rBAT

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rBAT is an ongoing research project that inspired by the flying behavior of bats in the nature, while coupling the advances of aerodynamics and the control of man-made flying machine and robots. It challenges the capacity of using informal techniques to create robust flapping motion which generates a certain amount of thrust. rBAT is consisted of four major components- a central double-layer laminated mechanism that creates the flapping behavior; a tail which balances the body weight while generating downwards thrust; a motor and gear system with a four bar linkage, transferring the continuous rotary motion of the motor into directional input on the central mechanism within certain range, which drives the flapping mechanism and the tail; a pair of wings with a rigid skeleton and thin polyester films, containing two sets of passive linkages for compliance during a full stroke of flapping. rBAT is being developed with testing equipment and currently moves forwards and backwards on a pair of horizontal rails. Its directionality of movement is controlled by the motor speed.

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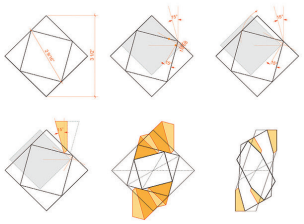
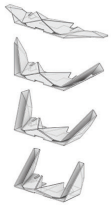
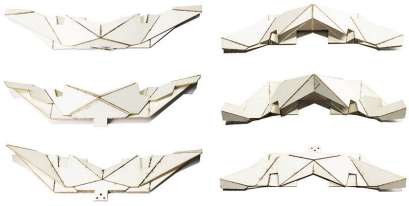
_Pop-up Mechanism
spherical linkage dimension

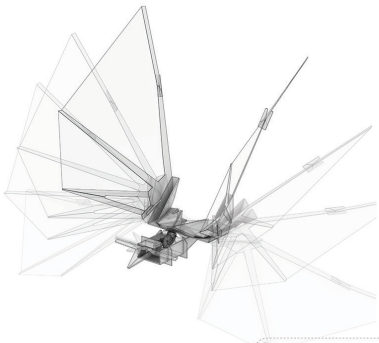


_Central Mechanism
kinematic

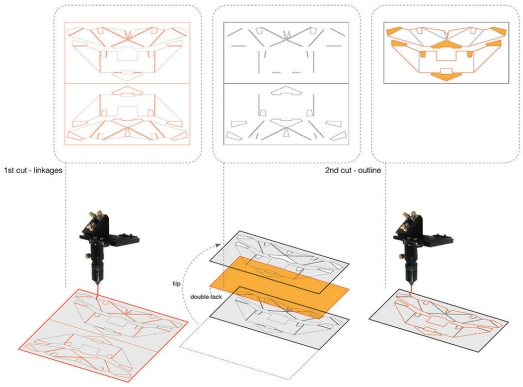


configurations





_Fabrication
Double-layer Lamination



_Assembly