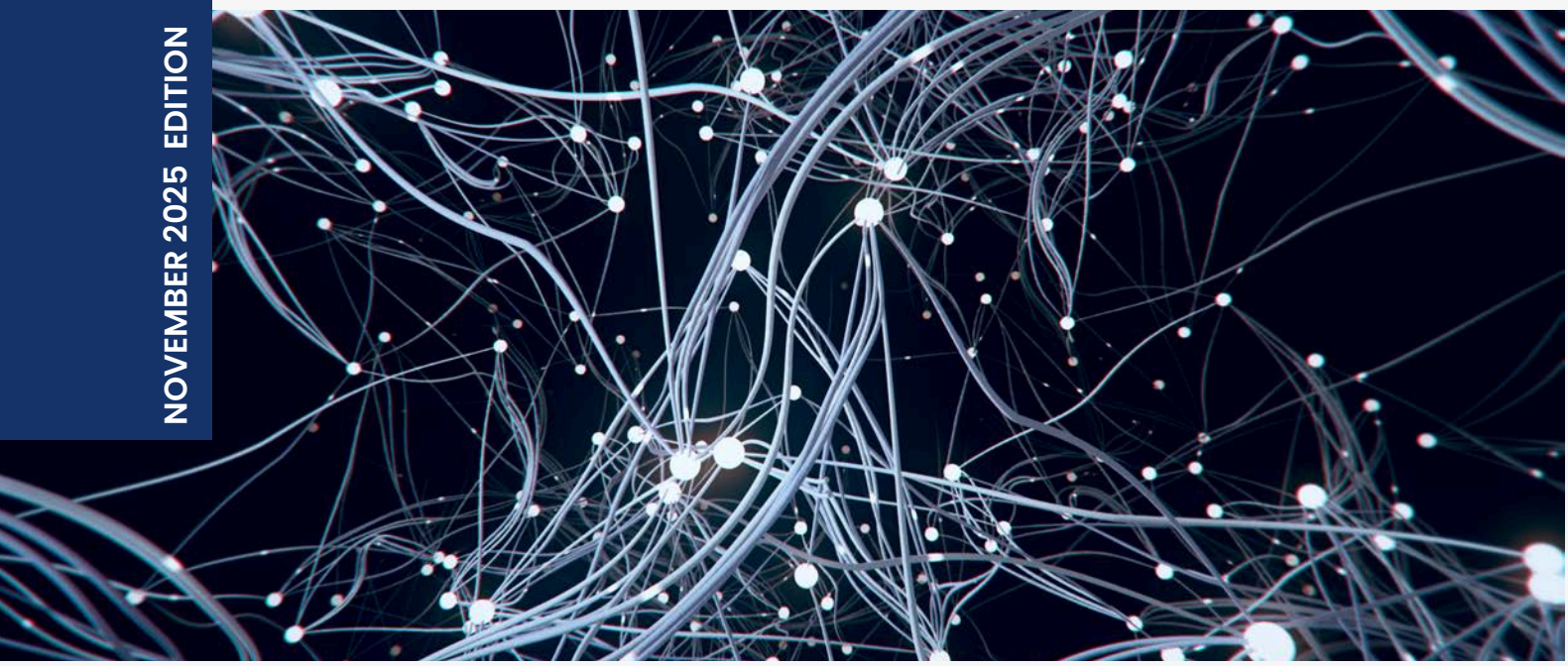
COLLECTIVE MINDS

MEA NEWSLETTER

NOVEMBER 2025 EDITION



quick peek

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President's Message from Manoj

Moving Forward Together

Dear MEA family members,

Life's surprises can be some of the greatest things that happen to a person. Some events can make one's life take a turn in an unexpected direction. I want to share an inspiring story of an MEA member where a single alphabet, not even a full word or conversation, gave a direction not only for her but also opened up the door of a prestigious organization to all women engineers in India. Discover this amazing and encouraging story on page 8 of the newsletter; I won't ruin the surprise here.

I am delighted to report the successful execution of this year's fundraising event, Keraleeyam, celebrating the heartbeat of Kerala, a mix of various art forms from different parts of Kerala. Also I want to thank our sponsors and our members and well wishers who generously donated for the noble cause of scholarship.

The MEA Fusion Fest delivered another year of excitement and competition, highlighted by new events.

The annual MEA Badminton tournament, a much-anticipated event for local Houston players, wrapped up as a highly competitive and undeniable success, proving to be a true feast for every sports enthusiast who watched.

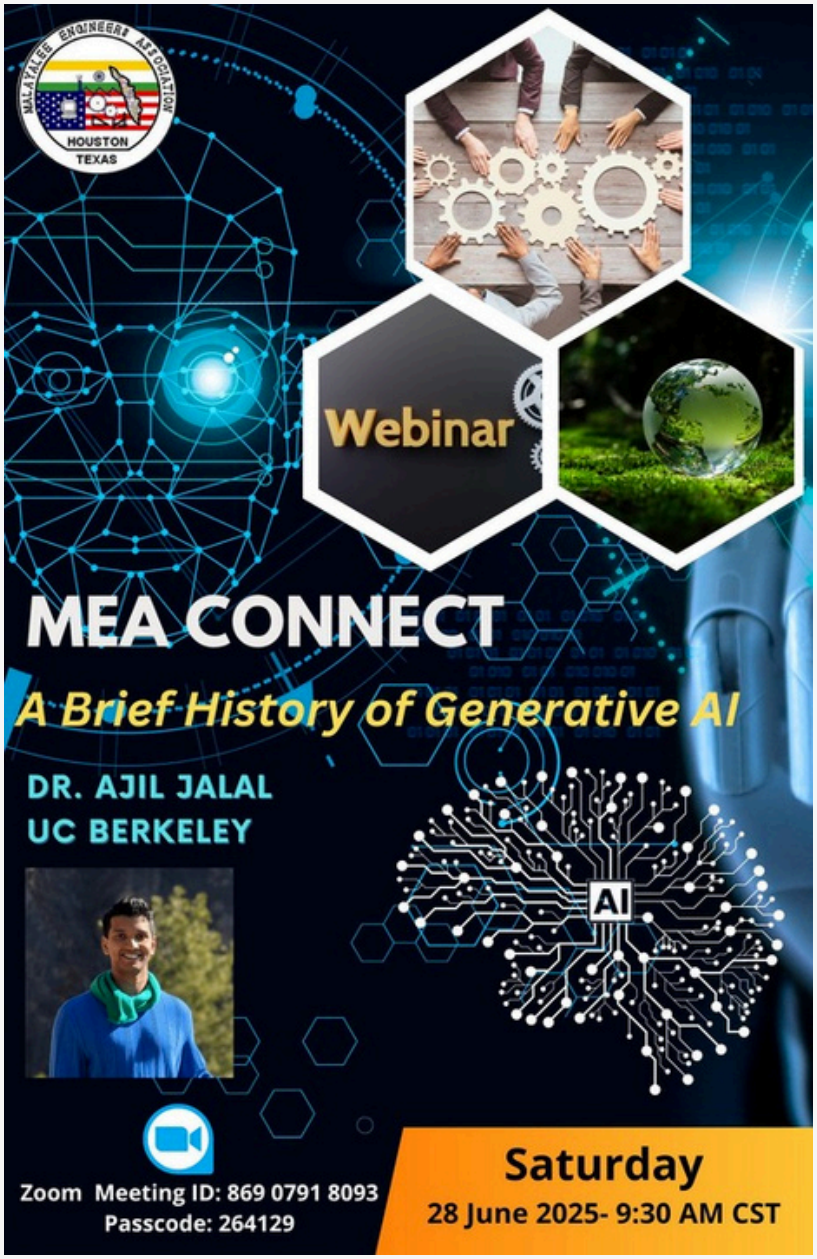
I want to thank the whole MEA family for enthusiastically participating and supporting all the events. Also want to acknowledge the volunteers who wholeheartedly engaged to help run different tasks.

Active member participation is the bedrock of the MEA's strength and success. We encourage all members to enhance our community by engaging in events, with innovative ideas, and help MEA grow by inviting fellow engineers to join our community.

Please continue to provide your feedback and suggestions which will help improve and guide us to new opportunities.

Manoj Anirudhan
MEA President

MEA CONNECT WEBINAR



Dr. Ajil Jalal
UC Berkeley

https://scholar.google.com/citations?user=ePC7IC0AAAAJ&hl=en

Dr. Ajil Jalal, a graduate from IIT Madras, completed his PhD under Prof. Alexandros G. Dimakis at UT Austin in 2022, followed by a three year postdoctoral fellowship at UC Berkeley. His research focuses on generative models, information theory, and algorithm design and analysis. His work has bridged together generative models and signal processing, leading to fundamental breakthroughs. He is the Head of Research at iXi gAI and a co-founder of Pothos AI

Title: A Brief History of Generative AI

This talk traces the roots of generative modeling from early probabilistic frameworks to the rise of deep generative models like VAEs, GANs, diffusion models, and transformers. We'll explore key breakthroughs, architectural innovations, and the surprising intersections with fields like compressed sensing. Attendees will gain a nuanced understanding of how foundational concepts have shaped today's most powerful AI systems—and where the field is headed next.

Watch on You Tube: https://www.youtube.com/watch?v=antq8090a-w

FOUR PILLARS OF ENGINEERING

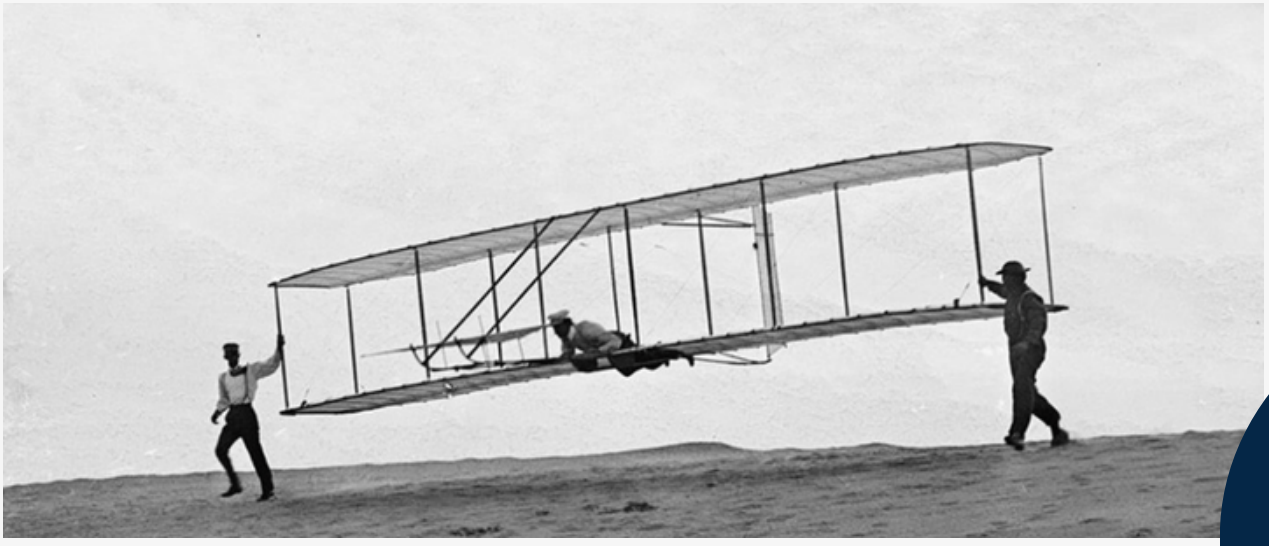
BY NAJEEB KUZHIYIL

Engineering is everywhere! The house we live in, the roads we drive on, and the cars we use are all products of engineering. So are the fertilizers that grow our food, the medicines that treat our illnesses, and the clothes we wear. Airplanes, rockets, and satellites are also highly engineered marvels. Engineering profoundly influences our daily lives and the quality of life on our planet. It is a great profession that offers opportunities to apply human creativity, contribute to the greater good, and build a rewarding career.

Many people have a general understanding of what engineering is, while others may still wonder what exactly engineers do and how they approach their work. If you belong to the first group, this article will serve as a refresher. If you're in the second, it will provide a simple and structured way to understand the essence of engineering.

Engineers conceive, design, implement, and operate (CDIO) machines, buildings, plants, and systems. Dr. Edward Crawley of MIT has been a major advocate for the CDIO framework and curriculum, now adopted by many engineering colleges worldwide. While these institutions do an excellent job of teaching engineering systematically, it helps aspiring students to first gain a broad overview, so they can better appreciate their coursework and projects.

To bring clarity and simplicity to this understanding, I developed a framework called Four Pillars of Engineering. This approach helps students learn engineering in a structured way and ignite their passion for the subject.



About the Author: Dr Najeeb Kuzhiyil is currently a Staff Scientist at Exxon Mobil Corporation, USA. Prior to that he was a Senior Engineer at General Electric Company. An expert in fuels, lubricants, and engine combustion, he has a PhD. in Bio-renewable Resources from Iowa State University in the USA and a Master's degree in Combustion and Energy from the University of Leeds in the United Kingdom, where he was a Shell Centenary-British Chevening Scholar. He is passionate about education and authored a book, Spirit of Engineering that explains the basics of engineering through a story. He has published his scientific research in many prestigious journals and holds many US patents.

FOUR PILLARS OF ENGINEERING

Creative Writing

The four pillars of engineering are:
1. Methodical Approach
2. Practical Skills
3. Abstraction (Math and Science)
4. Creativity

Methodical Approach

Engineers follow a methodical approach to solving problems and designing solutions. The process typically involves several key steps: define the problem, conduct background research, establish requirements, develop potential solutions, build and test prototypes, iterate to optimize the design, and finally, document and communicate results. A general engineering methodology is shown in Figure 1.

In engineering, defining the problem precisely is crucial. For example, designing a car could involve widely varying goals such as power, speed, comfort, or luxury, each leading to different materials, costs, and design choices. Clearly specifying performance targets, customer needs, and price range helps engineers focus on the best solution. For example, the engineers in Toyota don't have the same requirements and preferences as the ones in Porsche do. Background research and well-defined requirements set the foundation for successful design and testing. Throughout this process, thorough documentation of designs, test results, and lessons learned supports improvement, troubleshooting, and future innovation.

Practical Skills

The second pillar is practical skills. To understand real-world problems and design effective solutions, hands-on experience with materials, mechanisms, and systems is essential. Even when learning engineering theory, a practical approach is indispensable. Cognitive psychologists have shown that humans learn best by progressing from concrete experiences to abstract concepts, through reflection and active experimentation.

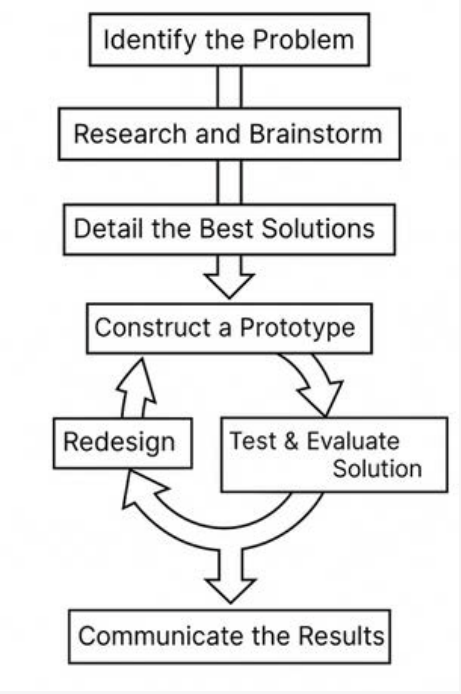


Fig. 1. General Engineering Methodology

FOUR PILLARS OF ENGINEERING

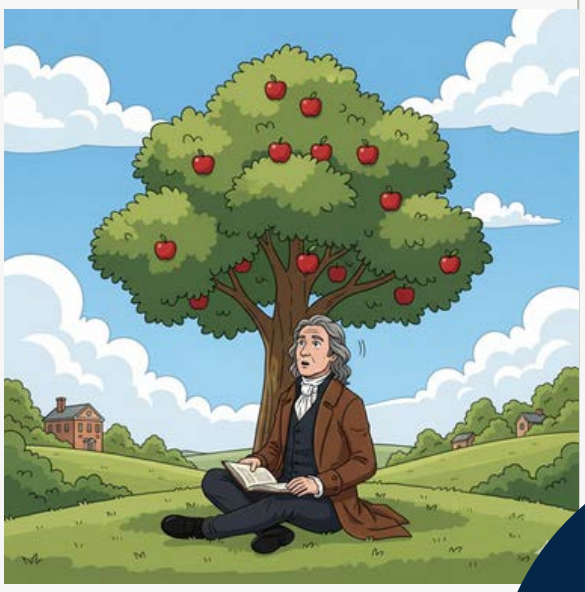
Creative Writing

Building and testing prototypes naturally demand practical skills. Everything that is engineered must function as intended. So, if you want to be an engineer, tinker with things, build with Legos, fix your plumbing, experiment with electronics, and use computers to create working prototypes. This is how you develop the ability to build, repair, test, and innovate effectively.
A classic example of how practical skills can drive success is the story of the Wright brothers. They began as bicycle mechanics, yet when they joined the quest for human flight, they competed against scientists and engineers with far greater resources. What set them apart was their hands-on expertise. They could build their own machines, test them personally, troubleshoot issues, and design meaningful experiments. Their intuition helped them realize early on that the challenge of flight was primarily one of control, not lift. By perfecting a three-dimensional control mechanism, they achieved what others could not. And when they couldn't generate enough lift, they built a wind tunnel to test different wing geometries, and found the optimal design.

To be truly successful, engineers must be able to touch, feel, and understand the machine, structure, or process they are working on, using their practical skills to bring theory to life.

Abstraction

The third pillar, abstraction, gives engineering its wings to soar. What does abstraction mean here? Simply put, it's the ability to represent physical phenomena using mathematical and scientific models.



Humanity has made tremendous progress over the last four centuries, largely due to the advent of modern science in the 17th century. Beginning with Isaac Newton, we learned to translate physical phenomena into mathematical equations.

Of the nine million species on Earth, many know how to push or pull to move an object. An ant carrying a grain of Cheerios, a dog kicking a can, or an elephant lifting heavy logs; all instinctively understand this. Yet humans are the only species capable of calculating exactly how much force is required. We can design engines, accelerate cars precisely, and even compute Earth's escape velocity to send rockets into space and bring them back safely. It all began with Newton's laws of motion, where he defined force as the product of an object's mass and its acceleration, the famous equation F = ma.

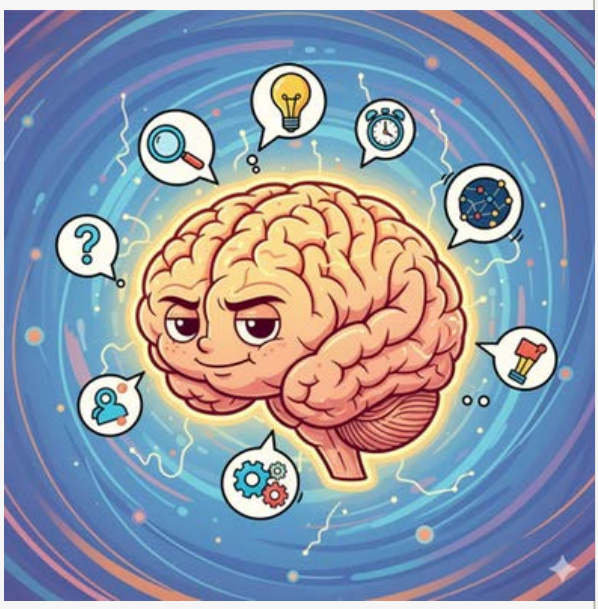
FOUR PILLARS OF ENGINEERING

Creative Writing

Abstraction allows engineers to describe the transfer of heat, the flow of fluids, the behavior of electrical currents, and the forces on beams and columns, all through equations.

An engineer must be able to apply math and science to design and build products and processes, and to troubleshoot problems using sound analytical reasoning.

Creativity



The fourth pillar is creativity.
Many people associate creativity with artists, writers, and sculptors, but not with engineers. They assume engineers are purely methodical, driven by logic, equations, and structured processes. But in reality, engineers are among the most creative people on the planet.
Theodore von Kármán once said, "Scientists discover the world that is; engineers create the world that never was." There's no better way to express it. Our planet didn't come with cars, roads, bridges, buildings, airplanes, or rockets; these were all born in human minds and brought to life through engineering.

I urge every aspiring engineer to embrace their creativity. You have the potential to create things the world has never seen before.

Conclusion

The Four Pillars of Engineering provide a simple framework to understand and practice engineering. Mastering each pillar is vital, though individuals may excel more in some areas than others, what matters most is learning to use all four effectively.

If you are already a practicing engineer, I wish you continued success. And if you are an aspiring engineer, welcome to the club!

MISTAKEN FOR A MAN: A CHEMICAL ENGINEER'S JOURNEY FROM KOCHI TO DELHI, 1970S

BY FATIMA KADIR PILLAI

Creative Writing

In the summer of 1972, as monsoon rains drenched Kochi, a letter arrived that would quietly change the course of her life. It came from Engineers India Ltd, headquartered in distant New Delhi. The envelope, crisp and formal, was addressed in stark type:

Mr. T.A. Fatima

She stared at it—half amused, half stunned. Mr. T.A. Fatima.

They had seen her name on a list of the top three graduates from Trichur Engineering College—just as they had with the top three from engineering colleges across India whom EIL had chosen to call for tests and interviews. In a male-dominated field, it hadn't occurred to anyone in HR that T.A. Fatima might be a woman.

She was the only woman in her chemical engineering class. One of the very few in her conservative, rural college. A place where girls were expected to keep their heads down and voices low. Eve-teasing was common, interactions with male students minimal—for modesty, for safety, for sheer survival. At 21, she had done what few young women even dared. But outside the classroom, her future seemed already mapped out: marriage. Her parents had begun arranging brief meetings with potential grooms—engineers or bank clerks with secure jobs in the Gulf. Conversations over tea, guarded exchanges, whispers of her dream to pursue a professional life.

About the Author: Ms. Fatima Kadir Pillai is one of the early female chemical engineers in India. With an accomplished career, climbing the ladder against all odds, she has smashed many glass ceilings. She is one of the early members of MEA Houston.

MISTAKEN FOR A MAN: A CHEMICAL ENGINEER'S JOURNEY FROM KOCHI TO DELHI, 1970S

Then came the letter from EIL. An invitation to sit for a written test and interview in Delhi.

Her family, culturally conservative yet progressive in their own steadfast way, stood at a quiet crossroads. Her father had spent years working tirelessly to build educational institutions back in Kerala, believing deeply that knowledge was the surest path to upliftment. He himself had once made a daring journey—traveling from Kerala all the way to Aligarh in the 1940s to study Electrical Engineering, a train trip that then took five full days. He had always ensured she had strong roots to grow, and now wanted her to fly, to seek her own new destination.

Her mother, who had never crossed the gates of a college, and her grandmother, who had never stepped inside a school, stood like a rock beside her father. They shared his resolve to support her wish to explore this opportunity, to go for the test and interview. Both were glad her father would accompany her to Delhi, a place where they had no family—only a distant acquaintance.

So when she found her voice at last— "Let's go," she told her father— he didn't stop her.

But the neighbors buzzed. "Why now? Let her marry first. She won't last a week."

Still, she packed her modest suitcase, wrapped her long plait in a scarf, and went.

Her journey to Delhi, 1,500 miles away, carried her into a completely new world. From lush, rain-soaked Kerala, where emerald paddy fields and coconut palms shimmered under monsoon clouds, the terrain grew foreign. The countryside was flatter, dustier, drier. People spoke different languages, and many wore fancy dresses she had only seen in films—bright chooridar kameezes like Asha Parekh in the Hindi movies. The food was unfamiliar, the tea tasted different, and everywhere, curious stares reminded her just how far she was from home.

When they reached Delhi, the city overwhelmed her. Wide boulevards thrummed with impatient traffic. Men in coats and boots hurried along pavements. A swirl of Hindi and Punjabi filled the air, hawkers called out in accents that bent words into new shapes, and modern glass towers pierced a smog-heavy sky that seemed a different color than Kerala's rain-soft blue.

MISTAKEN FOR A MAN: A CHEMICAL ENGINEER'S JOURNEY FROM KOCHI TO DELHI, 1970S

The next day, her father took her to the EIL office on Parliament Street, just a stone's throw from the majestic Parliament House. Inside the imposing PTI building, set along a wide, tree-lined boulevard, she stood awestruck by its scale and quiet grandeur.

As they stepped into the reception hall, she almost lost her breath. The polished floors, sleek chairs, plush carpets, and artfully arranged flower vases—it felt like the scene of one English movie she'd watched at her school, St. Teresa's. Smart young men—graduates from IITs and lesser-known colleges—stood in tight groups, their confident chatter drifting through the air, starry-eyed and at ease.

She clutched her letter tightly and approached the receptionist, who seemed straight out of a film herself: bobbed hair, a silk sari in jewel tones, bright lipstick, and an easy grace that made Fatima painfully aware of her own simple synthetic sari, oiled plait, and unpainted face.

Then came the first shock. The HR officer scanned her form and frowned. "We don't hire women," he said flatly.

Her heart thudded. She felt the ground tilt under her feet.

But her father stepped forward, calm but insistent, and produced the letter. The officer disappeared into an inner office. When he returned, his voice had lost its edge. "You can write the test," he said, almost grudgingly. "Just this once."

Inside the exam hall, men turned to glance at her—some with faint amusement, others with frank curiosity. But she sat down, opened her papers, and wrote steadily, refusing to let their stares chip away at her resolve.

The interview panel seemed equally surprised. "You topped your class?" "Yes."

"In Chemical Engineering?" "Yes."

A pause. Then the HR manager half-smiled. "Your name threw us off. We assumed... well, never mind."

She understood exactly. She had gotten through the door because they thought she was a man. But from that moment on, everything she earned would be entirely her own.

MISTAKEN FOR A MAN: A CHEMICAL ENGINEER'S JOURNEY FROM KOCHI TO DELHI, 1970S

She got the job. And with it, stepped into a world that astonished her. The EIL office was nothing like her college. Many of its employees were seasoned professionals from famous oil and gas majors and global engineering firms, experts who had come to India to help build the massive new infrastructure of refineries and petrochemical plants.

The workplace still bore traces of Bechtel India, the American engineering giant that had only recently been nationalized and renamed; Engineers India Ltd. There were structured meetings, first-name introductions, and an unexpected emphasis on merit over hierarchy that made her rethink what was possible.

At first, she was shy, eyes lowered, voice soft—old habits from years of caution. But here, men didn't leer or whisper. They treated her as a colleague, if not quite yet an equal. It was a culture shock—but a welcome one.

Her first boss was calm, composed, quietly powerful, recently returned from Houston to serve India build Oil and Gas infrastructure needs. He was one of many managers from several international giants, here to help India shape its industrial future. He never patronized her silences. Instead, he offered her small openings—reviewing refinery layouts, participating in planning meetings, asking for her views on intricate process diagrams. Under his patient mentorship, she began to grow.

She started speaking up. Preparing harder. Her confidence, once buried under layers of reserve, began to show.

She didn't try to imitate the lipstick or jewel-toned saris of the poised receptionist. Instead, she found her own understated rhythm—a simple elegance, a voice that was gentle but firm. She delivered projects, walked refinery floors, gave presentations to CEOs, travelled the world for technology acquisitions, supported refinery startups, and led process EIL technology groups for refining, aromatic, ethylene, and chemical plants. Each milestone quietly redrew the lines of what was possible for women like her.

Years later, she would keep that letter—to Mr. T.A. Fatima—tucked into the folds of memory, reflecting on life's peculiar, mysterious ways. Not as a clerical mistake. But as a milestone. Proof of how far she had come—and how many invisible barriers she had quietly, firmly, redrawn.

That small fork in the road back in 1972, when she chose to make that northbound journey with her father, would lead to countless other crossings. It led to meeting her husband of 52 years, Kadir, who was also an engineer at EIL. It would lead, two decades later, to MW Kellogg—an engineering and technology company—hiring her and moving them from Delhi to Houston in 1992.

Each decision, each risk taken, opened a new horizon. And perhaps that is how new worlds unfold—by daring to say yes when the heart whispers it's time to grow.

KERALEEYAM

27 SEPTEMBER 2025, ST THOMAS AUDITORIUM

KERALEEYAM

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KERALEEYAM

27 SEPTEMBER 2025, ST THOMAS AUDITORIUM

FUSION FEST

16 AUGUST 2025, INDIA HOUSE

FUSION FEST

WINNERS

Creative Writing
Elementary: Bryan Johnson (1st), John Deepu (2nd)
Middle School: Navomi Nair (1st)
High School: Nihal Kochoth (1st), Mahadev Manoj (2nd), Kalyani Nair (3rd)
Judge: Leslie Mathew

Arts
Elementary: Nia Gijoy (1st), Kate Mathew (2nd), Alicia Hunt (3rd)
Middle School: Bhairav Alayil Praveen (1st), Navomi Nair (2nd)
High School/College: Nihal Kochoth (1st), Kalyani Nair (2nd), Bhadra Alayil Praveen (3rd)
Judges: Naveen Kochoth, Sajan John

Chess
Elementary: Celeste Sashidar (1st), Bryan Johnson (2nd), Nathan Abraham (3rd)
Middle School: Darshan Vinod (1st), Aditya Abhilash (2nd), Namish Nair (3rd)
High School/Adult: Neil Gani (1st), Mahadev Nair (2nd), Abhilash Narayanan (3rd)
Chess Master: John Hendrick

JAM (Just A Minute)
Winners: Noel Gijoy (1st), Darshan Vinod (2nd), Namish Nair (3rd)
Judges: Arun Andrews, Alphonsa Devasia, Steffie Thomas & Nithin Arvindakshan

Carroms
Winners: Gijoy Mathew & Anil Vattalai
Judge: Nitin Arvindakshan

BADMINTON

25 OCTOBER 2025, HOUSTON BADMINTON CENTER

BADMINTON

WINNERS

Men’s Doubles

🥇 Rahul & Ajay
🥈 Jijo & Noel

Mixed Doubles

🥇 Rahul & Leema
🥈 Anit & Sayli

Juniors

🥇 Issac
🥈 Dhev

MEA 2025

SAVE THE DATE

6 DEC
5:30 PM

Euphoria
MEA Cultural Night

Get ready for MEA's grand cultural extravaganza

EUPHORIA 2025! 🌟

🗓️ Date: Saturday, December 6, 2025
📍 Venue: Houston Knanaya Catholic Community Center
(2210 Staffordshire Rd, Missouri City, TX 77489)
⏰ Time: Social Hour begins at 5:00 PM | Cultural Programs start at 5:30 PM

Don't miss out on an evening filled with talent, culture, and celebration!
👉 Use the form to buy tickets and register your performance today!

https://meahouston.org/events/mea-annual-cultural-night-euphoria-2025/

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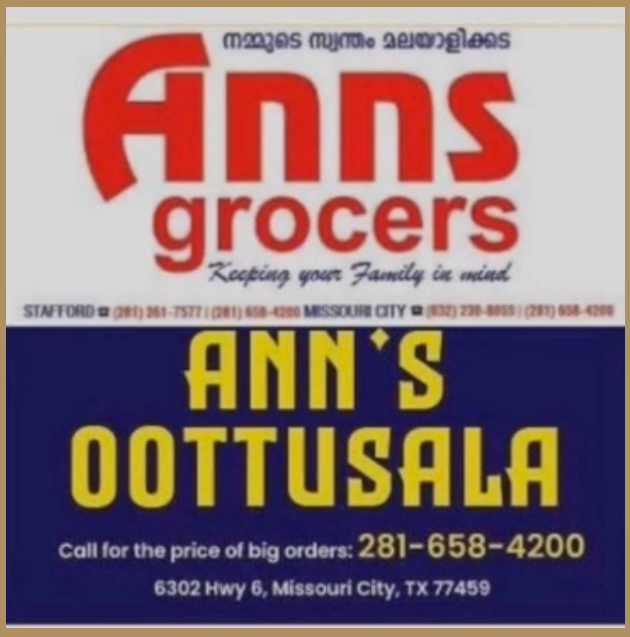

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