



Monthly Magazine by
Textile Engineering Society

PROFESSOR'S COLUMN

Professor. Rabisankar Chattopadhyay

Sir, starting off with your early life, tell us about the experience of your undergraduate degree (BSc) ?

I passed out from the University of Calcutta in 1977, it was a very small college with only one department (150 students in the whole college). Since I belonged to a family with a teaching background and hence, I desired to be a teacher so I decided to come to IIT Delhi for MTech in 1978

As you know there is a certain stigma attached that being in textile is not as valuable, what made you go for it?

Textile wasn't a choice, I took up whatever was offered, but I did reject civil once because job offers in textile used to be very good in those days and relatively easy to get those days in cities focused on textile production like Ahmedabad and Bombay etc.

You organised a training programme in 2003 about textile ropes and cordages, can you tell us key features of it? Also, are you organising any programme in the present time?

I was made chairman of a committee on textile ropes and cordage under the Bureau of Indian Standard(BIS).After attending some meetings I realized that people there didn't have much knowledge about textiles, so I decided to start some seminars or short term courses. Since ropes and cordages are very interesting and useful parts there was a need to enhance their knowledge about the same.



As we know you were a part of different institutes so; can you Differentiate your undergraduate experience with postgraduate experience at IITD ?

As I came from an unrecognized college, IIT Delhi was a huge change for me, where I saw people coming from different parts of the country so I got to know a lot of things by staying in the hostel. I was very much fascinated by the quality of teaching by highly qualified professors.

Having so many available options in the Textile field, what made you opt for yarn manufacturing?

Textile is an interdisciplinary area, where two main parts are chemistry of textile and other was manufacturing. As I wasn't good at the chemistry part so I decided to go for the manufacturing part.

You were awarded with the best oral paper presentation award in RuTAG 2018, about "Redesigning the humble NMC (New model charkha) ", what makes it unique and different from others? How does it work?

Charkha is a major area. Khadi department is there in all states. Khadi has existed for a long time. I visited many parts of the country mainly Rajasthan, M.P. and Maharashtra etc. Charkha is the starting point for yarn manufacturing in villages. Unless yarn is good, fabric won't be good. Main aim was to reduce the amount of work villagers have to use to run the charkha. GoI took on a project to make a lighter charkha. The project was about the ergonomic design of the charkha. Charkha works with leg power not hand power, giving a comfortable position to the operator. Made it pedal operated charkha, and improved the gear ratios.

In this new Era of technical textile , How is yarn manufacturing supporting the new development ?

Technical textiles being manufactured today are made using synthetic, high-performance fibres. The yarn has to play a dominant role as yarn decides whether fabric is knitted or woven. All the different types of fabrics are engineered using these different types of yarns.

According to you, what are your expectations for new labs in regards to new instruments and machines due to CoVid-19 ?

Many students transit from textile to other industries/corporate sectors, what is your opinion on it and what will you guide to those who choose a different path?

Textile is a manufacturing industry sector. Any manufacturing sector can't pay as well as the IT sector. So, if someone is driven by money, IT is a better aspect but if someone wants to stay connected to engineering, then Manufacturing is a very good choice. It depends what kind of a life you want. IT sector jobs are in the cities whereas Manufacturing sectors are in small towns. It depends on a person's personal choice at the end. Both the sectors have a lot of scope.

Is our department planning for any new plans/projects for students in this online era? It's very difficult in these times but are there any measures for this new normal?

The department isn't satisfied or happy, if you students aren't in front of us what is the charm of teaching. There has to be eye contact between student and teacher to actually understand. We are forced to use online teaching. Biggest problem is with conducting labs. There are many other things other than academics which matter in your future life which students will not have enough time to learn.

Labs aren't going to change, when CoVid is over, you'll come back and do all your lab work, things will be back to normal. I hope that the campus starts in offline mode as soon as possible. The department is always thinking how to improve labs, and how to make the content of practicals more interesting. This is for even theory courses. We are making you industry ready and course content changes according to industry needs.

RESEARCH SCHOLAR

Pramod Manikant Gurave
M.Tech, Ph.D. (pursuing), ASDC (UK)



What made you choose textile as your field of interest?

I was born and raised in Mumbai, a city with a long and illustrious history in the textile industry. My family has a partly textile background, which is one of the reasons I chose textile as a career. After earning my licentiate and bachelor's degrees from VJTI in Mumbai and DKTE in Ichalkaranji. Then I worked for DyStar, a Singapore-based MNC. I was able to earn my post-graduate diploma in color management while working for the firm.

What triggered you to start your Ph.D.?

The interest in fiber and polymer chemistry gained and exposure to research I got during the master's program are solely basic foundations for the thought to start the doctoral program in IIT Delhi. In my opinion, a doctoral program is one of the ways through which one can explore the horizons of critical thinking, metacognitive strategies, and personal dynamicity.

What lies in the future of research work in the textile field? How do you see the growth of research in textiles in the future in India?

In the current world, textile is not only limited to the set of warps and wefts but is one of the most advanced materials (from its nano to macro size dimensions) that can be utilized from earth to space applications. Sustainable material development can lead to a bright future in textile research.

Throw light on your work-life as a Ph.D. scholar? How does covid affect your research?

My doctoral research is based on nanofibrous systems for water remediation. The freedom and research facilities provided within the campus are responsible for focused research in a particular area when utilized in a good manner. The pandemic temporarily halted my laboratory work. I utilized the same period constructively in search of further opportunities, research writing, and other interpersonal skills. Now, the conditions are better for research work, industrial activities, and I hope they continue for the whole world.

One myth that you would negate with about textile engineering, which you find most common in society or you also had to face at some point in time.

As I experienced for a long, it is not a myth but less awareness about the scope of the textile sciences. It is the bitter truth that the remuneration offered by industries has drastic variation. But I believe hard work and talent get rewarded well in this field too.

Any piece of advice you would like to give to your juniors about textile field who have a little bit of interests in this direction , but don't have much knowledge and hesitates a bit to pursue this as career.

My only suggestion is to always seek better opportunities through various grants and to develop a holistic approach centered on the product. The field has great entrepreneurial potential where research outputs can effectively be blended with business acumen.

SWATRIC

Swatric, a Textile Start-Up incubated at IIT-DELHI, continue to thrive with their mission to revolutionize Indian domestic textile and garment industries in commercializing new and competitive categories of smart and functional products using state-of-the art technologies.

They carry out extensive research and development in all the sectors ranging from Design, Engineering, Prototyping, Testing and Standardization to Manufacturing with the aim to deliver the best products and make best use of time and resources available to them

Serving a True and unique purpose, Swatric has recently collaborated with the Flag Foundation of India to develop a Top-notch and advanced textile solution for the national flag of our country. It is being designed with the aim of making it durable enough to withstand extreme weather conditions without being too heavy. Its key properties are Durability, colour fastness and toughness that enable the tricolour to fly in full glory across the length and breadth of the nation.

Swatric doesn't believe in limiting themselves. They continue to create further innovations. E-textile technology developed by them includes the integration of smart sensor materials in garments for non-invasive health monitoring. Such fabric sensor and actuator help to detect the individual's vital signs and retransmit them via wireless sensor technology to provide continuous feedback on the health status.

Shape Memory Textiles developed by them are novel fabrics that respond to the temperature stimulation. This technology can be used by different textile and apparel industries to impart smart functionalities to their garment or textile products such as self-fitting socks, soft actuators, wrinkle free garment, pressure garments.

Functional finishing on textiles represent the next generation of finishing industry, which, make textile materials act by themselves. They have vast experience in imparting functional finishes for textile and garment products like Flame resistance, Protective Finishes, Liquid Barrier, Antimicrobial, UV Protective Finishes, Wrinkle free, Water Proofing Finishes, UV Finishes, etc

Carbon Nanofibers

The sustainable road ahead

Carbon Structures have revolutionized sciences in recent years and will continue to be at the cutting edge of technological developments in the future. Normal carbon fibers have diameters ranging from some micrometers to ten micrometers, whereas carbon nanofibers have dimensions ranging from a nanometers to submicron values. Carbon nanofibers (CNFs) are a one-dimensional form of carbon with enormous promise in a variety of technical fields.

The development of sophisticated engineered materials from cost effective renewable resources is an important component of sustainability. Carbon nanofibers (CNFs) are indeed a 1-d carbon source with size varying from submicron to nanoscale that have several uses in energy storing, catalytic properties, and adsorption. Lignin has recently emerged as a minimal, renewable natural source to produce CNFs.

CNFs' key advantage has been its extremely insignificant diameter, that corresponds to a very large aspect dimensions (its length/diameter ratio is generally in the thousands) and high amount of surface area. It can well be modified on thermal properties as well as chemical properties to amend constructively it's porous volume as well as surface dimensions. Large interfacial areas make treating with metals as well as metal oxides doable, increasing their usefulness. Furthermore, its interface may be designed and synthesized rather readily to incorporate moiety and change their surface characteristics and distribution in diverse environments.

The current scenario lies heavily upon the usage of PAN fibers for the formation of precursor fibers whose generation as well as processing requires heavy usage of energy and is equally dependent on the petrochemical industry.

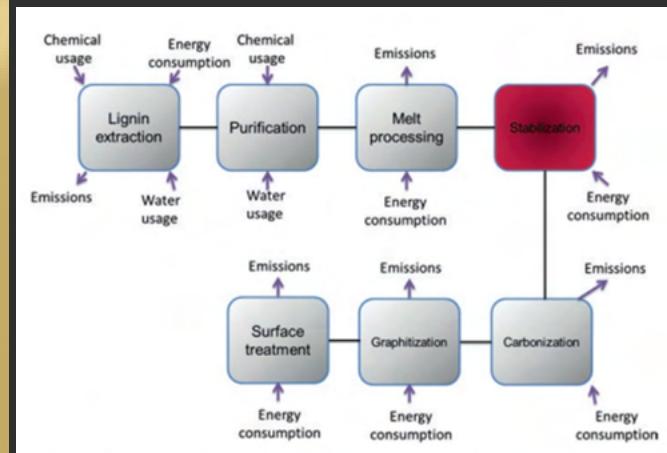


Figure1 : Environmental factors in production of lignin carbon fibers (Source: Simon Fraser University, 2010)

Lignin is a biopolymeric substance which, along with cellulose, is a key component of the skeletal cell walls of structurally developed vegetation such as plants. Several pulping operations, such as the paper and biorefinery sectors, produce large amounts of lignin each year. The removal of lignin done by transforming or varying the lignocellulosic materials (wood) is fundamental to the widespread use in commercial processes.

Usefulness of lignin for CNF's use is founded on its inexpensive cost, easy accessibility, reasonably large carbon amount in its composition (about 65 wt.%), with deprivation of hazardous residues throughout thermal processing.

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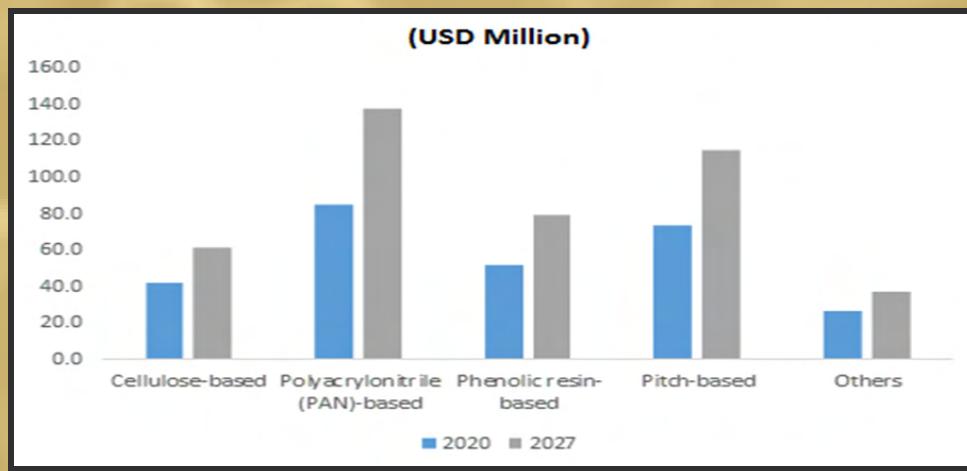


Figure: Activated Carbon Market size, By Material, 2017–2027

Carbon fiber materials are widely used in aviation, turbine, automotive industry, sporting equipment, and infrastructure sectors, and storage technology components. Carbon fibers, despite their better material performance, are not extensively employed owing to the high product price related with PAN expenses. Aside from the economic benefit, utilizing lignin as the precursor material prevents the production of hazardous gases. Hence the material is both economically viable as well as environmentally sustainable.

[Source: "Europe Activated Carbon Fiber Market Forecast 2027 By Application (Air Purification, Water Treatment, Chemical Recovery, Catalyst Carrier), By Material (Cellulose-based, Polyacrylonitrile (PAN) Based, Phenolic Resin-based, Pitch-based), Research Report", June 2021, Research Report ID: GR1881.]

Puzzles and Fun Facts

Cotton can hold up to 30 percent of its weight in water.

More than 200 pairs of jeans can be made from one bale of cotton.

The most expensive fabric to date is vicuña wool with gold woven into it, which retails for a whopping \$1,800 per yard.

Microfiber is 100 times finer than human hair

The word "fiber" comes from a Latin phrase meaning "it looks like threads"

Bamboo can be used to make yarn, thread and a linen-like fabric

The process in which the thread is extracted from the silkworm larvae is called sericulture.

most commonly-used textile in the world is Cotton. It dates back to 3000 B.C. in Egypt.

M	A	X	S	S	D	E	J	E	I	S	C	I	Q	K
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M	S	U	N	I	T	E	D	K	I	N	G	D	O	M

QUESTIONS -

1. CITY JESUS WAS BORN
2. WHAT'S THE TEST MATCH THAT HAPPENS ON THE NEXT DAY OF CHRISTMAS CALLED
3. FAMOUS TV PERSONALITY OF BLACK & WHITE ERA WHO DIED ON THE DAY OF CHRISTMAS
4. FIRST BRAND TO USE SANTA CLAUS IN ADVERTISING
5. THE NAME OF CALENDAR WIDELY USED TODAY THAT MARKS JANUARY 1 AS THE START OF A NEW YEAR
6. ROMAN GOD FROM WHICH THE MONTH OF JANUARY GET ITS NAME
7. WHAT ARE YOU SUPPOSED TO DO WHEN YOU FIND YOURSELF UNDER THE MISTLETOE
8. FAMOUS SCIENTIST WHO MADE YOUR PHYSICS TROUBLESOME , BORN ON THE DAY OF CHRISTMAS
9. HOW MANY REINDEER PULL SANTA'S SLEIGH
10. WHICH COUNTRY WAS FORMED ON JANUARY 1

M. Tech Placement



Himanshu Pundir

**Project Analyst,
Fashion-Tech domain (Flixstock)**

What made you go for data analysis / data industry?

Fortunately/Unfortunately, I didn't get the opportunity as per my expectation in terms of job role and location. Since then I have made my mood to escape conventional textiles and to go into analytics as it was more fascinating for me than textiles (based on my experiences not from someone judgement). Then I have joined Flixstock as project analyst.

How was your journey / experience as an undergraduate different from that as a postgraduate (difference in college, campus, friends, academics etc).

Surely, I had more fun during my UG than PG, comparatively campus was smaller but emotions and memories are great and made friends for life.

Undoubtedly, IIT way ahead in terms of management, academics and learning environment I will be grateful for the mindset and approach that I have developed during PG and will carry it throughout my career.

As it is believed that textile industry doesn't offer a good carrier scope, so beside all these things. What made you go for textiles, and how did you tackled with these controversies. Was it really difficult to get a job in IT industry being from textile background.

Textile Industry offers a good carrier scope but only when you fit in that scope. One must have patience, tolerance to work in harsh conditions in a remote areas of the country. When it comes to choose textile as optic one has clarity about the industry (I didn't had). But I have given priority to the government college over branch. Since then, I only focused to dig out the best from it, rather doubting the choice I modette bit of body text.

What was your & your family's experience when you got an AIR 14

Yes family was quite happy and I was okish with the result as I was expecting it to be in top 5.

Did you tried to get a job directly after your BTech or you were sure about pursuing MTech from the very start.

I was placed in Raymond's during UG, But It was pre-decided to pursue PG before diving into professional world.

What were/are your hobbies or passion. Had you ever tried to do something to make a carrier out of these?

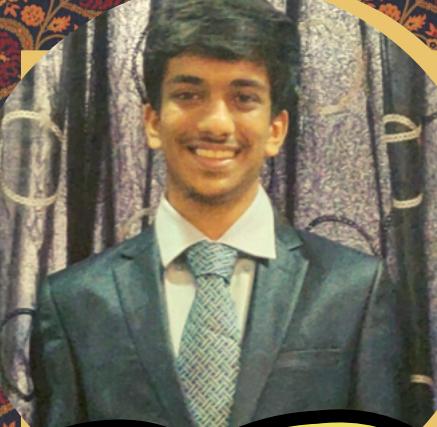
I consider myself as a boring person when it comes to the hobbies. But yeah I really do like being in shape. I once thought to start with fitness and take it further but due to health issues I had to discontinue this path.

Do you have any other future goal other than these things? (for eg: PhD or a job in foreign countries)

No for Ph.D. so far Definitely, yes for foreign country into data analytics field.

What suggestion / tips you would like to share with your juniors.

Textile students are always dicey about their career. What I would suggest do research about the seniors how successful/happy tare they being into textile/non-textile. Professionalism is big bad world, being in college we didn't realize that. Try to bring clarity where you want to head in career and starting working for the same. Most of us want an escape from textiles, If you one of those it should be based on your experience rather then someone advice/perspective. Someone who having patience and persistence textile has so mush to offer. Always make a choice with core of inner you rather influential.



SHUBHAM SHARDA

3rd year internship

FinMechanics

Fourth-year student,

How was your individual experience of college life.

IIT DELHI was the sole reason that I got the finmechanics internship through OCS platform. The test had coding, finance and aptitude questions. Interview was of 2 rounds, first one being the technical round having coding questions and then was 2nd round which was basically a HR round.

Quant questions were pretty basic and for probability questions I've had help from MTL 106. Coding part should be strong.

What are the challenges that you faced as a textile student and how did you end up doing coding, pursuing coding ?

Being a textile student, I hadn't had as much exposure to coding as others but I have done the COL106 course, which proved to be very helpful. In general the internship process is quite difficult for lower branches .So yeah, some problems were faced.

I had a COL100 course in the 1st year. So I knew coding was a thing for me, in the summers of 1 st year, I learned python and had done a few courses . I am also pursuing a minor degree in CS.

What will be the one piece of advice you would give to the juniors of the department?

I'd suggest the junior students trying for a foreign internship to start early as the earlier you start the more vacancies are there and the better are chances of selection. Make a good CV, don't just put out random things. Mention those points that align with the area of the profile you are applying for and start early and mail hard, don't expect to get an intern in 20 - 30 mails. People are sending 500 emails to get the internship; some people don't even get a reply in the first few emails so the acceptance rate is low, but you have to just get on with it if you want it; hence losing hope should not be an option.

How has Covid affected your internship?

Sadly Covid affected both of my internships, i was supposed to go to Australia as an intern and in 3rd year, I was supposed to go to Mumbai for FinMechanics but i wasn't able to go. But looking on the bright side, Covid gave us much more time in general than college time. I tried to get more experience and courses.

What does an ideal cv looks like for this role?

For technical roles CV, Extra Curricular and POR section is not relevant. They are important for consulting roles. Don't focus on this part. CGPA is a very important factor. Have at least 7.5+. After that, focus on the coding test and start preparing. In case you have any scholastic achievements, they are also important. If you have done coll06 courses, then write them in projects,(their assignments).

Can you dig deep and give us a brief overview of your job as an intern?

My role in this internship was that I'm working for a client , an Indian bank, so usually trades and deals happen. My main work is in Java and C++, basically taking data from a bank and migrating to a finmechanics environment and applying logic. The people from the company were very helpful and helped me to give a basic understanding of the finance work.

If you got to time travel back and were given a chance to give one advice to your younger self what it would be?

One piece of advice I would give to my younger self: Be calm and don't take much stress, have a cool and calm mind .Don't let up boil all the stress in your head.

Advance Sitting

Rupali Dhiman

Few words for Aspirants



Tell us about your experience in the textile technology industry and what inspired you to seek a career in this field.

What suggestions do you have for coping with stress?

I have been in this field for 11 years. I did my bachelor's degree from Government Engineering College Sunder Nagar and completed my master's degree from IIT. I am currently a Ph.D. research scholar at the "Department of Textile and Fiber Engineering," The Indian Institute of Technology, Delhi. When I first started my journey, I took textile engineering because of its distinctive nature. I initially planned on changing my branch in the future. But when I came to IIT, I rediscovered the domain of textile. People are working in fields like Ballistic Clothing, Nano Fiber, etc. People have the general perception of textile engineering as a less engaging branch. Still, specialization in various areas of this branch is much more exciting and has significant research opportunities.

What activities did/do you participate in outside of academia and research?

Many of my friends experimented with meditation and yoga. I encourage that Btech students to join a group of their choice to relieve stress. Painting is a release for me. In my spare time, I like doing art. It assisted me in calming my anxiety and seeing things from a different viewpoint. Breaking up your frantic daily routine might be quite beneficial. Lastly, I recommend having a go-to person. For me, it's my father. I've always discussed everything with him since my MTech year. It can be anyone, a batchmate, a senior, or your parents.

Do you want to share a reminiscence from your time at IITD?

I have many fond memories of my time at IIT Delhi. Professors from my former college visited IIT Delhi at one point. They were taken aback by how much I had changed and how much my personality had evolved. I was even invited to give presentations to my previous college juniors. My most vivid memory, though, is of the day of my MTech graduation. It felt like my entire family was graduating, not just me. It felt like I had reached a milestone and that all of my efforts and hard work over the years had been worthwhile.

Would you like to give some insights on life to your juniors?

"83 lakh yoni ke baad 1 insaan ka roop milta hai," according to Hindu mythology. You were fortunate enough to be born as a human being. I encourage my juniors to make the most of their lives. You will have no regrets. Academic is a vital part of our lives, but you have to understand it is just a part. In life, you have a lot more to discover. Secondly, don't stress over anything for too long. Every stress is momentary, all you have to do is fight through it. Once you hit rock bottom, the only way is up. Just believe in yourself, and you will receive the recognition you deserve.

Internship Stories - 2nd Year Internship at INSEAD Business School, France

AKARSH GARG, 2nd year

Tell us about your college experience till now , things you explored , clubs you liked, memorable experience .

I have been part of IIT Delhi debating society where I was a convenor in my second year . Also I was a part of OCS IIT Delhi as an executive during my sophomore. A great majority of my time and effort outside the academics have been focused on debating primarily due to my interest and the great debating culture I got in my hostel. At OCS I felt very glad to be part of a process that helped our seniors secure interns and placements. Talking about the college life it has been nothing short than a roller coaster and we all are eager to get back to the campus . I would say the best moments for me would be the hostel life , the friends and bonds that you make , the endless late night discussions you have on anything and everything and when you look in hindsight , these are the moments that you remember and cherish the most .

What motivated you to go in the domain of business research and how did you target your intern ?

Right from my school days I was inclined towards the field of finance and management and that didn't change even after coming to IIT Delhi . I was clear in my head that I want to explore the domain of finance and management . I did an online course 'Machine Learning A-Z' from udemy , which helped me getting into the domain of business research and analytics . And since it's not a core software job , you need to be familiar with some fundamentals of economic theory and how global economy works . Also, prior to this intern I did six interns in research from various universities including Columbia Business School and Harvard Business School .

What advice would you like to give to your juniors ?

My advice would be to explore everything that you feel you may have an interest in because that is the only way you can truly discover your interests.

Can you give a brief overview of your internship and any advice for students who are looking for an internship in this domain ?

I am currently doing an internship at INSEAD Business School , France for which I got a scholarship from the government of France . It's on corporate governance where we are essentially using principle of technology and organisational management to find out how employees react to certain kind of news flow in a company , how executives maintain a better environment within a firm , so and so forth . My advice and suggestion would be while looking for an internship don't cold email several professors just because you think it's a volume game , it's definitely not a volume game . Do research from your side and personalise your emails . But first and foremost get clarity about what you want to do and seek opportunities that are relevant to your interest . And if you are looking for opportunity in the corporate side , I believe networking plays an important role . But that take times and concentrated efforts to not only build connections but to understand what the other person does and prove them your worth.

