SPACE DYNAMICS LABORATORY

PAYLOAD CHALLENGE

ESRA ID NUMBER	
UNIVERSITY	MIT MANIPAL
PAYLOAD NAME	GANDIVA
TEAM NAME	DRONA
FACULTY ADVISOR EMAIL, PHONE #	

Objective - Challenge teams to develop payloads that accomplish relevant function(s) while providing useful learning opportunities.

ENTRY FORM *(to be filled out by team; also fill out top portion of judging sheet)*

In order to enter the SDL payload challenge, this form must be submitted no later than two weeks prior to the start of the event.

Scientific or Technical Objective

(1200 characters max) and must fit within the window)

Payload intends to demonstrate real-time visual tarcking and stabilisation using a resistive touch screen during rocket flight. Raspberry Pi processes camera imagery for computer vision-based ball position detection, while Teensy 4.1 handles 4-wire resistive touchscreen coordinates and MG90S servos for stabilisation. BNO055 IMU provides flight phase detection and data on force faced by the system. The Primary Objective is to compare and infer the limitations of vision based tracking under high vibrational environments.

Failure & Hazard Analysis

Briefly describe possible failure modes and potential hazards. *(1200 characters max)*

Primary Failures:
1. Servo stall from excessive g-forces
2. Contact failures due to high vibration
3. Mechanical failure of joints under high g forces

Hazards: Payload contains no hazardous materials as per IREC DTEG guidelines.

Components & Materials Used

List the components and materials used ("Component" refers to purchased items, "material" refers to everything else). *(1200 characters max)*

COMPONENTS:
1. Raspberry PI4B
2. Teensy4.1
3. BNO055
4. 4-Wire Resistive Touch Screen
5. XPT2046
6. LED Ring
7. 6.6V LiFePO4 battry
8. Buc Converter
9. MG90S Servo

EMAIL FORM TO : PAYLOADCHALLENGE@SDL.USU.EDU

UTAH STATE UNIVERSITY
SPACE DYNAMICS LABORATORY

IREC
INTERNATIONAL ROCKET ENGINEERING COMPETITION

(team fill out top portion only)

JUDGING FORM

SPACE DYNAMICS LABORATORY

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TEAM NAME	
FACULTY ADVISOR EMAIL	

IREC payload compliance:

SCORE

TO BE FILLED OUT BY JUDGES

1.	Removable from the rocket	NO	YES
2.	Not affect the flight of the rocket if removed and replaced with ballast	NO	YES
3.	Totally recoverable	NO	YES
4.	Not contain any live, vertebrate animals	NO	YES
5.	Not contain significant quantities of lead or other hazardous materials	NO	YES
6.	Technology Relevance Award: Robotics, Artificial Intelligence, or Infrared	NO	YES

Total IREC deduction or bonuses

Payload Challenge Judging Criteria

Scientific or Technical Objective(s) *› Scientific or technical relevance, experimental approach, etc.* *(400 points)*

Payload Construction and Overall Professionalism *› Includes make/buy decisions, craftsmanship, material usage, poster, handouts, reports, etc.* *(250 points)*

Readiness / Turnkey Operation *› Will the payload interfere with launch operations? Will the payload operate after hours of launch preparation, rail time, heat, waiting for other launches, etc?* *(50 points)*

Execution of Objective(s) *› How well did it accomplish the objective(s)?* *(300 points)*

Note *that no report equals zero points and rocket failure results in 150 points (half credit – not known if payload would have worked or not)*

TOTAL PAYLOAD CHALLENGE SCORE

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