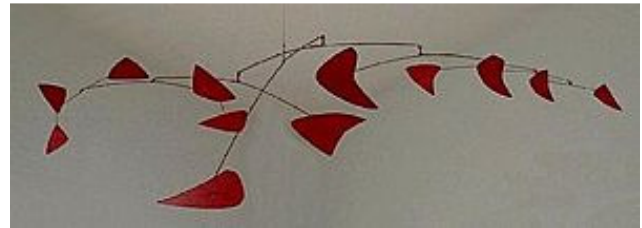


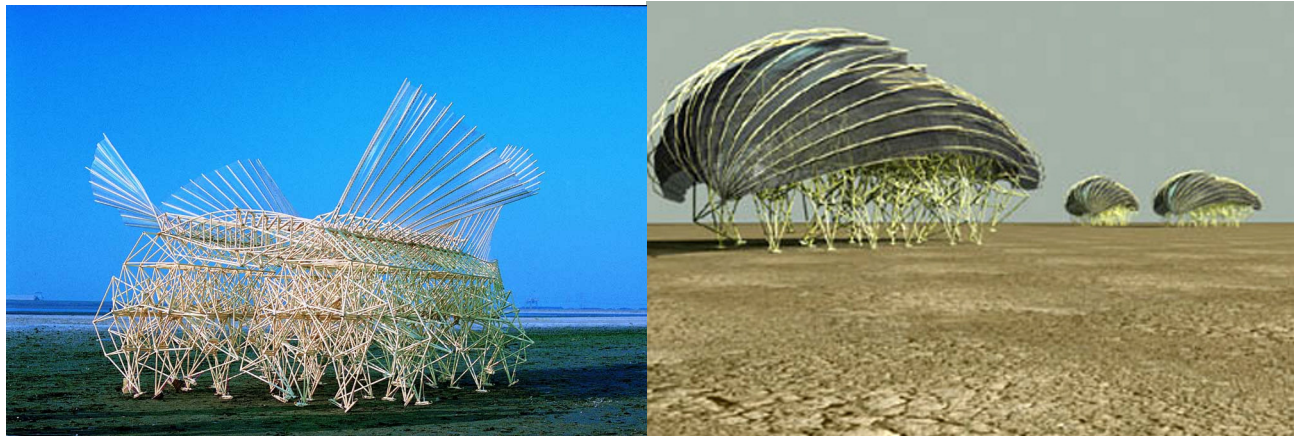
Kinetic art is art that contains moving parts or depends on motion for its effect. The moving parts are generally powered by wind, a motor or the observer. The term kinetic sculpture refers to a class of art first recorded by the sculptors Naum Gabo and Antoine Pevsner in their Realist Manifesto issued as part of a manifesto of constructivism in 1920 in Moscow. "Bicycle Wheel," of 1913, by Marcel Duchamp (Born in 1887, in Blainville-Crevon, France), is said to be the first kinetic sculpture. Further popularized in the 1930s through the mobiles of Alexander Calder (born in 1898, in Lawnton, Pennsylvania), the method came to full prominence in the 1950s.



Bicycle Wheel is said to be the first kinetic sculpture. (The original from 1913 was lost, and Duchamp recreated the sculpture in 1951.)

Red Mobile, 1956. Painted sheet metal and metal rods, Montreal Museum of Fine Arts.

Theo Jansen (born in 1948, in The Hague, Netherlands) is a Dutch artist and kinetic sculptor. He builds large works which resemble skeletons of animals and are able to walk using the wind on the beaches of the Netherlands. His animated works are a fusion of art and engineering. His saying is "**The walls between art and engineering exist only in our minds.**"



Kinetic sculptures by Mr. Theo Jansen.

Many of kinetic sculptors have science/engineering training. For example, Gabo entered Munich University in 1910, studying first medicine, then the natural sciences. He transferred in 1912 to an engineering school in Munich. Alexander Calder graduate from Stevens Institute of Technology, majored in Mechanical Engineering. Theo Jansen studied Physics at University of Delft before he became an artist. It is evident that behind every kinetic sculpture, there are mechanical components, which are governed by mechanical principles. For example, each leg, in Mr. Jansen's beach beast, is a linkage (a mechanism). The Red Mobile is in a stable dynamic balancing position. The question is: if these science/engineering trained artists can create their kinetic sculptures

with their artistic instinct, can we (mechanical) engineers create kinetic sculptures using rigorous design theories and tools?

As our first effort, Mr. Daniel Giesbrecht designed the leg of Mr. Jansen's beach beast using the theory of mechanism design as his undergraduate thesis project. The leg consists of a 4-bar function generator, a parallelogram mechanism and a motion generator. A two-slide presentation of Dan's design is shown here, and the animation of the motion of the leg is shown here. Dan continued his graduate studies and further refined his design based on the mechanism design theory and Genetic Algorithms. He also built a prototype of a smaller beast. The movies are shown here.