MMAE 412 Space Mission Design Project
Spring 2022

The Mission

Your design team is tasked to develop a proposal for a mission in response to the NASA CubeSat Launch Initiative (CSLI) solicitation (pdf on Blackboard). As stated in that document, CSLI missions must have objectives that align with NASA's strategic plan (pdf for the 2018 NASA Strategic Plan is on Blackboard). This project is to be accomplished entirely within the assigned teams consisting of three to five students each. No collaboration is allowed outside of the team other than with instructors.

Possible mission topics include but are **not** limited to the following. For the topics listed below you may consult with the named stakeholders.

1. **Goal –** to examine the response of a Near Earth Asteroid (NEA) to an impact and to provide detailed examination of the morphology (body shape), surface features and internal composition/structure.
    a. Science principal investigator: Dr. Geza Gyuk, Adler Planetarium
        i. Email is ggyuk@adlerplanetarium.org
2. **Goal –** to deploy and test the behavior of a granular soft robot in space, for future scientific applications.
    a. Technology principal investigator: Prof. Matthew Spenko, Illinois Tech
        i. Email is mspenko@iit.edu

Any team may consult with the contacts listed above. If doing so, designate one team member to be the point-of-contact (POC) for the team. The POC may email the stakeholder, and copy me, with the team's questions relating to the mission scope or other technical needs.

For more about CubeSats visit:
https://www.cubesat.org/resources/

Deliverables

1. **Midterm presentation: Mission Definition Presentation**

On the midterm date given in the class schedule, each team will provide a 5-10 minute Powerpoint presentation describing the mission concept, architecture, orbital parameters, and launch considerations, along with an electronic copy of the slides submitted by the upload deadline in the schedule.

2. **Midterm report: Mission Definition Report**

By the midterm report date, each team will submit a written report elaborating on the presentation. A template outlining topics to be discussed will be provided.

3. **Final presentation: Preliminary Design Review**

During the last week of class meetings each team will present a 15-20 minute presentation summarizing the overall design, along with an electronic copy of the slides.

4. Final Report: Mission Proposal

The final report is where you document the details of the design. The design must consider all facets of the space system design process. The criteria by which the proposal will be reviewed and required proposal elements are part of the solicitation. An electronic copy of this report is due by the upload deadline listed in the schedule.