

ICT IGCSE Theory – Revision Presentation

1.5 Impact of emerging technologies

- Describe how emerging technologies are having an impact on everyday life (e.g. artificial intelligence, biometrics, vision enhancement, robotics, quantum cryptography, computer-assisted translation, 3D and holographic imaging, virtual reality)

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Emerging Technologies

Artificial intelligence (AI) is computer systems that can simulate human intelligence (able to make decisions typically made by a human).



- **The PR2 robot** is being programmed to complete a number of specific tasks just like a human.
- **Deep Blue** was a chess-playing computer developed by IBM. It is known for being the **first piece of artificial intelligence** to win both a chess game against a reigning world champion.
- **Self-parking** cars currently on the market are not completely independent, but they do make parallel parking much easier.

- As seen in the movies **AI** could be potentially used in the military and police force.
- However the issue would be whether a robot could demonstrate **empathy** in certain situations.

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Biometrics authentication is used as a form of **identification** which recognises individuals body parts. Biometrics uses **unique characteristics** of the human which means it can not be **replicated** by other people.



Finger Printing

- Staff can scan their finger prints to sign in and out of work.
- Police can use finger print to authenticate an individual's identity.
- Some laptops use finger prints biometrics to gain access to the system.



Eye Recognition

- The iris of the eye is scanned for recognition purposes.
- No physical contact is required to scan the iris which may be useful in some cultures.
- Immigration at airports use eye recognition to prevent people travelling with fraudulent documentation.

Facial and **voice recognition** is also another form of biometrics. The main purpose of biometrics is to **improve security** with regards to access to computer systems.

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Vision Enhancement uses video technology which is projected to the user through the lens. The system can bring distant objects closer and into focus.

- The vision enhancement system amplifies infrared light so that an image can be clearly seen even in darkness.
- Militaries across the world use this technology to complete missions and carry out surveillance at night.



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Robotics are used commonly in the manufacturing industry typically completing labour intensive jobs.

- Robots can be programmed to complete specific tasks or used manually.
- No human intervention is required once the robot has been programmed.
- Robots can complete tasks with more precision including robotic surgery.
- Robots can work in extreme conditions or environments.

How Are Robots Used in a Factory?

1. **Lift heavy items** into from place to place
2. **Assemble** parts together to create things
3. **Join** parts together using **glue**, or by **welding** (melting metal)
4. **Paint** items



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Quantum Cryptography

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Computer-assisted Translation

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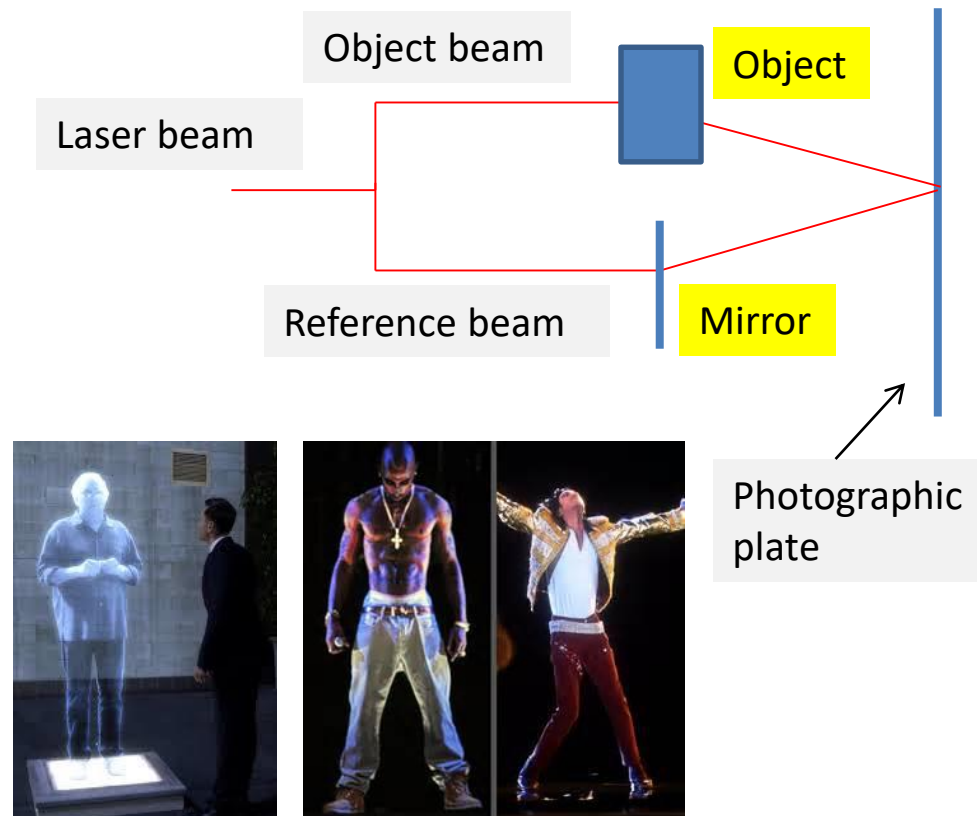
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3D and **holographic imaging** is a technology that allows 3D images to be produced. A holographic image moves in the same way as the original image in three dimensions (**3D**)

How Holograms are created:

1. **Splitting** a laser beam.
2. Half the light (**object beam**) is reflected of the **object** onto a photographic plate .
3. The other half of the light (**reference beam**) is reflected off a **mirror** onto the same photographic plate .
4. The hologram is produced when the **two light beams meet on the photographic plate**.



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Virtual reality is an artificial environment that is created with software. The user will normally wear a head mounted display which will simulate their physical presence in places in the real world or imagined worlds.

Uses:

- 1. Training:** Allow professionals to conduct training in a virtual environment without the threat of any physical harm.
- 2. Education:** Looking inside of an ancient building or ruins
- 3. Computer Games:** users are able to immerse themselves into a gaming platform.
- 4. Sports:** It is used as an aid to measuring athletic performance as well as analysing technique
- 5. Construction:** An organisation can not only render the resulting structure in 3D but also experience them as they would in the real world.

