

Additive Manufacturing Technology Group

Delivering effective solutions in product realisation and advanced manufacturing

Additive Manufacturing (also known as 3D Printing) has been hailed as a 'new industrial revolution'.

Additive manufacturing (AM) expertise enables objects of almost unlimited complexity to be manufactured directly from Computer Aided Design (CAD) data without tooling. The process works by the precise addition of material in layers to form the object and is often referred to as rapid prototyping or layer manufacturing. Increasingly this technology is being adopted for the manufacture of production parts in low volumes. Machines are now commercially available that can process plastics, metals and ceramics, and new developments in the field will increase the speed and quality of parts produced.

Mission

To develop the next generation of AM processes which will enable low volume and even individually customised parts of the required quality to be produced in an economically and environmentally sustainable way. The results of this work will be exploited through strong industry links and disseminated via undergraduate and postgraduate teaching.

Background

The AMTG was established in the 1990s and has been led since 2001 by Professor David Wimpenny who joined De Montfort University after 15 year heading the Rapid Prototyping & Tooling research activities at Warwick University.

Expertise

Digital manufacturing of end-use parts is the key focus of the research conducted by the AMTG:

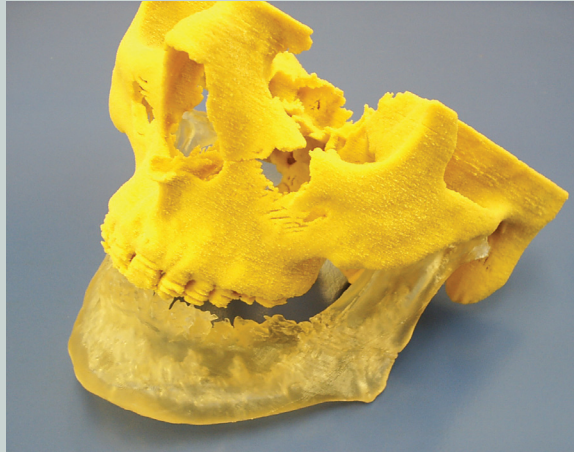
- Application of AM and associated techniques (Rapid Tooling, Reverse Engineering, High Speed Machining etc.) to reduce product development lead-times and cost
- Development of new AM processes through to proof of concept
- Rapid manufacturing of high volume components using a combination of layer manufacturing and high speed printing technology
- Application of AM techniques in the field of surgery including protocols for generating higher accuracy CT scan data

Facilities

The group has one of the best AM facilities in the UK equipped with a wide range of commercial machinery including:

- **Stereolithography:** produces high quality transparent resin models that can be used for fit & function for evaluation of new products
- **Fused Deposition Modelling:** provides a flexible method for producing low cost functional plastic parts from ABS plastic.
- **Zcorp 3D Printing:** enabling the rapid production of low cost concept models
- **Laser sintering/melting:** enabling functional prototypes and production parts to be made from a wide range of metals and plastics





In addition the AMTG also has research machines:

- **Selective Laser Printing (SLP400):** deposits a wide range of plastic materials very quickly to enable low volume production application to be supported
- **Nscript 3DN300 bioplotter:** deposits fine lines of conductive and non conductive materials, opening up the potential to generate electromechanical devices particularly in the medical sector

Additive Manufacturing Technology Group can offer:

- Economic production of one-off parts
- The ability to combine several materials in a single part
- Applications of prototypes for testing low volume production
- Medical planning models, customised implants and jigs
- Unlimited part complexity, no tooling required
- Parts formed by the precise addition of material in layers

Key Collaborations

Universities

- Leicester
- Loughborough
- Warwick
- Sheffield
- Czech Technical (Prague)
- Tsinghua (Beijing)
- Patras (Greece)

Hospitals

- Coventry & Warwickshire NHS Trust
- Leicester Royal Infirmary
- Sheffield Teaching NHS Trust
- University Maastricht (Holland)

Industrial

- | | |
|----------------------|------------------|
| – Ford Motor Company | – Renishaw |
| – JCB | – Delcam |
| – Black & Decker | – Materialise |
| – Dyson | – Cummins |
| – Alstom | – Electrox |
| – Rolls Royce | – Agie-Chamilles |
| – Panasonic | – QinetiQ |

Research Grants and Projects

- Transport iNet: Components for Energy Efficiency in Transport by AM (CEEAM)
- Knowledge Transfer Partnership with KTP Suspensions Ltd
- With support from Technology Strategy Board Technology Programme:
 - Selective Laser Printing of High Performance Polymers (SPRINT)
 - Remanufacture of high value products using a combined Laser cladding, Inspection and Machining system (RECLAIM)
 - Laser Printed Electronics (LPE)
 - Direct Writing of Bioceramics by Freezercasting

Contact details

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