Jonathan Aaron Franco et al., J Fundam Renewable Energy Appl 2018, Volume: 8
DOI: 10.4172/2090-4541-C1-050

AIPG - aeroelasticy induced power generation

Jonathan Aaron Franco, Benjamin Cheng, Matthew Tibse, Ian Pollard, Jake Adler, Steven Dobbs and **Zhen Yu**
California State Polytechnic University, USA

Aeroelasticy Induced Power Generation: This is a multi-disciplinary undergraduate research project consisting of one Aerosapce Engineering team and three Electrical Engineering teams. The ultimate goal for this multi-year project is to fly a 3-D printed UAV electric propulsion aircraft that generates power from multiple environtemental sources to facilitate a new world record for the longest flight time. Regenerative braking is currently being used in the automotive industry to charge hybrid vehicle batteries; the goal of this project is to research and develop new regenerative power mechanisms for the Aerospace industry. The system is designed to generate electrical power from multiple sources; oscillatory vibrations of a flexible wing due to aeroelastic flutter and gust response exciting motor generators, piezoelectric devices, with additional solar power generation. Light weight power storage devices are being developed including 3-D printed batteries and graphine super-capacitors. The motor generation mechanisms are stored in a pod attached to the bottom of the wing and the piezos are attached to the wing spar. A long term goal of the project is to enable simultaneous 3-D printing of the power generation and storage devices within a 3-D printed composite structural wing. The manufacturing of the composite 3D printed wing and power storage devices are currently under development. These generation and storage mechanisms are interfaced with a power management circuit capable of collecting electrical power inputs from multiple power sources, charging the batteries to drive the electric motor propeller.

Biography

Jonathan Aaron Franco is currently a senior Aerospace Engineering student at California State Polytechnic University, Pomona. He is the Project Manager of this multi-disciplinary senior project including three Electrical Engineering teams. He has aided the project as an Underclassmen Assistant for the past four academic quarters prior to achieving senior standing.

jonathanf@cpp.edu

Notes: