Rubber Latex

## **Patent**

1. Microbial Consortium-based Cement Composites for Sustainable Self-healing and Improved Structural Properties (Patent No.: 533272)

## **Research Outputs**

1. B. Benjamin, S. Zachariah, J. Sudhakumar, T. V. Suchithra, Bacterial consortium development and optimization for crack controlling cement mortar, *J. Build. Eng.* 77 (2023) 107501. <https://doi.org/10.1016/j.jobe.2023.107501>.
2. B. Benjamin, S. Zachariah, J. Sudhakumar, T. V Suchithra, Harnessing construction biotechnology for sustainable upcycled cement composites : A meta-analytical review, *J. Build. Eng.* 86 (2025) 108973. <https://doi.org/10.1016/j.jobe.2024.108973>.
3. I.O.P.C. Series, M. Science, Experimental Study on Microbial Concentration Optimization in Cement Mortar using M-Sand as Fine Aggregate Experimental Study on Microbial Concentration Optimization in Cement Mortar using M-Sand as Fine Aggregate, (2020). <https://doi.org/10.1088/1757-899X/936/1/012024>.
4. B. Benjamin, S. Lekshmi, S. Zachariah, J. Sudhakumar, T. V Suchithra, *Materials Today : Proceedings* A study on marine clay as fine aggregate in microbial cement mortar mix, *Mater. Today Proc.* 65 (2022) 1040–1045. <https://doi.org/10.1016/j.matpr.2022.04.132>.
5. B. Benjamin, S. Lekshmi, H.A. Nishaant, R. Geordy, J. Sudhakumar, A preface to agricultural wastes as sustainable construction material, *Mater. Today Proc.* (2023). <https://doi.org/10.1016/j.matpr.2023.05.512>.
6. B. Benjamin, S. Zachariah, J. Sudhakumar, T. V Suchithra, *Journal of Building Engineering: Development of Bacterial Consortium-based Upcycled Cement Composites* (under review)

## **Book publication**

1. J. Sudhakumar, R. Geordy, S. Lekshmi, B. Benjamin, H.A. Nishaant, Sujilee Publications: Bio-Sustainable Building Materials. (2021), ISBN:978-93-91935-43-6

## **Training and Certifications**

1. Workshop on Advances in 3D Concrete Printing from IITM (From 17/03/2023 to 18/03/2023)
2. Certified course on Oracle Primavera (29/08/2016)
3. Data collection and site training at Navagraha Constructions for a hospital building (From 13/06/2016 to 30/06/2016)
4. Workshop on ETABS (11/04/2016)
5. Attended the Soil mechanics and foundation laboratory and flexible pavement laboratories of Kerala Highway Research Institute, Trivandrum, as a part of Industrial Training.(From 26/5/2014 to 29/5/2014)
6. Attended training at the Thakaraprambhu flyover site under TRDCL (From 2/6/2014 to 3/6/2014)

## **Leadership experience**

- Student Volunteer at National Conference on Energy Conservation & Management Issues, Challenges & Policies on 21<sup>st</sup> February 2014
- Section co-chair for various paper presentation sections at Construction Materials and Structures (ICCMS-2022) during 13-19 December 2022

## **Language Skills**

1. English: B2 (Proficient)
2. Native Language: Malayalam
3. Tamil

## **Software Skills**

1. Auto CAD & ETABS
2. Primavera P6
3. Design-Expert v12 & Minitab
4. OriginLab
5. Office 365

## Referee

1. Dr. Prabhat Ranjan Prem  
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2. Dr. Sudhakumar J,  
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3. Dr. Suchithra T.V,  
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