



MAGAZINE

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Department of
CSE

Byte Quest



Overhauser Magnetometer

OVERHAUSER MAGNETOMETER



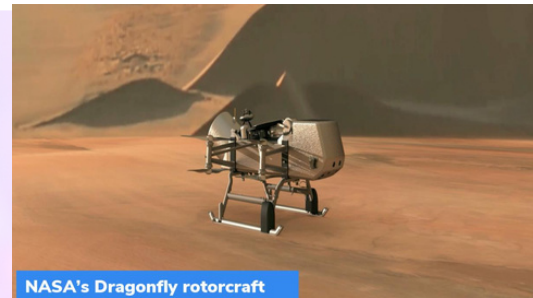
IIT-M Ocean Wave Energy Converter

OCEAN WAVE ENERGY CONVERTER



ChatGPT

CHATGPT



NASA's Dragonfly rotorcraft

DRAGONFLY ROTORCRAFT

Department Vision

To be a center for academic excellence in the field of Computer Science and Engineering education to enable graduates to be ethical and competent professionals.

FACULTY COORDINATORS

S. KOMAL KAUR
(ASST. PROFESSOR)
T. NISHITHA
(ASST. PROFESSOR)

Department Mission

To enable students to develop logic and problem solving approach that will help build their careers in the innovative field of computing and provide creative solutions for the benefit of society.

STUDENT COORDINATORS

MANAS (2/4) CSE C
ANISH (2/4) CSE B
RANESH (2/4) CSE A
CHANDRASEKHAR (3/4) CSE B
SHASHIKAR (3/4) CSE C



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CHATGPT

- ChatGPT is a chatbot powered by artificial intelligence that can be used to ask queries.
- This chatbot is designed in such a way that the replies to the queries are both technical and jargon-free.
- It is a natural language processing (NLP) model that works using a large corpus of conversational data.
- It is capable of generating human-like replies, allowing natural conversation between the user and the virtual assistant.
- The chatbot makes use of Reinforcement Learning from Human Feedback (RLHF) technology. However, it is modified to appear more friendly to humans.
- It is based on GPT-3.5 – a deep-learning language model that produces human-like text.
- The technology produces different answers for the same question in the future since it improves over time and understands queries better through machine learning.



ChatGPT is occasionally found to generate incorrect answers to queries. This can potentially produce harmful instructions or biased content. The chatbot's knowledge is limited to events before 2021. It is also unable to provide answers to country-specific questions. It is only capable of providing generalized answers, unlike Google Assistant and Amazon Alexa that are more focused on giving specific answers to user queries.

OVERHAUSER MAGNETOMETER

- A magnetometer is a scientific instrument used for measuring the strength and direction of the magnetic field. It has various applications like geophysical surveys to look for iron deposits, exploration for shipwrecks, etc.
- Overhauser or OVH magnetometer is one of the most accurate magnetometers. It works based on the Overhauser effect. This instrument has several advantages like high accuracy, high sensitivity and power efficiency.
- Until recently, Indian scientists have been relying on imported OVH magnetometers. Now, the scientists at the Indian Institute of Geomagnetism (IIG) have developed India's first OVH magnetometer under its technology development program. The sensor is installed at the Alibag Magnetic Observatory.



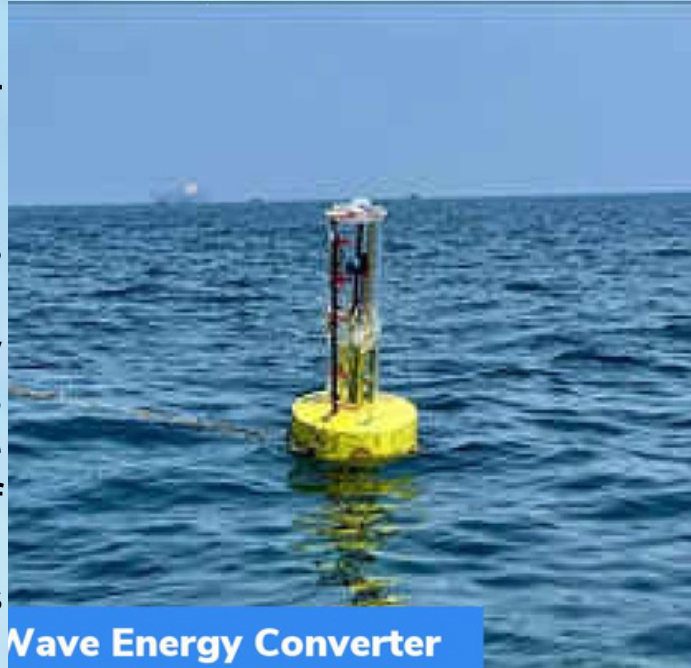
- Testing of the indigenous OVH magnetometer found it to be on par with its commercial counterparts. It is currently being tested for its long term stability.
- In future, when it is adapted and used in outer space environment, it will support the space research programs.



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OCEAN WAVE ENERGY CONVERTER

Researchers in IIT Madras have developed and deployed a system called Sindhuja-I that is capable of generating electricity using energy from sea waves. It was recently deployed some 6 km from the coast of Tuticorin in Tamil Nadu, where the sea's depth is around 20 meters.



Wave Energy Converter

- Sindhuja-I is an ocean wave energy converter that is currently capable of producing 100 watts of electricity using energy from seawaves.
- Its capacity is expected to be scaled up to 1 mW of energy in the next 3 years.
- This system has a floating buoy, a spar and an electrical module.
- The buoy moves up and down as the sea waves oscillate. A hole in the centre of the buoy will allow the spar to pass through it.
- The spar is fixed to the seafloor so that it is prevented from being moved by sea waves.
- This ensures that the buoy moves and the spar doesn't. This results in the production of a relative motion between spar and buoy.
- The power is produced by an electric generator using the relative motion between the spar and buoy.



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DRAGONFLY ROTORCRAFT

Dragonfly rotorcraft will be launched by the American space agency in 2027 to study Titan – the largest moon of Saturn.



NASA's Dragonfly rotorcraft

- Dragonfly rotorcraft is scheduled to be launched in 2027 and reach the Selk Crater region on Titan in the year 2034.
- The spacecraft, weighing less than 1,000 pounds, will look similar to a military transport helicopter.
- It will operate like a drone to understand the composition of Titan and conduct research to understand the origin of life on Earth.
- This would be the first aircraft on the Saturn's moon and the first-ever fully controlled atmospheric flight on any moon.
- It will be the first flying machine targeting a celestial body in the outer solar system.
- Titan is the target of NASA's Dragonfly rotorcraft since it is an ideal destination to research prebiological chemistry, astrobiology and the potential habitability of an extra-terrestrial world.
- Using all the radar images from Cassini spacecraft for over 13 years, scientists have successfully characterized Selk Crater region – the future destination of the Dragonfly rotorcraft.
- Researchers used angled shadows and radar reflectivity to accurately determine the surface's properties. They were able to map 6 terrains in the site, which helped them measure the rim height of the Selk Crater.
- This will enable the smooth landing of the NASA rotorcraft and help in its accurate exploration of Titan.
- Dragonfly is set to land on an equatorial, dry region of the Saturn's moon, which has frigid and thick atmosphere having hydrocarbon.
- While liquid methane rain frequently occurs in Titan, it is more like a desert seen on the Earth, with the presence of dunes, small mountains and an impact crater.

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