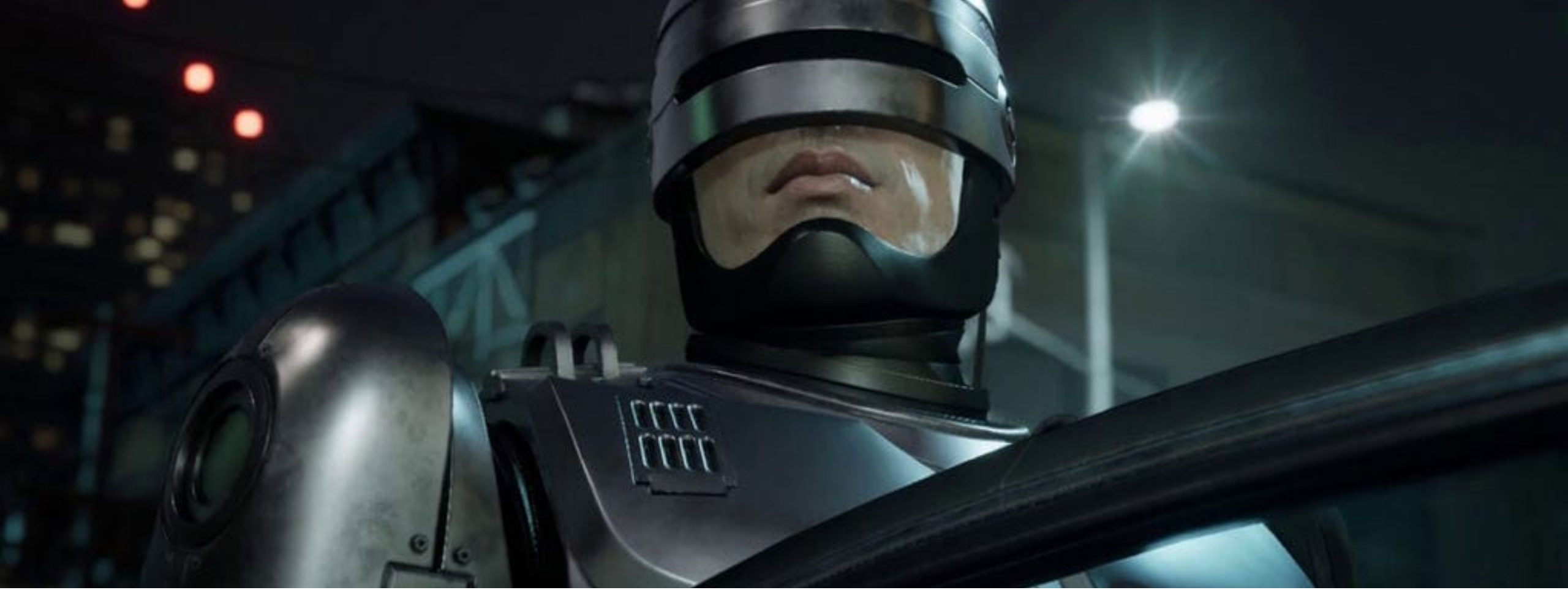

IMPACT UPON DIFFERENT SECTORS

Lecturer: Mark Gillan

AI IMPACT ON DIFFERENT SECTORS

- Focus on real-world, contemporary uses of AI
  - Emphasis upon impact:
  - Efficiency
  - Accuracy
  - Cost
  - Employment
  - Service Quality
- Classroom discussion and evidence gathering by students

SECTORS

- A *sector* is a broad area of economic or social activity.

- AI is now used across both public and private sectors.

Adoption is driven by:

- Availability of large data sets
- Increased computing power
- Cheaper cloud-based AI services

- Key discussion point: AI is not one technology, but a collection of tools applied differently in each sector.

HEALTHCARE AND MEDICINE

Impact:

- Faster diagnosis
- Reduced human error
- More efficient use of staff time

AI supports diagnosis, treatment, and administration.

Medical imaging AI can detect cancers earlier than human clinicians in some cases.

AI systems analyse X-rays, MRIs, and CT scans to identify abnormalities.

Predictive models help hospitals manage patient flow and bed availability.

In Scotland and the wider NHS, AI is being trialled to reduce waiting times.

FINANCE AND BANKING

Impact:

- Billions saved globally through reduced fraud
- Faster loan decisions
- Fewer routine jobs, but growth in data-focused roles

AI is widely used in fraud detection.

Systems analyse millions of transactions in real time.

Machine learning models identify unusual spending patterns.

AI-driven credit scoring assesses loan risk using non-traditional data.

Chatbots handle customer enquiries 24/7.

RETAIL AND E-COMMERCE

Impact:

- Increased sales and customer satisfaction
- Reduced overstock and shortages
- Ethical discussion: consumer manipulation and data privacy

Recommendation systems suggest products based on browsing and purchase history.

Dynamic pricing uses AI to adjust prices in real time.

Stock management systems predict demand and reduce waste.

Visual search allows customers to search using images instead of text.

TRANSPORT AND LOGISTICS

Impact:

- Reduced fuel use and emissions
- Faster delivery times
- Ongoing debate about safety and driver job displacement

AI is central to route optimisation for delivery companies.

Navigation apps use AI to predict traffic congestion.

Autonomous vehicle technology relies on computer vision and sensors.

AI schedules maintenance by predicting vehicle faults before failure.

EDUCATION AND TRAINING

Impact:

- More personalised learning experiences
- Reduced teacher workload for repetitive tasks
- Concerns around over-reliance and academic integrity

AI-powered learning platforms adapt content to individual learners.

Automated marking tools provide instant feedback.

AI tutors support revision and personalised study plans.

Predictive analytics identify learners at risk of disengagement.

MANUFACTURING AND INDUSTRY

Impact:

- Increased productivity
- Improved workplace safety
- Shift from manual roles to technical and supervisory roles

AI-driven robots perform repetitive and dangerous tasks.

Computer vision systems inspect products for defects.

Predictive maintenance reduces machine downtime.

AI improves supply chain efficiency.

POLICING AND PUBLIC SERVICES

Impact:

- Faster service delivery
- Risk of bias if systems are trained on flawed data
- Strong ethical and legal considerations under Scots law and human rights

AI supports crime pattern analysis and resource allocation.

Facial recognition technology used in limited and controversial contexts.

AI assists in processing large volumes of public sector data.

Chatbots handle routine council and government enquiries.

MEDIA, ENTERTAINMENT, AND CREATIVE INDUSTRIES

Impact:

- Lower production costs
- New creative opportunities
- Concerns over originality, copyright, and job security

Recommendation algorithms shape what users watch and listen to.

AI generates music, images, and video content.

Game development uses AI for non-player character behaviour.

News organisations use AI to summarise data-heavy stories.

AGRICULTURE AND ENVIRONMENTAL MANAGEMENT

Impact:

- Reduced environmental impact
- Increased food security
- Improved decision-making for farmers

AI analyses satellite images to monitor crops.

Precision farming uses AI to optimise water and fertiliser use.

Predictive models forecast crop yields and disease outbreaks.

Environmental AI tracks deforestation and climate patterns.

SUMMARY AND DISCUSSION

- AI has transformed nearly every major sector.
- Impacts include efficiency, cost reduction, and improved decision-making.
- Risks include bias, job displacement, and ethical concerns.
- Key question for learners:
  - Should all sectors adopt AI, or are there areas where human decision-making should always remain central?