Spring & Sunflower: Two Flexible Grasping Machine Made of Rigid Material Based on Origami Structure

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In this engineering project, two flexible grasping machines (Spring and Sunflower) made of rigid materials are developed based on two different origami structures. They provide flexibility and protectiveness that traditional designs of rigid grasping machines are lack of. And they overcome the weaknesses of soft grasping machines such as lack of durability, limited choice of materials, and comparatively high cost in development. Spring is a traditional three-finger grasping machine. The origami structure of paper spring is applied in the fingers of the grasping machine to enable rigid materials to bend and composed. Sunflower is a pneumatic grasping machine. The endoskeleton inside the air chamber is made of PVC material with origami structures applied on solar panel on aircraft. The maximum weight that Spring can grab is 707.1g, and that Sunflower can grab is 1731g. Both grasping machines succeed in grabbing most of the daily objects protectively, which proves the adaptability of both grasping machine on grabbing different objects. And both of the origami structures have a good durability. Because the origami structure is simple and there is few material restriction, the consumer can also choose materials as their needs and wants. These two designs of flexible origami grasping machines can be used for automatic sorting or can be used as assistance hand in daily life with future development.

Awards Won:
Fourth Award of $500