

# POWER VISION

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

## MAGAZINE

**Wiring the Future:  
Where Ideas Meet  
Electricity!**

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**Kongunadu College of Engineering and Technology  
(Autonomous)**

(Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai, Accredited by NBA (CSE, ECE & EEE& MECH),  
Accredited by NACC with B++ Grade, Recognized by UGC with 2 (f) & 12(B) and ISO 9001:2015 certified Institution)

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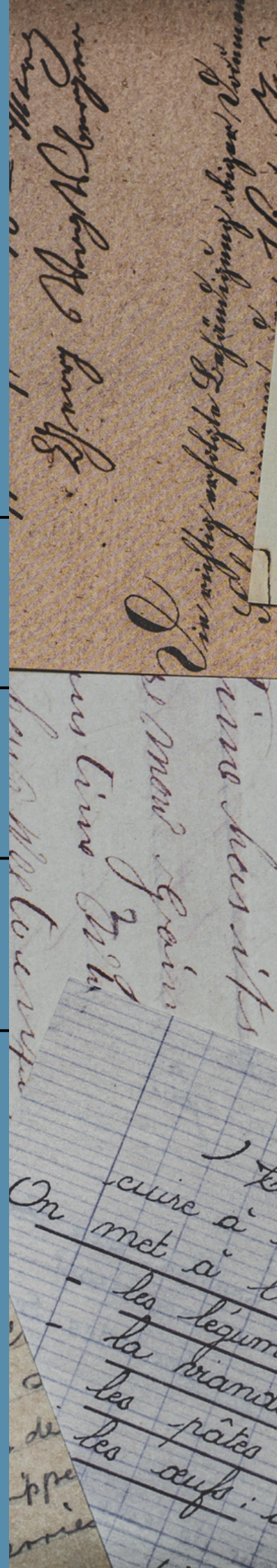
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# Preface

Welcome to Power Vision – Your Gateway to the Dynamic World of Power Engineering! In this premier edition, we invite you to embark on a captivating journey through the electrifying landscapes of innovation, sustainability, and excellence within the realm of power engineering.

Power Vision is not just a magazine; it's a testament to the transformative power of electricity in shaping our world. From cutting-edge technologies to visionary projects, each page is meticulously crafted to inspire and inform, showcasing the latest advancements and trends in the field.

Join us as we explore the forefront of power engineering, uncovering the groundbreaking research, impactful initiatives, and remarkable achievements that are driving progress and shaping the future of energy. Whether you're a seasoned professional, an aspiring engineer, or simply a curious mind eager to learn, Power Vision promises to enlighten and empower.

So, immerse yourself in the illuminating world of power engineering with Power Vision as your guide. Let us ignite your curiosity, spark your imagination, and empower you to make a difference in the electrifying journey ahead. Welcome to Power Vision – where the future of power awaits!

# GROWTH IN PCB DESIGN AND MANUFACTURING




In 2024, PCB (Printed Circuit Board) design and manufacturing growth will revolutionize electronic devices. PCBs form the foundation of nearly all electronics, from smartphones to medical equipment. As technology advances, there is a demand for smaller, more efficient PCBs that can handle increasingly complex tasks.

Technological innovations like 3D printing and AI-driven design drive the growth of PCB design and manufacturing. These advancements enable manufacturers to create PCBs that are not only compact but also more powerful and reliable. For this reason, partnering with ACDi-PCB Design ensures access to cutting-edge expertise and innovative solutions, delivering exceptional quality for your electronic projects.

The trend towards more advanced PCBs is crucial for developing next-generation electronics. These boards support the integration of AI, 5G, and other emerging technologies by providing robust connectivity and processing power. As consumer expectations for faster and more capable devices grow.

*Abirami R*  
**IV YEAR**





# RISE OF 5G AND ITS APPLICATIONS

# 5G

The rise of 5G technology is set to transform how you connect and use electronic devices. In 2024, 5G networks will expand, offering faster speeds and more reliable connections. This means quicker downloads, smoother video streaming, and enhanced connectivity for various devices, from smartphones to smart cities.

5G's low latency (delay in data transfer) opens doors to innovations like real-time gaming, immersive augmented reality (AR), and autonomous vehicles. These applications rely on instant data exchange, which 5G networks can easily support.

Industries such as healthcare, education, and entertainment will benefit significantly from 5G. Telemedicine will become more accessible with high-quality video consultations, while classrooms can offer immersive virtual lessons. Moreover, entertainment platforms will deliver high-definition content seamlessly, enhancing user experiences.

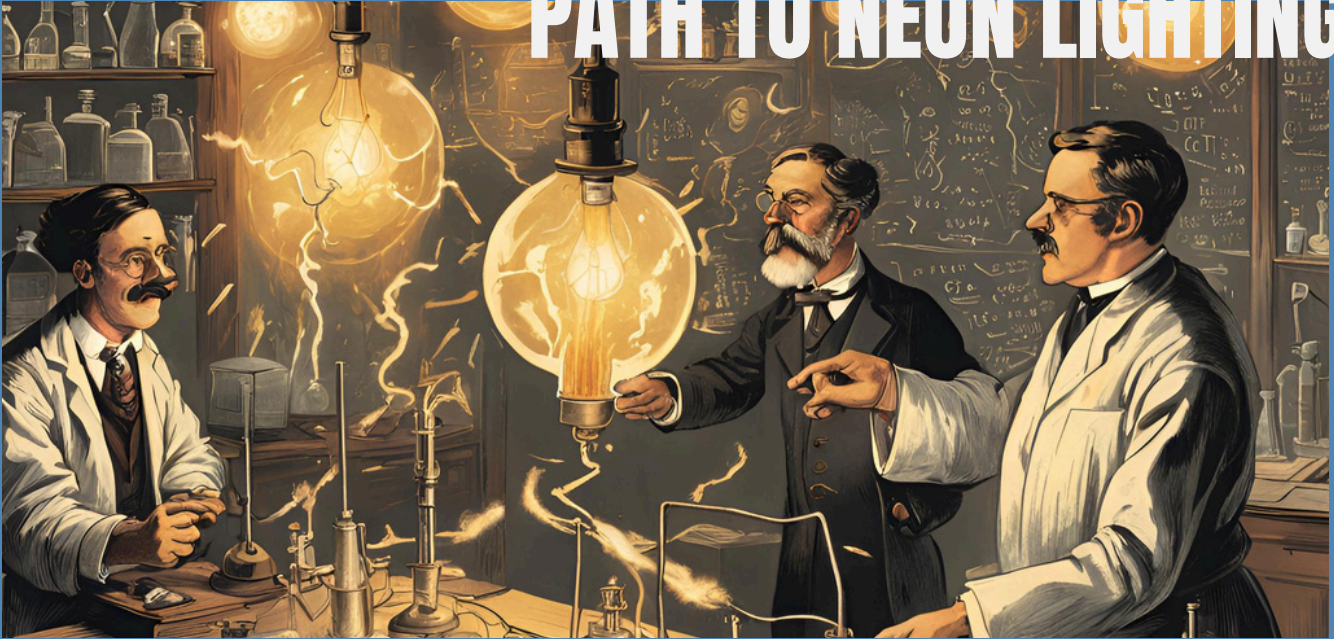
For businesses, 5G means faster data transfers, enabling quicker decision-making and more efficient operations. IoT devices (Internet of Things) will also thrive on 5G networks, creating smarter cities with interconnected systems for better energy management, traffic control, and public safety.

*Midhunkumar S*

**III YEAR**

2

# PIONEERING STATIC ELECTRICITY AND THE PATH TO NEON LIGHTING



In the early 1700s, Francis Hauksbee, a lab assistant to Isaac Newton, made groundbreaking demonstrations with static electricity using an air pump device. Hauksbee developed a glass globe that, when rubbed, emitted a bright glow, capturing the fascination of the scientific community and lay observers alike. His invention was one of the first devices to visibly demonstrate the power of electricity and its potential applications.

The glass globe Hauksbee created was essentially an early electrostatic generator, capable of producing light without fire or flame—a revolutionary concept at the time. This simple but ingenious device laid the foundation for future advancements in lighting. The principles behind Hauksbee's invention would later influence the development of neon lighting and other forms of electric illumination, showing how even modest experiments can spark significant technological progress.

Guhan T  
IV YEAR



# EDISON VS TESLA IN THE BATTLE FOR ELECTRIC POWER



In the early days of electricity in the U.S., the direct current (DC) system was the primary source of electric power. Developed by Thomas Edison through his company, General Electric (formerly Edison Electric), DC was initially favored for lighting and powering homes. However, it had a significant drawback: it was inefficient for transmitting electricity over long distances, requiring power stations to be spaced closely together.

Enter Nikola Tesla, a visionary scientist from Croatia, who proposed the advantages of alternating current (AC). AC could be easily transformed to higher voltages, making it far more efficient for long-distance transmission. Tesla's AC system gained the support of industrialist George Westinghouse, sparking the famous "War of the Currents." This rivalry between Edison's DC and Tesla's AC systems became one of the most dramatic chapters in the history of electrical engineering, ultimately leading to the widespread adoption of AC as the standard for power transmission across the U.S.

Malini M  
II YEAR

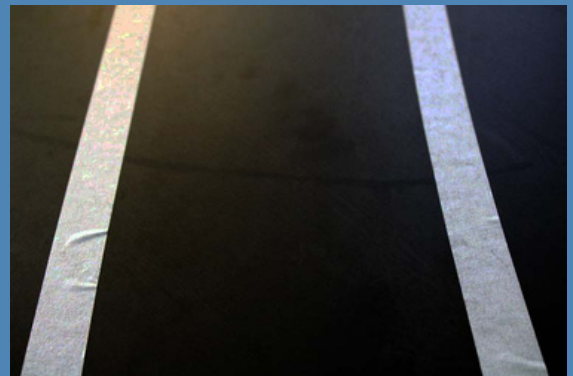
# DIY AUTONOMOUS LANE DETECTION CAR USING RASPBERRY PI AND OPENCV

Self-driving cars are one of the modern world's newest fads. These self-driving cars rely on highly advanced control systems, sensors, actuators, complex algorithms, machine learning systems, and powerful processors.

## Step 1: Perspective Transformation

The first step in this Raspberry Pi Lane Detection is to get the Perspective view of the track. For that let's first take a sample image of the track or you can also perform it directly on the video feed. The original track image is shown below.

Now as mentioned earlier, to get the perspective view of an image, we need to provide the points on the image from which we want to gather information and the points of the output frame inside which we want to display our image. Then these points are stored in NumPy arrays to feed into the Perspective Transformation function.



```
width, height = 320,240
pts1 = [[0,240], [320,240], [290,30], [30,30]]
pts2 = [[0, height], [width, height], [width,0], [0,0]]
target = np.float32(pts1)
destination = np.float32(pts2)
```

```
cv2.warpPerspective(src, dst, dsize)
```

Where:

src: Coordinates of the region of interest for which you want the perspective view.

dst: Coordinates of the output frame inside which you want to display the image.

After getting the points, we get the perspective transform from the two given sets of points and wrap it with the original image using the `cv2.getPerspectiveTransform()`, and `cv2.warpPerspective()` function. The syntax for both the functions is given below:



## Step 2: Image Thresholding and Canny Edge Detection

Now after the perspective view, we are going to perform the Image Thresholding and Canny Edge Detection. But before doing this, we will first apply the Gray Scale filter to the image. Gray scaling is common in all image processing steps. This speeds up another following process since we have no longer to deal with the color details when processing an image. The image would be transformed something like this when this step is done:

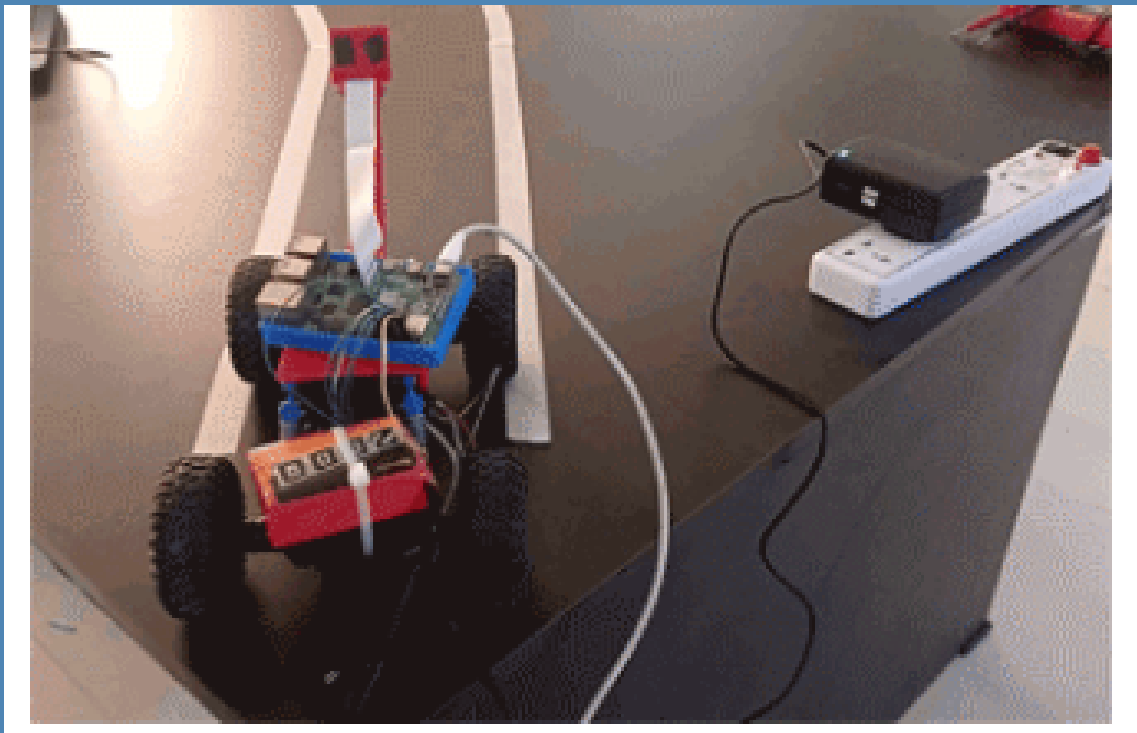
## Step 3: Hough Line Transform

Now after getting the perspective view and applying Thresholding and Canny Edge Detection, in the next step we will be using the Hough Line Transformation to detect the lanes on the track. We will start by finding the center of the frame by using the points of the perspective image that we defined earlier.

## Step 4: Moving the car

Now that we have found the lines and the center of both the lines, we need to steer the car so that it will stay within the lane lines, even better, we should try to keep it in the middle of the lane. So, if the center coordinates are in middle, the car will go in the forward direction without moving left or right. If the center moves to the right, then the car will turn to the left and vice versa.

## Output of the car



# How Does BMW Regenerative Braking Work?

source: BMW



BMW's regenerative braking system is a sophisticated technology designed to capture the kinetic energy typically lost during deceleration and convert it into electrical energy, which is then stored in the vehicle's battery. This process plays a crucial role in enhancing the overall efficiency of BMW's electric and hybrid vehicles, including models like the iX, i4, i5, i7, 330e, X5, and XM. By utilizing the electric motor as a generator during braking, the system transforms motion into electrical energy instead of relying solely on traditional friction-based brakes, which convert energy into heat and waste it. This not only improves the vehicle's range by optimizing energy use but also significantly reduces wear and tear on the brake pads and discs, leading to lower maintenance costs over time. A key feature of BMW's regenerative braking system is "one-pedal driving," where drivers can decelerate smoothly simply by lifting their foot off the accelerator, without engaging the brake pedal. This not only makes driving more intuitive but also maximizes the amount of energy recaptured, further improving vehicle efficiency. The seamless integration of regenerative braking with conventional braking ensures a smooth and comfortable driving experience, with the system also working in conjunction with safety features like anti-lock braking (ABS) and electronic stability control (ESC) for optimal performance. BMW's commitment to sustainability is evident through its continued innovation in this field, with plans to advance regenerative braking technology in the upcoming NEUE KLASSE platform launching in 2025. This platform is expected to feature even more efficient energy capture and storage technologies, making BMW's electric vehicles even greener and more eco-friendly. By continuously refining regenerative braking, BMW is pushing the boundaries of electric mobility, reducing emissions, and contributing to a more sustainable future.

# SOULFUL LINES

## “ உயிரின் போராட்டம் ” “ வீரத்தின் பாணி ”

உயிரின் போராட்டம்,  
சண்டை அறிந்த தேசம்,  
மண்ணின் பணியால் பெருக,  
சுதந்திரத்தின் தேசம்.  
அழகையை நோக்கி வர,  
என் நெஞ்சம் உறைந்தது,  
மாற்றம் வேண்டுமெனில்,  
எல்லோரும் உறுதிப்பட  
வேண்டும்.  
கண்ணீரின் காற்றில்  
மிதக்கும்,  
வீரமாய் எழுந்து திகழ,  
கல்கரியால் திரியாதே,  
எல்லோரும் சங்கம்  
கட்டுவோம்.  
மண்ணின் செழிப்பு  
வேண்டுமென்றால்,  
கல்வியின் வெளியில் கண்டு,  
அடுத்த கட்டத்தை நோக்கி,  
அமைதியாய் கடந்து செல்ல  
வேண்டும்.

Myuri V  
IV YEAR

மண்ணின் மார்பில்  
பதிக்கப்பட்ட,  
வீரத்தின் கதை பேசுமா,  
தெய்வம் போலி அல்ல,  
மனதில் எழுந்த போராட்டம்.  
சிறகுகள் விரித்து உயர்ந்தே,  
இகழ்வு கையால் நின்று,  
நமது பயணம் தொடரும்,  
சுதந்திரத்தின் நம்பிக்கையுடன்.  
கண்ணீர் வரையில் யாரும்,  
தாங்க முடியாத வேலையை,  
நாம் செய்தால் ஒன்றாக,  
எண்ணில் சுதந்திரம் பறக்கும்.  
அழகான நாடு எனக்கு  
வேண்டும்,  
அழகை இல்லை, வீரமாய்,  
வாழ்வின் வரிகளை எழுத,  
என் மார்பில் கதை கொண்டே  
உன்னோடு.

Thirisha V  
III YEAR



# SOUFUL LINES

## “நிலவின் கதை”

நிலவின் ஒளியில் நின்று,  
உறவுகளின் கதை கேளுங்கள்,  
இலக்கியத்தின் எழுத்தில்,  
நாம் சேர்ந்து பாடுவோம்.  
காதல் என்ற இசையின்,  
இன்பம் பயிராய் பூக்கும்,  
மனதில் பிறக்கும் கனவின்,  
அழகு கொண்ட பார்வை.  
கண்ணில் நனவாய் இருக்கும்,  
உருகும் அந்த அழகே,  
உலகின் ஒளியில் திகழ,  
உறவுகள் நமக்கு தேவை.  
நிலவின் கதை கண்டேன்,  
அந்த கதை எங்கள் மைதானம்,  
நம் உறவின் மோகனில்,  
மனதில் இரு நதிகள்  
கலந்தால்.

## “சுதந்திரத்தின் செல்வம்”

சுதந்திரம் என் கண்ணீர்,  
கடல் காற்றில் மிதக்கும்,  
மண்ணின் மேல் பிறக்கும்  
நாள்,  
பெரிதும் எதிர்பார்த்த கனவு.  
என் நாட்டின் பெருமை,  
மனதில் உறுத்தும் போராட்டம்,  
முதல் காலம் நினைவில்,  
வீரம் கொண்டே எறிந்து  
போகும்.  
அழுகையை தகர்க்கும் ஒலி,  
கலவியின் கோபம் தீர்க்கும்,  
எழுத்தின் ஒளியில் கலந்தால்,  
எந்தன் சுதந்திரம் சிறகில்  
பறக்கும்.

Vignesh K  
IV YEAR

Sri Dharshini M  
III YEAR



# ELEGANT STROKES



Infant Steve  
II YEAR

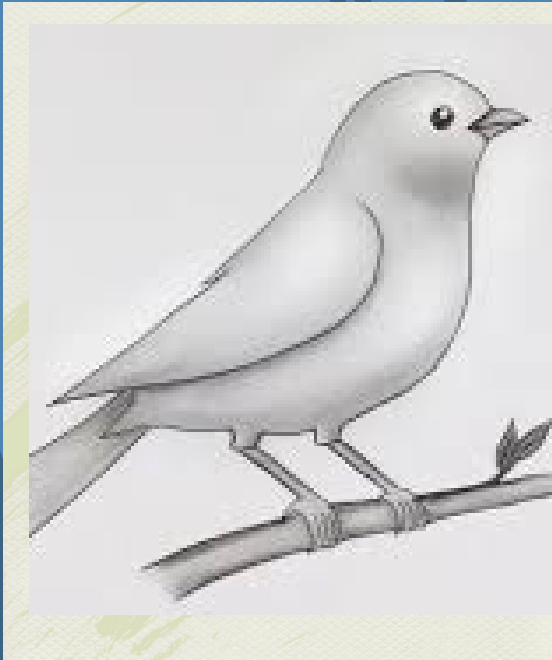


Kishore  
II YEAR



Sundar  
III YEAR

# ELEGANT STROKES



*Jeerva*  
**II YEAR**



*Pavithra*  
**II YEAR**



*Prabhu*  
**IV YEAR**

# EDITORIAL



## OUR TEAM

### **CHEIF PATRON:**

Dr.R.Shankar, HOD, EEE

### **EXECUTIVE EDITOR:**

Mrs.S.Revathi, AP, EEE

### **EDITORS**

S Nivetha	IV Year
S Sudhakar	IV Year
B Sureka	III Year
S Sathish	III Year
R Jeeva	II Year
A Kirubananthan	II Year

# College Vision & Mission

## VISION

**“To become an Internationally Renowned Institution in Technical Education, Research, and Development by Transforming the Students into Competent Professionals with Leadership Skills and Ethical Values.”**

## MISSION

- **Providing the Best Resources and Infrastructure.**
- **Creating a Learner-Centric Environment and Continuous -Learning.**
- **Promoting Effective Links with Intellectuals and Industries.**
- **Enriching Employability and Entrepreneurial Skills.**
- **Adapting to Changes for Sustainable Development.**

# Department Vision & Mission

## VISION

**“To be a pioneer in Electrical and Electronics Engineering and to create electrical engineering experts with social responsibilities, for global industry needs.”**

## MISSION

- **To facilitate the student's continuous learning with the best infrastructure and environment.**
- **To provide the students with skills, knowledge, and opportunities to function as members of multi-disciplinary teams.**
- **To Empower the students towards popular needs of industry, research, and development**
- **To enable the students to learn ethics, values and contribution to the society.**