Augmented Manufacturing Reality

Digital Technologies for Manufacturing Innovation:
Embracing Industry 4.0

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Aims and Objectives

- Develop an **augmented reality system** to support the creation of augmented user views in a **manufacturing**, **facilities management** and **rail industry** environment
  - Overlay **digital data** (e.g. CAD, simulations, video, etc.) with information about the **physical environment** (e.g. size, temperature, power usage etc.)

- Improve **efficiency**, enable **optimisation**, and enhance **decision making** through providing greater access to information between top and shop floor through **desktop and mobile application.**

- Objectives:
  - Augmented facilities design and plant layout information.
  - Augmented machine maintenance related information.
  - Web based and mobile application platform.
  - Data accessible on shop floor from office or remotely.

Project Impact

The developed system will have impact on the following use cases:

- **Maintenance and Energy Management:** Based on the results of monitoring a machine, different maintenance and repair actions can be undertaken.

- **Facilities Design:** This will allow the user to assess how new designs of equipment, lines, etc. will fit into the existing facilities.

- **Manufacturing Processes:** Optimise production rates, throughput, cycle times, etc. of a process in a factory can be monitored.

- **Manufacturing Operations:** The system will help direct operators, in particular new trainees, to learn how to operate the machinery.

Augmented Views

Future Opportunities and Challenges

- **Applications and Opportunities**
  - Military: The project outcome can be used to display the real battlefield scene and augment it with annotation information.
  - Entertainment and Games: The technology can be applied in entertainment and gaming industries.
  - Education: New possibilities for teaching and learning can be provided by AR.
  - Urban Planning: AR can be used as a decision support in architecture and interior design.

- **Challenges:**
  - Deal with vast amount of information in reality.
  - Small, light, and easily portable hardware and fast enough to display graphics.

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