

Module 3 - Physical AI

What is Physical AI?

Physical AI means using Artificial Intelligence in real machines or devices that can sense, move, act, and make decisions in the real world.

It combines:

- AI (which helps machines think and learn)
- Physical machines (like robots, drones, smart cars)

These machines are not just software – they move, sense, and perform tasks just like humans do!

In short: Physical AI = AI + Physical machines + Real-world tasks

Technologies that Power Physical AI

1. Sensors

Sensors are like eyes, ears, and skin for machines. They collect data from the environment.

- Examples: Temperature sensor, motion sensor, sound sensor, camera sensor
- Use: A robot can detect if something is hot or if a person is nearby.

2. AI and Machine Learning

AI allows machines to learn from past experiences and make decisions.

- Example: A vacuum cleaner learns which areas are more dirty and cleans those first.

3. Robotics

Robotics is the field of building physical machines that can perform tasks.

- Example: A robot arm in a factory that lifts and places heavy parts.

4. Edge Computing

Edge computing means AI works directly on the device, without depending on the internet or cloud.

- Example: A security camera detecting motion and alerting the owner without needing internet access.



CBSE



ICSE



NTSE



Banking &
Insurance



Central Govt.
Service



State Govt.
Services



LAW
Entrance



MBA
Entrance



Railways & Metro
Services

...many more

abhyasonline.in



Course
&
Test Series

Introduction to Artificial Intelligence

Applications of Physical AI

Let's explore how Physical AI is used in different fields with examples:

 1. Education

- Robots and AI tools help students learn by interacting with them in fun ways.
- Useful for children with special needs, language learning, and personal tutoring.

Examples:

- A robot that speaks and helps students solve math problems.
- AI assistants that monitor classroom behavior and help teachers.

 2. Healthcare

- Physical AI is used in hospitals for patient care, surgery support, and monitoring health conditions.

Examples:

- Robots that assist doctors in surgery with precision.
- AI-powered wheelchairs that move with voice or eye commands.
- Machines that deliver medicines to patients.

 3. Automation and Industry

- In factories, robots controlled by AI do repetitive or dangerous jobs like assembling, packaging, or inspecting products.

Examples:

- Robot arms assembling car parts.
- AI checking the quality of packed food boxes.

 4. Agriculture

- Farmers use AI machines to monitor crop health, water usage, and even plant seeds.

Examples:

- Drones that fly over fields to check plant growth and detect diseases.
- Machines that water plants only when the soil is dry, using moisture sensors.

 5. Transportation

- Self-driving cars and smart delivery systems are powered by Physical AI.
- They can see roads, recognize people, and drive safely without human help.

Examples:

- A self-driving taxi that follows traffic rules and avoids accidents.

CBSE

ICSE

NTSE

Banking & Insurance

Central Govt. Service

State Govt. Services

LAW Entrance

MBA Entrance

Railways & Metro Services

...many more

abhyasonline.in

**Course
&
Test Series**

Introduction to Artificial Intelligence

Sensors in Physical AI

Temperature Sensor

• A temperature sensor is a small device that measures how hot or cold the air or an object is. It is used in many places like homes, refrigerators, and weather stations to keep things at the right temperature.



• For example, in a smart home, the temperature sensor checks the room's temperature and sends this information to a heater, air conditioner, or fan.

Motion Sensor

• A motion sensor is a device that can detect movement in a room or area. It works like the eyes of a smart system, noticing when someone walks in or moves around.

• Motion sensors are often used to turn lights on automatically when a person enters a room and turn them off when the room is empty. This helps save electricity and makes life easier because you don't have to switch lights manually.

Light Sensor

• A light sensor is a small device that measures how much light is in a room or outside. It helps smart systems know if it is bright or dark.

• For example, when the sunlight is strong during the day, the light sensor can tell the system to turn off the indoor lights to save electricity. At night or when it's dark, the sensor can help turn lights on automatically so the room stays bright.

Sound Sensor

• A sound sensor is a device that can hear sounds or noises around it. It works like ears for smart systems and can detect how loud or quiet the environment is.

• In a smart room, a sound sensor can be used to turn on a device when it hears a clap or a voice, or to lower the volume if the room gets too noisy.

• It can also help security systems by detecting unusual sounds like breaking glass or loud noises.

Machine learning

Machine Learning is a branch of Artificial Intelligence where computers learn from data to make decisions or predictions without being explicitly programmed with rules for every scenario.

CBSE

ICSE

NTSE

Banking & Insurance

Central Govt. Service

State Govt. Services

LAW Entrance

MBA Entrance

Railways & Metro Services

...many more

abhyasonline.in