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A CONCEPTUAL FRAMEWORK BASED ON THE JOINTS OF A ROBOT TO CREATE A PROTOTYPE ARTICULATED USING THE PARAMETRIC MODELING.

The term robot comes from the Czech word "robota" meaning "forced labor." This term was first used by the Czech novelist and playwright Karel Capek in the play called RUR (Rossum's Universal Robots) in 1921.

There are many types of robots among which are the humanoid robot. A humanoid robot mimics human appearance and some aspects of their behavior, but from the point of view of the designer, these robots are seen as a puppet animated by using mechanisms that simulates the behavior of living things through bionics.

Fig 1. Humanoid robot, (view in http://blog.espol.edu.ec/edfe/2011/01/15/sal-de-las-dudas-definiciones-de-ciborg-humanoide-y-androide/).

Bionics is the branch of cybernetics, which tries to simulate the behavior of living organisms by mechanical means, such as the joints.

Mechanically, a robot is comprised of a series of elements or links connected by joints which allow relative movement between each two consecutive links. The motion of each joint may be by displacement, rotation or a combination of both.

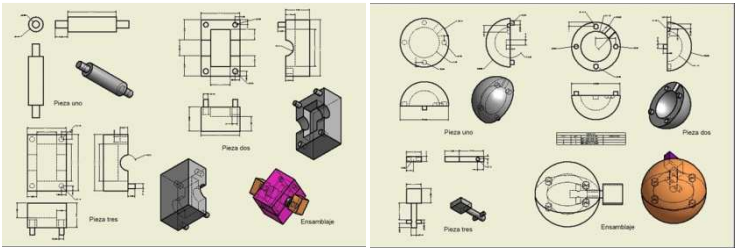

Fig 2. Motion of joint, (a) Three prisms, (b) Sphere.

This project start from the premise of using parametric modeling to identify, develop, describe and generate the morphological and functional behavior of a puppet, using the following methodology:

- Development of the parametric modeling of the joint movements
- Generation of parametric design
- Build the prototype.

The aim of this paper is to present an empirical evidence of the mechanism of an articulated prototype, taking into account the principles of bionics through parametric modeling to explore and analyze the changes generated by the points, lines and planes in space.

Fig 3.Articulated prototype created by students: Mario López Vázquez at the Autonomous Metropolitan University, Cuajimalpa, Mexico.