

## **Biomimetics: Challenges, Development and Opportunities**

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Biomimetics deals with knowledge transfer of deep principles from animated nature to technology and the arts. Nature excels at combining materials, structures and processes. A classic example for successful biomimetics is the aerodynamic shape of airplanes inspired by birds. Current biomimetic developments range from nanostructured surfaces (self cleaning, antireflective) to whole buildings (Beijing National Stadium).

The scarcity of available resources is one of the major challenges for humankind. Energy, raw materials, food and water are increasingly short in supply. Compared to conventional engineering products, biomimetic applications usually offer an improved effort-performance relationship. This makes the biomimetic approach an ideal tool to tackle major global challenges as defined by the United Nations Millennium Project.

This lecture will deal with biomimetic engineering approaches in dealing with these major challenges, and outline opportunities that arise from this methodology. Based on detailed examples, solutions will be presented and the underlying principles explained. Another goal of this presentation will be to illustrate where biomimetics is currently heading and which issues can come up in connection with consequent application of biomimetics.