



PROPOSAL GUIDELINE

NASA Spacesuit User Interface Technologies for Students

Date: August 20, 2018



National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas 77058



Team Name

Optional Team Logo

Academic Institution Name

Address

Team Contact

Student Name

Email Address:

Phone Number:

Team Members

(Please list ALL team members)

Team Member Name --- Role

Email Address --- Academic Year / Academic Major

Team Member Name --- Role

Email Address --- Academic Year / Academic Major

Team Member Name --- Role

Email Address --- Academic Year / Academic Major

Team Member Name --- Role

Email Address --- Academic Year / Academic Major

Team Member Name --- Role

Email Address --- Academic Year / Academic Major

Faculty Advisor

Name

Email Address:

Phone Number:

Faculty Advisor Signature

Date



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(Note: A limit of 12 pages is enforced for the Technical Section. Include enough pictures within this 12 pages to describe your tool. If you want to submit large numbers of pictures, they can be added in an Appendix and will not count against your 12 pages.)

1. Letter of Intent

Each team must **submit a Letter of Intent by September 27, 2018** indicating the team's intention to submit a written proposal. The Letter of Intent should follow the format below and be written in the body of an email. Send the email directly to NASA-SUITS@mail.nasa.gov

- a. Provide a Team Contact information, this should be a student team member
 - a. Sample: *Doe, John (DoeJ@institution.edu) Sophomore / Software Engr
- b. Provide the Academic Institution name (military academy, technical college, community college, or university) you represent
- c. State: *"We plan to submit a proposal for the NASA SUITS Challenge."*

2. Proposal Requirements

- Each team must submit 1 electronic copy of an original proposal
- Each proposal must be submitted in a three-section format containing the required sections in the order as listed: Technical, Outreach Plan, and Administrative
- Sections or components shall not be skipped/omitted under any circumstance
- The Technical section shall not exceed 12 pages including title page
- Body of report shall use 12-point font
- All information on title page must be completed
- Figures shall be labeled and referenced within the text
- Tables shall be labeled and referenced within the text

3. Technical Section

The technical section should include information on the design the team is proposing. This section should include any information that a technical reviewer might find informative or instructive in understanding the aims and goals of the design. Evaluators ranking the proposal for its scientific merit will read only this section, so teams should be sure to address all relevant factors as listed below.

a. Abstract

The abstract should be a brief (up to 300 words) summary that touches upon the elements of the prototype design being proposed.

b. Design Description

This section should include a brief, but detailed description of the display being proposed. It should be written so that a practicing engineer or scientist can understand the design of the user interface (UI). Goals should be presented along with a description of the expected results. Showing conceptual UI design ideas (portrayed via wire frames, visuals, etc.) and innovative display interaction methods/technologies are strongly desired.

c. Concept of Operations (CONOPS)

Describe the overall high-level concept of how the user interface will be used to meet the expectations and requirements. Describe the system from an operational perspective (viewpoint of the astronaut) to help facilitate an understanding of the system goals.

d. Human-in-the-loop (HITL) testing

In this section, student teams shall discuss any pilot, user experience, human-in-the-loop, or human factors studies planned. A written HITL test plan should include a test protocol, possible metrics/measures, feasible subject pools, and the expected population/demographics of test subjects.

e. Team Project Schedule

This section of the report should provide an outline the team's development plans, with any internal key milestones. A Gantt or similar chart should be used. Teams are strongly encouraged to plan time to test their code before traveling to NASA Johnson Space Center for test week.

f. Technical References

Referenced works should be cited in text and in the "Bibliography". Standard MLA format should be used. Make sure that references are relevant.

4. Outreach Section

The outreach section of the proposal will include the team's plan for disseminating the results of its experiment/experience to the general public. Information contained in this section should focus on what outreach activities the team intends to do and what audience will be addressed. The outreach plans must be original to the team and **the proposal should not be posted on any social media.**

A plan is an organized way to achieve a specific objective. Random activities, even good random activities, do not constitute a plan. An outreach plan should have two major components:

The PLAN – a description of the team’s objectives and goals; what activities are planned for the upcoming year; where and when the activities will take place; what audience will be targeted, etc.

The ACTIVITIES – what will the team do when they get there? What materials will they refer to? What are the main points that they will make?

For maximum point value, the plan should include the following:

- the team’s objectives in each outreach activity
- a description of the outreach audience (K-12 class or school groups, undergraduate research symposiums, university outreach to local schools, informal groups such as Boy/Girl Scouts, after school clubs, church groups)
- specific plans for activities (Strengthened by incorporating alignment of an activity to state or national standards that will help a K-12 teacher, use of the 5E Model, or use of age/grade appropriate language during the activity)
- letters or agreements from institutions who have accepted your invitation to address their group
- a press and/or social media plan
- a connection between curriculum/activity and NASA SUITS, the HIVE, the EVA technical team or the team’s code

5. Administrative Section

a. Institutional Letter of Endorsement

This letter must be on the endorsing institution's letterhead and must come from the institution president, dean of college, or department chair. It indicates that the team's institution has knowledge of the team's interest in participating in this activity and endorses the team's involvement. Teams will not be considered if their institution does not approve of their involvement.

b. Statement of Supervising Faculty

A statement of support from a supervising faculty member indicates a willingness to supervise and work with the team during all stages of the activity. Teams working without a faculty advisor will not be considered. The faculty advisor must also sign off on the cover of the proposal as evidence that he/she has seen the proposal and approves of the submission. The following statement should appear on institution letterhead and be signed:

As the faculty advisor for an experiment entitled " _____ " proposed by a team of undergraduate students from _____ university/college, I concur with the concepts and methods by which this project will be conducted. I will ensure that all reports and deadlines are completed by the student team members in a timely manner. I understand that any default by this team concerning any Program requirements (including submission of final report materials) could adversely affect selection opportunities of future teams from _____ university/college.

c. Statement of Rights of Use

These statements grant NASA, acting on behalf of the U.S. Government, rights to use the team's technical data, including computer software, and design concept, in part or in entirety, for government purposes. NASA, acting on behalf of the U.S. Government, may designate for certain tasks under this pilot program that software (including documentation) developed for such certain designated tasks be released as "Open Source" (OS) software, as that term is defined by the Open Source Definition promulgated by the Open Source Initiative on its website (see <http://opensource.org/docs/osd>). These statements are not required. However, teams

with a Statement of Rights of Use will receive greater consideration in the proposal selection. If choosing to include these statements, ALL team members and faculty advisors must sign. The statements read as follows: As a team member for a proposal entitled “ _____ ” proposed by a team of undergraduate students from _____ university/college, I will and hereby do grant the U.S. Government a royalty-free, nonexclusive and irrevocable license to use, reproduce, distribute (including distribution by transmission) to the public, perform publicly, prepare derivative works, and display publicly, any technical data contained in this proposal in whole or in part and in any manner for Federal purposes and to have or permit others to do so for Federal purposes only. Further, with respect to all computer software designated by NASA to be released as open source which is first produced or delivered under this proposal and subsequent collaboration, if selected, shall be delivered with unlimited and unrestricted rights so as to permit further distribution as open source. For purposes of defining the rights in such computer software, “computer software” shall include source codes, object codes, executables, ancillary files, and any and all documentation related to any computer program or similar set of instructions delivered in association with this collaboration. As a team member for a proposal entitled “ _____ ” proposed by a team of undergraduate students from _____ university/college, I will and hereby do grant the U.S. Government a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States Government any invention described or made part of this proposal throughout the world.

d. Funding and Budget Statement

This section should include a simple columnar layout showing expected expenditures associated with the proposed design (materials, machining, operating, testing, and shipping), transportation to/from Houston, and accommodations/food/transportation during test week in Houston, etc. It is imperative that teams anticipate all costs involved and actively work to seek funding. Potential sources for funding should be listed and can include institutional grants, state Space Grant funds, corporate sponsors, etc.

Teams should also identify a financial representative from their institution (college or department level). Be sure to include the representative’s name, title, and

email address. In the event a development stipend is awarded to the team by NASA SUITS, the program will coordinate directly with the identified financial representative.

Table 1 Travel cost

<u>Items</u>	<u>Costs</u>
Flights	\$4500.00
Hotel	\$3500.00
Ground Transportation	\$500.00
Food	\$800.00
Miscellaneous	\$400.00
Total	\$9700.00

e. Parental Consent Forms

The parental consent forms provide consent for general participation and must be submitted for any team member under the age of 18 that will be accompanying the team to Houston. This will be provided directly to teams that have been selected to participate onsite as applicable.

f. Proposal Scoring Method

Each proposal report will be evaluated using a scoring rubric (Figure 1) with criteria to address each of the following areas of the report: Technical Merit, Outreach Plan, and adherence to all proposal requirements.

- Factor 1: DESIGN DESCRIPTION (20% Weighted Value)
 - ✓ Describe the goals of the design concept and expected results
 - ✓ Provide conceptual UI designs and innovative display interaction methods
- Factor 2: CONCEPT OF OPERATIONS (20% Weighted Value)
 - ✓ Describe the user interface from an operational perspective (EVA astronaut)
- Factor 3: FEASIBILITY (10% Weighted Value)
 - ✓ Concept demonstrates a viable solution to the technical need
 - ✓ Plan describes how the concept would be produced
- Factor 4: EFFECTIVENESS OF THE PROPOSED PROJECT SCHEDULE (10% Weighted Value)
 - ✓ Comprehensive project schedule
 - ✓ Effective use of available Resources
 - ✓ Labor distribution
 - ✓ Document proposed schedule for meeting objectives
 - ✓ Detailed plan to achieve each objective or task.
- Factor 5: HUMAN-IN-THE-LOOP (HITL) TESTING (5% Weighted Value)
 - ✓ Provide a test plan for all HITL testing to be conducted by the team
 - ✓ Include all of the requested components for the HITL plan:
 - test protocol
 - possible metrics/measures
 - feasible subject pools
 - expected population/demographics of test subjects
- Factor 6: TECHNICAL REFERENCES (5% Weighted Value)
 - ✓ Referenced works are cited in text and are relevant to the proposal
 - ✓ A bibliography is presented in MLA format
- Factor 7: OUTREACH (30% Weighted Value)
 - ✓ Diverse list of events and activities planned
 - ✓ Includes projected audience type and number of participants
 - ✓ Detailed implementation plan

Figure 1 Scoring Criteria

Note: Please continue to check the NASA SUITS website for the most-up-to-date activity documents @ <http://go.nasa.gov/nasasuits>. Please send questions or responses to NASA-SUITS@MAIL.NASA.GOV.