Origami Transformer: Bridging Ancient Art with Modern Computer Sciences

Yeoh, Chin

Art and science are often thought to be polar opposite. This project, Origami Transformer, bridges ancient art with computer science by creating a self-folding origami with the aid of a computer coding. Many existing self-folding origami are made by heat and electrical force apply on advanced materials such as heat shrinking polymer or shape memory composites, but these materials are not readily available for many people. This project creates a self-folding origami by applying a single-directional, mechanical force onto a continuous route of string that is sewed on to the flat material. It creatively uses computer code to calculate where to assign a continuous string to enable a flat material to transform into a three dimensional object. The algorithm of the Origami Transformer software can be divided into three main steps. First, the program solves the inputted crease pattern and simulates a folding process in a virtual three-dimensional space. Second, the program calculates a workable route of string, so that with a single-directional force applied onto the string, the flat material can self-fold. Third, the user can virtually design the origami model by integrating additional features. The output of this program is a blueprint image that provides guideline for creating a desired Origami Transformer. Due to the flexiblility of adapting to a variety of shapes, Origami Transformer has a wide range of applications (decoration, education, robotic etc.). Some benefits are the ability to stored flatly, 2D fabrication of 3D objects and quick deployment with single pull.

Awards Won:

Fourth Award of $500