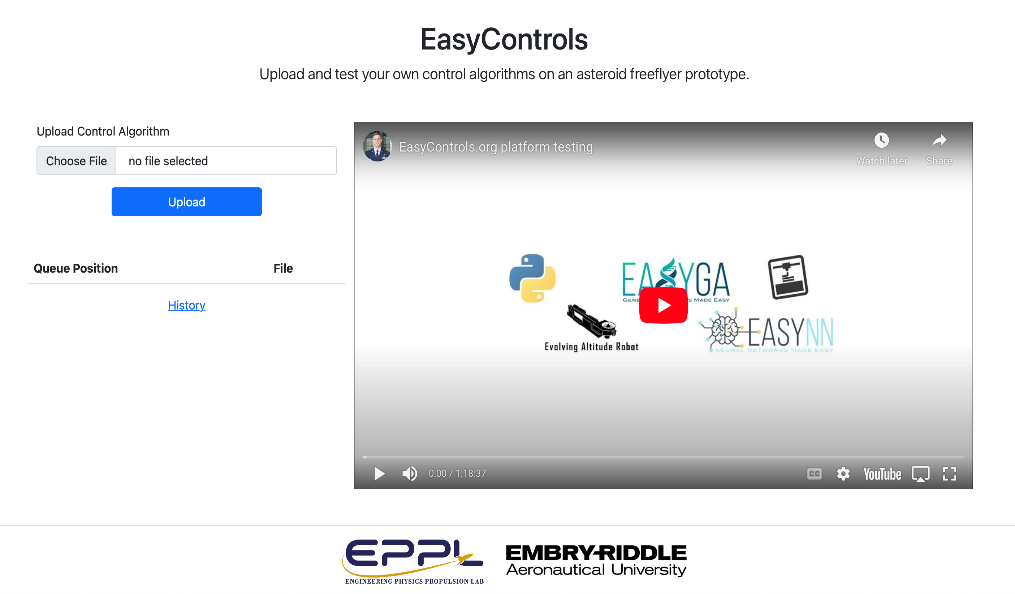


# **Integrated Spacecraft Autonomous Attitude Control (ISAAC)**

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| --- | --- | --- | --- |
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A circular object with many blue lights

Description automatically generatedSatellites are essential in today’s day in age, yet very expensive for a student, teacher, or  
researcher to make/buy for learning purposes and experiments. To bridge this connection from  
money to knowledge, we are developing ISAAC *(Fig. 1),* which will be available to the user via the  
*easycontrols.org* website *(Fig. 2 ).* This is an open-sourced, 3D-printed attitude controller that will  
sit inside a 3-axis gimbal ring. This setup simulates a microgravity environment, allowing the user  
to test their control algorithms. ISAAC uses a Raspberry Pi as the server to compile the code uploaded  
to *easycontrols.org* and compressed air as a means of propulsion. From  
the website, the user will be able to watch a live stream of the craft trying to stabilize itself and  
the data being processed all at once. This shows the user how the theory and computation are applied to a  
real-world system, simulating that of a satellite in space. Allowing curious minds to learn and teachers, like Dr. Drakunov and Dr. MacKunis, to teach the theory and have their students watch as it unfolds.

*Fig. 2: The easycontrols.org website homepage*

*Fig. 1: ISAAC in a 1D apparatus*