MAGAZINE

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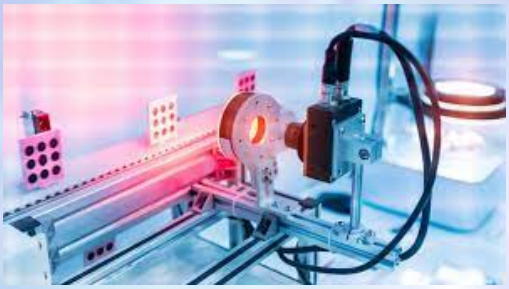
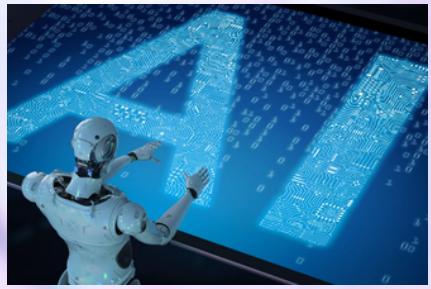
# Byte Quest

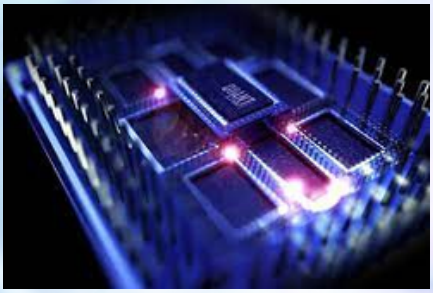
Department of CSE



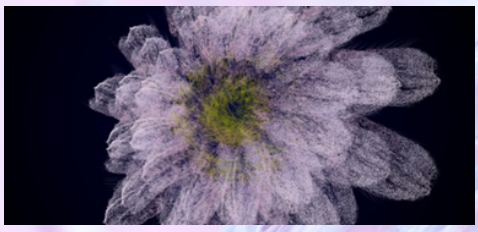
ARTIFICIAL VISION FOR LAND AND WATER




IS AI WORKING AS INTENDED?



NANOTECHNOLGY



MAKING ART THROUGH COMPUTATION

## *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.*

## *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.*

**FACULTY COORDINATORS**

S. KOMAL KAUR
(ASST. PROFESSOR)
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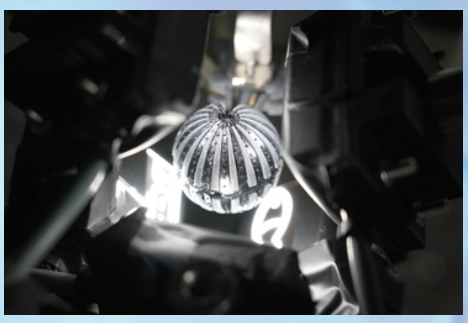
ANISHA (4/4) CSE B
AKASH (3/4) CSE C

# Byte Quest

## ARTIFICIAL VISION FOR LAND AND WATER



Inspired by a fiddler crab eye, scientists developed an amphibious artificial vision system with a panoramic visual field. Giving our hardware sight has empowered a host of applications in self-driving cars, object detection, and crop monitoring. But unlike animals, synthetic vision systems can't simply evolve under natural habitats. Dynamic visual systems that can navigate both land and water, therefore, have yet to power our machines, leading to researchers from MIT, the Gwangju Institute of Science and Technology, and Seoul National University to develop a novel artificial vision system that closely replicates the vision of the fiddler crab and is able to tackle both terrains. A logical extension of the work includes looking at biologically inspired light-adaptation schemes in the quest for higher resolution and superior image-processing techniques.

## HOW TO KNOW IF AI WORKS THE WAY INTENDED?

About a decade ago, deep-learning models started achieving superhuman results on all sorts of tasks, from beating world-champion board game players to outperforming doctors at diagnosing breast cancer.

These powerful deep-learning models are usually based on artificial neural networks, which were first proposed in the 1940s.

A local explanation method focuses on explaining how the model made one specific prediction, and global explanations seek to describe the overall behavior of an entire model. This is often done by developing a separate, simpler model that mimics the larger, black-box model. But because deep learning models work in fundamentally complex and nonlinear ways, developing an effective global explanation model is particularly challenging. This has led researchers to turn much of their recent focus onto local explanation methods instead.

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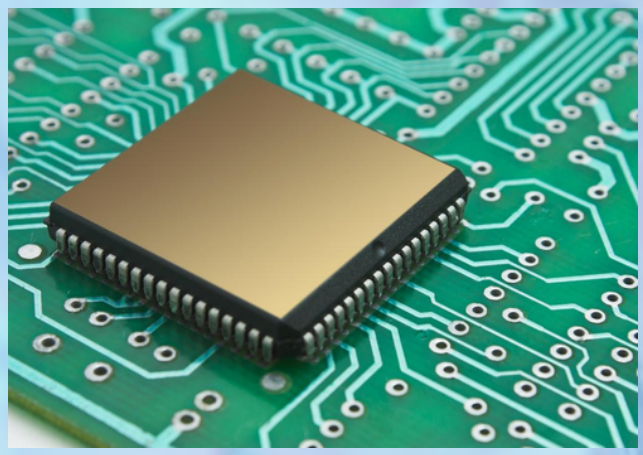
## NANOTECHNOLOGY

Nanotechnology, in the context of computer science, is a type of engineering geared toward building electronic components and devices measured in nanometers, which are extremely tiny in size and structure. Nanotechnology facilitates the building of functional matter and systems at the scalar level of an atom or molecule. It incorporates concepts from physics, biology, engineering and many other disciplines.



Nanotechnology is a scientific field that uses system or component development techniques to build products on highly granular levels. Nanotechnology works through different approaches to build nano materials or products, including bottom-up, top-down and functional system development. In a bottom-up approach, a product is designed as it evolves from its tiniest form factor to larger product. In a top-down approach, a large product may be reverse engineered to develop products scaled according to nanometer. A functional approach deals with a complete system and may incorporate bottom-up and top-down approaches.

Nanotechnology is implemented in many different fields and applications, such as computing, biotechnology, electronics and chemical engineering.

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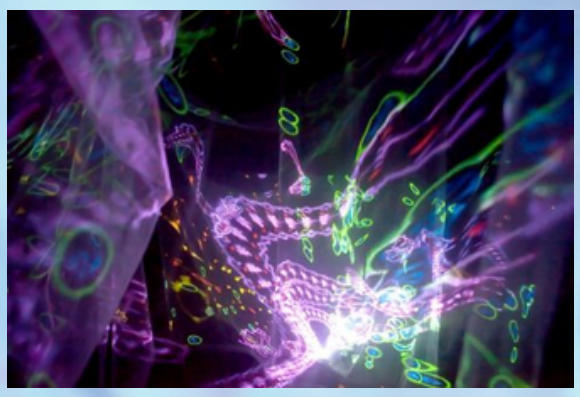
## ART THROUGH COMPUTATION

Master's student in MIT, Chelsi Cocking combines her love for computer science and design in her research and outreach efforts at the Media Lab.
Chelsi Cocking is an interdisciplinary artist who explores the human body with the help of computers. For her work, she develops sophisticated software to use as her artistic tools, including facial detection techniques, body tracking software, and machine learning algorithms.



In her final year of undergrad, Cocking took a studio class where she worked with two other students on a dance performance piece. Together, they tracked the movements of three local dancers and projected visualizations of these movements in real-time.
For this project, Cocking delved into a new medium: photography. In a series of images entitled Photorythms, she took photographic portraits of people and manipulated them using techniques from facial detection. Many of her images slice portraits using a particular shape, such as concentric rings or vertical stripes, and reassemble them in different configurations, reminiscent of cubism. Through Photorythms, Cocking also adopted a practice of "daily sketching" from her advisor, where she develops new code every day to generate a new piece of art.

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