

Biomimetics at Reading

What is Biomimetics?

Biomimetics is defined as the ‘abstraction of good design from nature’. Its central ethos is that novel solutions have arisen in the natural world and these can be used as the basis for new technologies. Because nature tends to be very economical with energy, bioinspired technologies have the potential to provide cleaner, greener solutions.

About the Centre

The Centre for Biomimetics at Reading was founded in 1992. It was the first Centre in the UK to bring together engineers and biologists, under one roof, to develop new biologically-inspired technologies.

Researchers in the Centre enjoy excellent collaborative links with both other universities and industry worldwide. The Centre is also home to the global Biomimetics Network for Industrial Sustainability (BIONIS), giving us unrivalled access to information on cutting-edge developments in the field.

Customers for our research include blue-chip companies, SMEs, government departments, research councils and charities. leading to patents and a large number of scientific publications. Our staff are frequently invited to speak about biomimetics as a design methodology at academic conferences, industry meetings and public events.

Expertise

We can provide research, consultancy and training services to help you apply biomimetics to your products. Some of our principal areas of current research are detailed below.

Sensors

Insects possess a variety of robust, yet sensitive sensory systems. Work has examined the ways in which mechanical strain and airflow sensors found in nature can be used as the basis for new sensing technologies.

Composite materials

We have considerable expertise in understanding natural composite materials, for example, the ways in which fibre orientation and packing can explain mechanical performance. Applications of this work have included the development of plant fibre composites, high-performance glass fibre composites and optimisation of fibre orientation for added functionality.

Actuation

Nature possesses many ways of generating movement. By using polymer gels, we have produced novel actuation systems that mimic the ways in which plants generate shape change and movement in their leaves.

Textiles

Work has concentrated on the development of adaptive textiles and continues with studies that aim to develop polymer insulators with properties more akin to down feathers.

Friction, adhesion and wear

Using techniques developed in-house, we have explored how frictional coefficients and wear behaviour of biological materials are optimised. Further industry-funded work has explored how cereal starches can be used as a renewable alternative to talc across a range of application areas.

Packaging

Working with industry, we have conducted basic research to identify methods of manufacturing impact-absorbing packaging materials from renewable feedstocks. Further work has explored the use of vegetable waste as the basis of new biodegradable packaging materials.

Biomechanics

We have an established track record of basic research into the mechanics of biological materials, from nanoscale up to bulk material properties. Our work has been applied to problems in veterinary and human medicine.

Services

We offer the following services to industry:

- Contract research. Basic and applied research to aid new product development.
- Consultancy. Scoping studies to identify the potential of biomimetics to add functionality to existing product portfolios.
- Continuing Professional Development (CPD) seminars and courses.

For further details of our full range of activities, please contact Dr Richard Bonser, Tel. 0118 378 5219, E-mail r.h.c.bonser@reading.ac.uk