Textile and Materials Engineer/Statistician/Scientist

Radhakrishnaiah Parachuru (Krishna.parachuru@ mse.gatech.edu; 404-906-5049)
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a. Professional Preparation

PhD - Textile & Polymer Engineering, Indian Institute of Technology, New Delhi, India..
MS - Applied Statistics/Decision Sciences, Georgia State University, Atlanta, GA.
M. Tech - Textile Technology, Univ. of Madras, India.
B. Tech - Textile Technology, Univ. of Madras, India.

b. Appointments

Chief Technical Manager, Telangana Textile Mills, Hyderabad, India.
Assist. Prof & Professor, Dept of Textile Technology, PSG College of Technology, Coimbatore
Post-doctoral Research Associate, College of Textiles, N.C. State University, Raleigh, NC.
Research Scientist-I, Scientist-II, Senior Scientist, Principal Scientist, Georgia Institute of Technology, MSE, Atlanta, GA. (1989- 2022)
Emeritus Faculty Member, MSE, Georgia Tech, Atlanta, GA (2023-Present).

c. Major Products (65 refereed publications, 198 conference presentations, and 4 book chapters)

(i) ***Invited Presentations (Recent Participation)***

Parachuru, R., 'The Impact of Smart Fabric Shades and Built-in Control Strategies on Energy Savings, Building Comfort and Visual Quality', Year 2023 Smart Fabrics Summit of the Advanced Textile Association.

Parachuru, R., 'A Quick Look at the Recent Advances, Current State of Utilization and Expected Future Usage of Artificial Intelligence (AI) In the Global Textile Manufacturing Industry, Year 2023 US Textile Trade Show and Conference.

Parachuru, R., 'Selected Research Briefs on the Fabrication of Value-Added Composites Using Recycled Textile Waste as Reinforcement Material,' Year 2022 Regional US Textile Industry Conference.

Radhakrishnaiah Parachuru, 'Select Highlights of Recent Research on Turning Textile Waste and Recycled Textiles into Biodiesel', Year 2023 Regional US Textile Industry Conference.

ii) ***Books/Book Chapters (Recent)***

Contributed to a 25-page Chapter on 'Mechanical Failure of Fiber and Polymer Materials and Fabricated Products (Textbook published by AATCC in March 2022).

(iii) ***Selected Peer Reviewed Journal Papers of Recent Origin (2021-2023)***

1. Parachuru R. A Quick Look at the Recent Advances, Current State of Utilization, and Expected Future Usage of Artificial Intelligence (AI) In the Global Textile Manufacturing Industry. J Textile Eng. Fashion Technol. 2023; 9(6):190–194. DOI: 10.15406/jteft.2023.09.00355.
2. Parachuru, R., 'Selected Research Briefs on the Fabrication of Value-Added Composites Using Recycled Textile Waste as Reinforcement Material,' Novel Research in Sciences, Vol. 14, Issue 3, March 2023.
3. Radhakrishnaiah Parachuru, Select Highlights of Recent Research on Turning Textile Waste and Recycled Textiles into Biodiesel, International Journal of Materials Engineering and Technology, March 2023, 1-5, DOI: 10.17654/
4. Parachuru, R., 'Textile Structures are Ideal Substrates for Nanoparticle Finishes and they Permit Major Improvement in Performance Properties', J. Text. Sci. & Eng., Vol 13:1, 2023.
5. Parachuru, R., Microfluidic Devices Made with Fibers, Yarns and Fabrics are Making Revolutionary Advances in Multiple Application Areas, Feb. 2023 Issue of Textile World Magazine.

6. R. Parachuru, Geethanjali, P. and Lavanya Krishnan, A Comprehensive Look at the Current and Future Technologies Suitable for at Home Detection and Management of Viruses and Virus Causing Diseases, Part I: Point of Care Detection Technologies, World J. Adv. Eng., Tech & Sci., (WJAETS), April 2023, https://wjaets.com; DOI: 10 30574/wjaets
7. R. Parachuru, Geethanjali, P. and Lavanya Krishnan, A Comprehensive Look at the Current and Future Technologies Suitable for at Home Detection & Management: Part II: Technologies for Remote Diagnosis, Monitoring, and Treatment, World J. Adv. Eng. Tech & Sci., (WJAETS 2023-0088), November 2023, https://wjaets.com.
8. Parachuru, R. and Lavanya Krishnan, 'Recent Advances in Skin Care Enabled by the New Developments in Nanotechnology and Nanomaterial Fields' - (Parts I & II, Submitted for Publication)
9. Parachuru, R., 'The Role of Material Selection and Design on The Sleep Quality and Performance of Bedding Products', (accepted for publication in J. Text. Sci. & Eng.)
10. Parachuru R., 'Engineered High-End Performance Mattresses and Pillows and Their Influence on Sleep Quality, Quality of Life and Human Performance', Proceedings of Global Summit on Advances in Materials, Physics and Chemical Science, July 2022.
11. Rohan Ukhade and Radhakrishnaiah Parachuru, A Comprehensive Look at the Detection, Monitoring, and Control of Environmental Pollution with Particular Focus on New and Emerging Solutions to Address the Problem', Journal of Material Sciences & Engineering, Vol 10:12, 2021.
12. Julia Roberts and R. Parachuru, 'New and Emerging Smart Materials and Their Applications: A Review', J. Matls. Sci. & Eng., Vol. 10:9, 2021.

d. Synergistic Activities

- Life member of the Fiber Society
- AATCC (Organizing Member of Four Research Committees)
- AATCC (Chairman of Statistics Committee)
- Member, ASME Division of Textile Engineering
- TQCA (Board Member)
- Indian Textile Association (Life Member)

e. Basic Research -Thesis Advising

- Total number of graduate students advised: 16; Total research grants: $ 2.0 million.

f. Recent Research Grants (Secured during 2020-2022)

- *$96,800 - One year CDC funded project* (*AWD-001549): Design, Development and Evaluation of Reusable Low-Cost, High-Performance Mask Suitable for High-Volume Use.*
- *$23,700 – Six-month project sponsored by Mueller Company for developing a rapid aging test to predict the life of painted surfaces of metal and plastic valves used in water supply lines.*
- *$7000 – One-month project sponsored by Patagonia Inc. to characterize the dynamic mechanical behavior of stretch (elastic) yarns and to relate measured properties to processing parameters.*
- *$9000 - Development of stretch-to-fit tubular knit fabrics with controlled compression behavior and favorable surface friction properties for healthcare applications*

g. Teaching (Extensive coverage of soft and hard materials and their fabrication/characterization)

Textile/Polymer Courses

- *Yarn Manufacturing* (Theory and Lab)
- *Weaving Technology* (Theory and Lab)
- *Knitting Technology* (Theory and Lab)
- *Nonwovens Technology* (Theory and Lab)
- *Textile Testing and Quality Control* (Theory and Lab; Taught for 25 years)
- *Carpet Manufacturing* (Theory and Lab)

- *Polymer Characterization* (Laboratory)
- *Fiber and Polymer Science*

Engineering Electives (Open to All Georgia Tech Majors)

- ✓ *Introduction to Polymer, Fiber, and Textile Industrial Complex – All Engineering Majors*
- ✓ *Fiber and Polymer Materials and Fabricated Products for Healthcare Applications – All Majors*
- ✓ *Introduction to Materials for Engineers – All Majors*
- ✓ *Statistics for Engineers -- All Majors*

Materials Science and Engineering Courses

- ❖ *MSE 3021- Characterization of Materials (Core course required for all MSE students)*
- ❖ *MSE 4022 - Fabrication Technologies for Soft and Hard Materials (Core course)*
- ❖ *MSE 4027- Senior Design Course (Problem-solving group project funded by industry)*

Supervised the everyday operation of three material characterization laboratories and three fabrication technology laboratories. Exposure to all material types and their characterization/fabrication tools makes me a uniquely broad-based materials scientist and researcher.

h. Applied Research -Services Provided for the Benefit of Industry and General Public Between 1990 and 2022 (32 years), I served as the ***coordinator of industry and public service activities*** of MSE (School of Materials Science and Engineering). As a part of this activity, I have interacted extensively with all types of fiber product manufacturers around the country and solved ***hundreds of their problems of applied nature*** in the areas of product design, product evaluation, raw material selection, process optimization, technical troubleshooting, legal defense of products and processes, etc. A significant part of my funding support came from the private industry.

Expertise in Statistics and Advanced Data Analysis

Extensive exposure to Minitab and SAS statistical packages and EXCEL data analysis tools; Expertise in using experimental design, data visualization, data programming and charting tools; Analysis of univariate and multivariate data sets for business and research purposes using statistical tools such as multiple regression, cluster analysis, factor analysis, PCA, etc.; Knowledge of Tableau, Python, SQL and R; Critical thinking skills; Preparation and presentation of effective data analysis reports to decision makers.

Expert Testimony Services

Served as a field expert in more than 48 litigations (court cases) involving fiber/polymer/textile products and their manufacturing technologies. Presented expert testimony in federal, state, and county courts in eight different states. Helped to solve four murder cases that involved fiber evidence for conviction/release. Also helped to solve three rape accusations based on fiber transfer evidence.

Accomplishments

- Completed more than 220 applied research projects for the manufacturers and distributors of fiber and polymer products based in multiple states of the US. 20% of projects completed involved data analysis and data-based problem-solving.
- Presented at 198 national and international conferences around the globe.
- Published 65 research papers in refereed engineering & technological journals.
- Managed six different characterization labs and three process technology labs for 20 years. Upgraded four characterization labs by adding new equipment (SEM, set up for X-ray diffraction, X-ray fluorescence, Spectrometry, Rheology, and Thermal Analysis).
- Served as a faculty member in charge of laboratory safety for 12 years (24 labs in 4 buildings).
- Served as an expert witness in 48 litigations involving issues related to raw materials, finished products, and manufacturing technologies. Testified in courtrooms across eight different states within the US.
- Resolved dozens of product/material-related disputes through independent testing.
- Conducted failure analysis, identified root causes, and suggested remedies.
- Has been serving as Chairman of the AATCC Statistics Committee (RA 102) and as paid AATCC Statistics Consultant since 2003).