CURRICULUM VITAE

Dr. P. SARANYA B.E. M. Tech., Ph.D.

Assistant Professor (Grade II)
Department of Civil Engineering
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CAREER VISION

To augment my knowledge and to conduct cutting edge research to help improve the lives of people.

EDUCATION

Program	Institution	%/CGPA	Year of completion
Ph. D in Environmental Engineering	Indian Institute of Technology Madras	**10**	June 2019
M. Tech in Environmental Engineering	National Institute of Technology Tiruchirappalli	**9.5**	May 2013
B.E in Civil Engineering	Thiagarajar College of Engineering (Affiliated to Anna University)	**9.46**	May 2011
HSC	T. V. S. Higher Secondary School, Madurai	**94.08**	May 2007
SSLC	T. V. S. Higher Secondary School, Madurai	**94.2**	May 2005

EMPLOYMENT

Employer	Position Held	Date of Joining	Date of Leaving
NITK Surathkal	Assistant Professor (Grade II)	18.10.2023	Till date
NITTE University	Assistant Professor (Grade III)	01-03-2021	16.10.2023
NIT Trichy	Assistant Professor (Ad hoc)	05-08-2013	01-01-2014

SCHOLASTIC ACHIEVEMENTS

- Received **Shree Gaayathree Devi Award** for scoring highest CGPA among women in all the courses registered as a research scholar at IIT Madras during the convocation held in September 2019.
- **MHRD, Government of India Research Scholarship** for pursuing Ph.D. at IIT Madras (2014-2019).

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- Awarded **Gold medal** for securing first position in MTech Environmental Engineering, National Institute of Technology, Tiruchirappalli.
- Received **Best Outstanding Student Award** in MTech Environmental Engineering for the year 2012-13 by the Alumni Association of National Institute of Technology, Tiruchirappalli.
- Awarded **Academic Proficiency Prize** for securing first rank in I & II semesters during 2011-12 at National Institute of Technology, Tiruchirappalli.
- **MHRD, Government of India Scholarship** for pursuing M. Tech at NIT Trichy (2011-2013).
- Won **Silver medal** for securing first position in 1st – 6th Semesters at Thiagarajar College of Engineering, Madurai.
- Awarded **Gold medal for Scoring centum in Mathematics** in both SSLC and HSC Board Examinations**.** (2005 & 2007).
- Awarded **Proficiency prize for securing State third in Tamil (96/100)** in Board Examinations**.** (2005)

RESEARCH INTEREST

- Air pollution monitoring and modeling
- Application of Machine learning and artificial Intelligence techniques for modeling air pollutant concentrations
- Indoor air quality
- Source apportionment of air pollutants
- Environmental Impact Assessment

LIST OF PUBLICATIONS

INTERNATIONAL JOURNAL (5)

1. K. Deekshitha, Thanushree A. Hegde, **Saranya P** and Arun Kumar Bhat (2023). Environmental pollutant hydrogen sulphide and its detection – A brief review. Materials today, Elsevier Publications, ISSN 2214-7853, https://doi.org/10.1016/j.matpr.2023.04.491
2. **Packiam Saranya,** S. T. Ramesh and R. Gandhimathi (2022) Coagulation performance evaluation of alginate as natural coagulant for the treatment of water. *Water Practice and technology,* 17 (1): 395–404.
3. Mohan, S., and **Packiam Saranya,** (2019) A novel ensemble approach for predicting summer time ground level ozone concentration. *Journal of Air and Waste Management, 69(2): 220-233.*
4. Mohan, S., and **Packiam Saranya** (2019) Assessment of tropospheric ozone in an industrial area of Chennai megacity. *Journal of Air and Waste Management, 69(9): 1079-1095.*
5. **Saranya, P.,** S. T. Ramesh and R. Gandhimathi (2014) Effectiveness of natural coagulants from non-plant-based sources for water and wastewater treatment - a review. *Desalination and Water treatment,* ***52****(31-33), 6030-6039.*

INTERNATIONAL AND NATIONAL CONFERENCE(4)

1. Deekshitha K, Thanushree A Hegde, **Saranya P,** Thangamani R (2023) Performance analysis of resistive based environmental sensors for air pollution monitoring - A review. *International Conference on Civil Engineering Trends and Challenges for Sustainability (CTCS 2021),* Lecture Notes in Civil Engineering (Springer Publications).

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2. Annapurna Basayya Balulmath, Sridhar G and **Saranya P** (2023). A Critical Review on potential use of Waste Foundry Sand in Geotechnical and Pavement Applications. In: Babu T. Jose, Dipak Kumar Sahoo, Sanjay Kumar Shukla, Dr. A. Murali Krishna, Jimmy Thomas, V Veena (eds). Geotechnics: Learning, Evaluation, Analysis and Practice (GEOLEAP). Lecture Notes in Civil Engineering, 2023, vol 4. Springer, Singapore.

3. **Saranya, P** and Deekshitha, K (2022). Assessment and Modeling of $PM_{2.5}$ in an academic zone. International Conference on Emerging technologies in Engineering and Science, NMAMIT. NITTE (DU), Karkala, Udupi, Karnataka.

4. **Saranya, P** and S. Mohan (2016). Seasonal and diurnal variation of air pollutants in an industrial area. National conference on Energy and Environment, organized by CODISSIA and IIT Madras, (16-17th September, 2016).

5. **Mohan, S., and P. Saranya,** (2016) Modeling of ground level ozone in an industrial area using data mining techniques. *International conference on Environmental Science and Technology (ICEST-2016), Houston, Texas, USA, (6-10th June, 2016).*

6. **Mohan, S., and P. Saranya,** (2016) Modeling of ground level ozone in an industrial area using data mining techniques. *International conference on Environmental Science and Technology (ICEST-2016), Houston, Texas, USA, (6-10th June, 2016).*

7. **Saranya, P** and S.T. Ramesh (2013). Treatment of turbid water using algal alginate. National Conference on the recent trends in Civil Engineering, organized by Bharathidasan University.

ADMINISTRATIVE RESPONSIBILITIES

1. **Coordinator** (i/c for Environmental Auditing) **-** Institute Auditing
2. **Laboratory In-charge -** Environmental Engineering Laboratory- NMAMIT, NITTE (Deemed to be University).
3. **Coordinator** & Member of Magazine Committee – Institute level and Department level
4. **Faculty in-charge –** Mid- Semester Examinations
5. **Member –** Board of Studies (U.G programme)

UG PROJECT GUIDANCE – 5 GROUPS

1. Comparison of household level drinking water treatment technologies using analytic hierarchy process.

2. Modeling of $PM_{2.5}$ in an industrial area using data mining

3. Analysis of microplastics in beaches and lakes in Udupi region

4. Low-cost natural coagulants for water treatment

5. Biomass from agro-waste as sustainable acoustic material – **Received Commendation prize** during Project Expro'23, NMAMIT, NITTE (DU)

COURSES TAUGHT (UG & PG)

- Water Supply Engineering
- Waste Water Engineering

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- Environmental Impact Assessment
- Environmental Studies
- Elements of Civil Engineering
- Engineering Mechanics

TRAINING PROGRAMME (4)

1. Attended Summer Fellowship programme-09 at **Indian Institute of Technology, Kanpur.**

2. Attended Summer Internship Programme-10 at **Indian Institute of Technology, Madras.**

3. Undergone Industrial training at **Airport Authority of India**, Chennai during the year 2009.

4. Undergone In-plant training at Aundipatti-Sedapatti combined water supply scheme in water treatment plant in Vaigai Dam, Theni during the year 2012.

SKILLS

- Four years of Working Experience in Environmental Laboratory Testing (**IITM**).
- Have working experience in Gas Chromatography- Mass spectrometry (GC-MS), Atomic Adsorption Spectrometer (AAS), UV-VIS spectrometer.
- One Year Working Experience in an industrial area for monitoring the air quality.
- Worked with sophisticated instruments for air pollutants monitoring and characterization.
- Application Software skills: **WEKA.**
  - Modeling of ground level ozone (using data mining models)
  - Modeling of summer time peak ozone concentration (using ensemble models).

CONSULTANCY PROJECTS INVOLVED

1. Treatment of Petrochemical effluent (Under the guidance of Prof. S. Mohan and Dr. S. Mathava Kumar, IIT Madras)

The effluent samples were treated by using biological treatment methods using specific microorganism culture by the concerned industry. After treatment, the TDS and COD of the samples were not reduced. Hence, instead of biological treatment, advanced oxidation process was performed and the results were satisfactory. After collecting the effluent samples, sodium hydrogen sulphite was added to avoid further reaction (known as quenching). The pH of the samples was found to be above 11, hence the samples were neutralised using HCl. Advanced oxidation process was conducted by adding various proportions of hydrogen peroxide and finally the effluent characteristics were analysed.

2. Environmental Impact Assessment for Neyveli Lignite Corporation Limited (Under the guidance of Prof. S. Mohan, IIT Madras)

In order to obtain the Environmental clearance, Environmental Impact Assessment study is very important to be carried out. The components taken were soil, ground water, surface water and air. Required number of samples was taken in a 5 km radius and the samples were tested in the laboratory. Around 40 different parameters were tested for each component. Finally, the values were compared against the standard values and the reports were prepared accordingly.

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3. *Subsidence calculation for Neyveli aquifers due to ground water pumping (Under the guidance of Prof. S. Mohan, IIT Madras)*

Subsidence can be defined as movement of ground surface as a result of readjustments of the over burdens due to collapse or failure of underground-mine works. Surface subsidence features usually take the form of sinkholes or troughs. The amount of subsidence and the time over which it occurs are the most important factors in determining whether measurable damage will occur or not. There is various method for prediction of subsidence and in our work, we used theoretical calculation procedure. The recommendations were given based on the final subsidence values.

4. *Assessment of civil, mechanical and environmental physical conditions of the Municipal solid waste processing and disposal unit (Under the guidance of Prof. S. Mohan, IIT Madras)*

The increase in generation of solid waste is only the result of the rapidly growing human population and the adopted modern life style; the substantial increase in the solid waste generation resulting into the contamination of air, water and land resources. Municipal solid wastes, commonly known as trash or garbage, are the solid wastes generated from different municipalities. Some of these wastes have been proved to be extremely toxic and infectious. The uncontrolled and un-scientific dumping of such wastes has brought about a rising number of incidents of hazards to human health. Contamination of surface and ground water arose more serious human health risk. Civil infrastructural facilities were checked. The vehicles and machineries used for various processed were tested. The environmental conditions of the site such as dumping, handling of municipal waste etc were assessed. The ground water samples surrounding the site were tested for heavy metals and other toxic contaminants.

5. *Quality assessment of bore well samples taken at a landfill site (Under the guidance of Prof. S. Mohan, IIT Madras)*

Bore well samples were collected surrounding the landfill site in order to investigate the effect of dumping waste in that area. Around 34 parameters were tested in the laboratory using the standard procedure namely "Standard methods for the examination of water and wastewater – APHA 2000". All the parameters were compared against the standard values.

6. *Solid waste management of municipal solid waste through pyrolysis process (Under the guidance of Prof. S. Mohan, IIT Madras)*

Initially the characterization of the waste was done and proportion of combustible and incombustible wastes was found out. Based on the composition, it was proposed to establish the waste to energy plant. The design period for waste to energy plant is considered for an initial period of 15 years. 4 pyrolysis plants will be adequate to handle the waste generated until the year 2030-31. The present calorific value is 1800 kcal/kg. The efficiency of the pyrolysis plant is assumed to be 75%, which means $3/4^{th}$ of the feedstock's potential heat value should be recoverable. The efficiency of the combined steam/gas turbine system used for power generation is assumed to be 40%.

PROJECTS

- **Ph. D Thesis** Titled "**Assessment and modeling of ground level ozone in an industrial area**" (5 Years)
  - Assessment of air pollutants such as ozone, nitrogen oxides and VOC.
  - Studies on diurnal and seasonal variation of ground level ozone.

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- Studies that will help to understand the effect of meteorological parameters and NO_X on ground level ozone.
- Health risk assessment of ground level ozone in an industrial area.
- Modeling of ground level ozone and peak ozone concentration using advanced data mining techniques.

- **M. Tech Thesis** Titled "**Coagulation performance evaluation of alginate as natural coagulant for the treatment of turbid water**" (**2 semesters**)
  - Non plant based coagulant alginate has been used as natural coagulant
  - Identification of the mechanism of coagulation involved in the process.
  - The efficiency of the coagulant (Optimum coagulant dose) was checked for different alkalinity and pH ranges.

- **B.E Project** titled "**Shear strength and compressibility characteristics of Lime column stabilized clay**" (**4 months**)
  - Clay possessing highly shrinking and swelling characteristics were strengthened using the lime columns of varying size and their unconfined compressive strength was checked at different curing periods.
  - In addition to lime, fly ash was added in different ratios, and improvement in bearing capacity of the soil was tested.
- **Summer Internship project at IITM** titled **lateral response of pile groups** (**2 months**)
  - Behavior of batter piles and pile groups in clay under static loading were studied by numerical simulations conducted on model piles in clay and the response was simulated using Group 7.0 software package.
- Training at **Airport Authority of India Chennai** (**4 weeks**)
  - Learnt design of runway and other structures in airport, lighting systems on runway.
  - Worked on analysis of site investigation report and design of secondary runway.

LABORATORY AND APPLICATION SOFTWARE EXPERIENCE

1. Experimental Skills

Basic experiments for the analysis of different constituents present in water and wastewater were learnt and practiced as a part of M. Tech and Ph.D. Curriculum in NIT Trichy and IIT Madras. During Ph.D. work, in addition to above, various experiments for monitoring of air quality were learnt.

2. Software Skills Gained

Sufficient working knowledge in **various environmental software** learned as a part of M. Tech curriculum and Ph.D. respectively.

3. Use of High-End Computational Resources (e.g.: HPC)

As a part of my Ph. D work, I have effectively utilized High Performance Computing resources at IIT Madras for running WEKA (data mining software). Hence, I have sufficient experience in using High Performance Computing resources for running application software.

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