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**TRANSFORMABLE DESIGN:
AN APPROACH BETWEEN MATHEMATICS AND ARTS**
Márcia Anaf, Ana Lúcia N. C. Harris

ABSTRACT

The kinetic architecture and named by Hoberman 'Transformable Design' point an inquiry way of investigation for projective concerns present in the current Design, architecture and related fields. The present complexity in Hoberman's works expresses the contemporaneity of his projects, in which, concepts such as adaptation, transformation, mobility and interaction gain form, based on principles of spherical trigonometry and pantographic geometry. The study of Plato's Polyhedron and Archimedes is the starting point for the construction of models and structures that change its size and its configuration, keeping its area and at the same time altering its volume. The modular units, systems, subsystems and connections present in pantographic polyhedrons facilitate and complement development of retractable structures, which expand and contract, a Kinetic Architecture.

The construction of retractable polyhedrons based on geometry pantographic presents new challenges for the research of Drawing and geometry of the 21st century, once noted the increasing accessibility to new tools, mainly in the area of digital fabrication [3]. This article describes an experiment conducted in the shape of a workshop whose focus was to approach the Kinetic Architecture, based on the pantographic structures, inspired by studies of Hoberman's work. This experiment took place in November 2013, within an International Conference, whose participants were teachers in the area of drawing and geometry. The Workshop was attended by university professors from public schools, from Brazil, whose common interest is in research related to the education area of graphic expression. From an explanation about the experiments and researches on this subject, were offered participants a kit of parts and Assembly challenges so that they could understand, through experimentation, the potential of these structures. Thus, the authors were able to share their "Geometric explorations of the form for the development of architectural structures articulated from the workmanship of Chuck Hoberman", conducting wire of the research of the doctoral research of ANAF [1], whose objective is the use of structures based on kinetic architecture for the development of adaptive environments and potentially suited to local needs. The workshop results showed the applicability and potential of this type of approach focusing on the transmission of concepts of kinetic architecture.

Márcia W. ANAF, (marciaanaf@uol.com.br)
Ana Lúcia N. C. HARRIS (luharris@fec.unicamp.br)
UNICAMP, Depto de Arquitetura e Construção, Faculdade de Engenharia Civil, Arquitetura e Urbanismo.