THE
ELECTRIC TIMES
NOVEMBER, 2022 / Vol 6

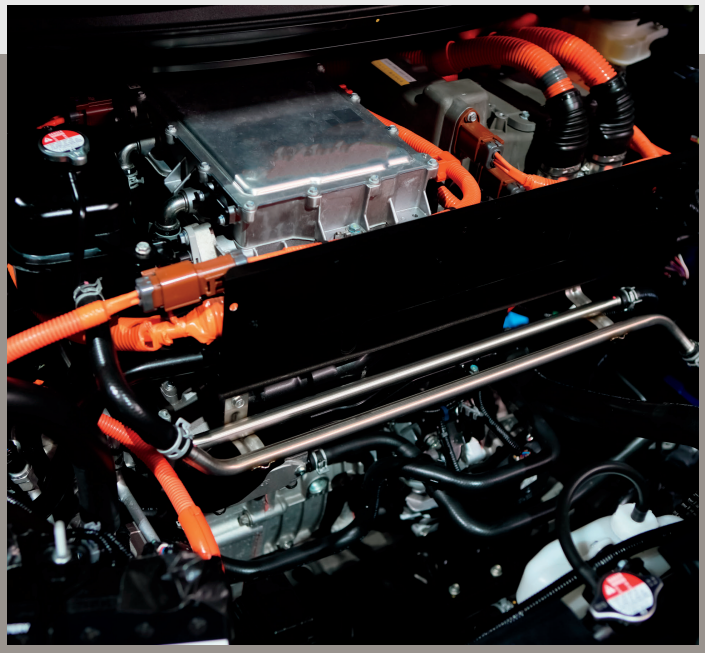
ULTRASONIC MOTORS

An ultrasonic motor, abbreviated as USM, is a new kind of solid state motor, which is propelled by the ultrasonic vibrations of a piezoelectric transducer. It offers arbitrarily large sliding distances or rotations. This class of motors gives out an excellent performance along with exceptional features like compact structure, great variation in its design, non-interference of magnetic field when functioning, power off self brake, low speed, high torque, etc.
The main disadvantage of this motor is the fatigue wearing of stator because of frictional driving technique.

Dry friction is frequently utilized in contact and ultrasonic vibrations stimulated in the stator is utilized to impart movement in the rotor and also to alter the frictional forces at the interface.This modulation in friction permits the rotor's bulk motion without which USMS would fail to function. The friction across the rotor-stator contact interface can be generally controlled in two ways-standing wave vibration and traveling wave vibration.

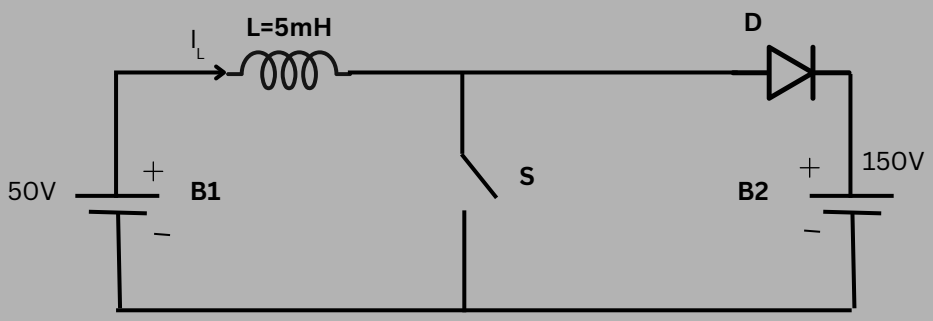
Considering the case of an unusually high torque hybrid transducer USM, it makes use of axially-poled and circumferentially-poled piezoelectric components together to merge torsional and axial vibrations along the contact interface, indicating a driving technique that is categorized between the traveling wave and standing wave driving methods. To understand the concept of USM working principle in simple words, we can say that the ultrasonic vibration is transformed into thrust (Linear USM) or output torque (rotary USM) by the friction between the stator and moving part (Linear USM) or rotor (rotary USM).

USMs are of great interest because of their adaptability of miniaturization when compared to the typical electromagnetic motors. The compact size and high torque of these motors facilitates USMs to be widely used in medical and information systems industry. Its hollow structure serves as a plus point to be used in application in fields like robotics where using an electromagnetic motor for designing a device would be very difficult to meet the specifications. Back in the 1980s, it was Canon (one of the leaders in USM), which made these motors famous by integrating them in their auto-focus lenses for Canon EF lens mount. Thus, camera auto focus lens is yet another common application. The research and development of ultrasonic motors paves new ways to the future to be used in more applications. As with any other technology, USMs also have their pros and cons; however, there is enough room for further studies to get over these drawbacks and make it work even more efficiently



GATE QUESTIONS:

1. A dc to dc converter shown in the figure is charging a battery bank, B2 whose voltage is constant at 150 V. B1 is another battery bank whose voltage is constant at 50 V. The value of the inductor, L is 5 mH and the ideal switch, S is operated with a switching frequency of 5 kHz with a duty ratio of 0.4. Once the circuit has attained steady state and assuming the diode D to be ideal, the power transferred from B1 to B2 (in Watt) is _____ (up to 2 decimal places).



AU ROUNDUP

- Prestigious event by Honorable Prime Minister Shri Narendra Modi Ji along with our CM sir, Governor and many dignitaries was historical and a great success in AU grounds.
- AU having increment in placements which is having live example of 25 LPA package in Commerce and Management studies .
- Andhra University has secured a three -star rating in Institutions Innovations Council(IIC) Ranking.
- Nine girl students are selected for NSS pre-Republic day parade camp-2022 held in Gujarat from NOV 20th to 29th .
- Andhra University has a trademark of giving admission for more than 1000 Foreign students .
- AU Pharmacy research on Java Leaf(Neredu Leaf) is completed and as a result the outcome appeared as Cancer and Alcohol prevention.
- Registrar Prof. V Krishna Mohan Garu has started kabaddi competitions and our Hon'ble Vice Chancellor Prof. P V G D Prasad Reddy Garu has granted 9 Lakh Rupees for kabaddi court .
- Andhra University has conducted Inter colleges Chess Competition by Rector K Samatha and Registrar V Krishna mohan Rao .

EMERGING TECHNOLOGY

VANDE BHARAT EXPRESS TO GET ELECTRIC ENGINE SOON

similar to China, Japan, France, and South Africa, India has also took intiative of high speed trains and named it as Vande Bharat Express which are the fastest in the country.

Recently, the Railways floated a tender for a 1650 km track between Delhiand Mughalsarai at a cost of Rs 1,140 crore. The Railways have t broad gauge networks completely to the electricity network by 2023. In this direction, it has been successful on a 52,247 km route till April next year, out of the 65,414 km network.

The 16-coach Shatabdi train has a locomotive at one end which provides about 6,000 horsepower and eight motorized coaches which provide about 12,000 horsepower to the train which is equal to cleaning a sword.

The Vande Bharat Express offers passengers with aircraft like travelling experience and advanced Kavach technology - an indigenously developed Train Collision Avoidance System.

Every coach is equipped with 32-inch screens providing Passenger Informatiion. The new Vande Bharat trains would have improved features including reclining seats in all classes while the Executive Coaches have the added feature of 180-degree rotating seats. automatic fire sensors, CCTV cameras, on-demand content with wifi Facility, three-hour battery backup and GPS systems to make travelling safer and more comfortable.

Future of Vande Bharat trains

ICF has set a target of manufacturing 75 Vande Bharat trains by August 2023.

Train saves about 30 per cent of electricity with the advanced regenerative braking system. The weight of the train has been reduced by 38 tonnes to 392 tonnes which are made up of stainless steel and it can continue functioning even with two feet of flood waters on the tracks.

In any emergency situation, loco pilot and train guard can easily communicate with each other as well as passengers, the loco pilot of the Vande Bharat Express. There are automatic gates operated by the pilot. The windows are wide, there is more space for the luggage. The toilet installed will be advanced. Most of the parts of the trains are "Made in India" except for a few small parts

INTERNSHIPS

CodeAgon By Trilogy- 2023
ENDS AT : 08 JAN 2023 3:00 PM IST.
https://lnkd.in/d2-qck9U

Trilogy Innovations: Intern hunt campaign
Deadline to Register : 15th Dec, 2022

https://docs.google.com/forms/d/e/1FAIpQLSe4qPIvoq1WogdYvnsKPWOrmUKNbLw9velb_kgIO8IibTKbzg/viewform

PROJECTS

The most important of feature of any home security system is to detect the people who enter or leave the house. Instead of monitoring that through passwords or pins unique faces can be made use of as they are one's biometric trait. These are innate and cannot be modified or stolen easily. The level of security can be raised by using face detection.

https://nevonprojects.com/face-recognition-door-lock-system-using-raspberry-pi/

This system is powered by raspberry pi circuit. Raspberry Pi electronic board is operated on Battery power supply, wireless internet connectivity by using USB modem, it includes camera, PIR motion sensor and a door. Whenever the person comes in front of the door, it recognizes the face and if it is registered then it unlocks the door, if the face is not registered it will raise an alarm and clicks a picture and send it on the registered number

ARTS & STORIES

ART WORK

M Thanusri
2/4 EEE
AUCE(A)

STORY

This is a true story about a woman from India who lived in the Middle Ages and had a pet snake, python, which she loved so much. The snake was 4 meters long and looked healthy. However, one day her unusual pet just stopped eating.This lack of appetite in the snake continued over a few weeks. The desperate woman tried everything she could and offered anything that a snake would like to strangle and eat. Nothing worked, and finally the woman took her loving pet to the veterinarian as a last resort.The vet listened to the woman carefully and asked, "Does your snake sleep with you at night, wrap around you closely and spread out throughout its length?" The woman was surprised and with a lot of hope she said , "Yes! Yes! It does it every day and it makes me so sad because and I cannot help it feel better."Then, the vet said something shocking and most unexpected. "Madam, your pet is not sick; it is just preparing to eat you." Yes, the python wasn't sick but it has been preparing to eat her instead!"Every time, it is creeping and "hugging" you, wrapping around your body, it is checking size to weigh how a great meal you are and how it must be prepared before the attack. And yes, it does not eat, in order to have enough space to digest you more easily," the vet said.

K Bhavya
3/4 EEE
AUCE(A)

NATIONAL UNITY & DIVERSITY

Different castes, languages and races
But United they stand
People from contrasting places
we all live in one motherland

Individuals may have different things to brag.
Some may be wealthy some beautifully Serene
But they all salute to one flag the one in saffron, white and green.

At the borders strive protectors of the Nation
Men not necessarily of the same religion.
They consider themselves brothers by relation
All part of the same region

In demanding times together we endure
We move forward to write our own story,
No matter the fear each other we reassure
And that brings out country glory.

Anirudh Patnaik
4/6 EEE
AUCE(A)

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