

Act Using LLMs for Research Proposals: A Practical Tool for Defense-Focused Faculty

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Large language models (LLMs), like ChatGPT, Claude and Google Gemini, have changed the way we work. College and university campuses are no different. Students have been quick to apply LLMs to course work. Faculty are also leveraging them for lecture preparation and research. (Our colleagues at Stanford's Gordian Knot Center have taken the lead in [managing AI in the classroom](#).) Yet, very few are using LLMs to manage the complex, competitive, and time-consuming government funding process to win government funding.

We at Stanford's Technology Transfer for Defense (TT4D) have been. We use LLMs to navigate Broad Agency Announcements (BAAs), match research portfolios to government awards, parse lengthy solicitation documents, and generate draft proposals. The result has been winning 2X more proposals in half the time.

This post shares the steps, prompt strategies, and reviewer simulations we have found to be useful. A word of caution: While we are confident the steps below will increase your p-win rate and save time, these outcomes are not automatic. You must manually verify LLM output at each stage, especially eligibility details and submission deadlines.

Step 1: Finding the Right BAA or Funding Call

Defense agencies publish a wide range of open topics across disciplines: AI, quantum, hypersonics, cybersecurity, materials science, autonomy, and more. Finding the BAAs that align with your research typically involves visiting multiple websites, like Grants.gov, SAM.gov, or agency portals, manually searching for applicable research keywords before reading through each of the calls that the search returns. LLMs cut this time in half simply prompt your favorite LLM to identify relevant opportunities from the government websites listed above using this multi-step process:

Prompt 1:

"List all currently open Broad Agency Announcements (BAAs) from all Defense Department agencies (DARPA/ONR/AFOSR) related to (my research keywords e.g., Resilient AI for autonomous systems, bio-inspired unmanned aerial vehicles, additive manufacturing for battlefield repair). Include submission deadlines, program manager contact information, and required materials."

Prompt 2:

"Summarize the objectives and key evaluation criteria from [funding organization name listed in the BAA] and identify the deliverables and transition outcomes [funding agency] prioritizes."

Prompt 3 (Program Manager Simulation):

“Based on the BAA “title” and my research summary pasted below, act as a program manager at [funding agency] to assess how well-aligned my project is with the BAA’s goals.”

Step 2: Understanding and Responding to Requirements

Many defense programs require a proposal step, such as writing [a white paper](#), executive summary, and [one-pager](#), or [creating a quad chart](#), before being invited to submit a full proposal. Without LLMs, researchers typically sift through dense BAA text manually to cross-reference formatting guidelines and create drafts. Preparing these initial materials can take 10–20 hours per submission. We use LLMs to perform these tasks. In addition, we use LLMs to incorporate lesser known areas about the relation of the research to military relevance, [technology readiness levels \(TRLs\)](#), integration potential, and operational impact.

Prompt 1: (White Paper outline with Heilmeier Integration)

“Using this section from the [Agency name and BAA], draft a detailed outline for a [white paper] focused on resilient AI for [research keywords, e.g., autonomous systems operating in contested environments]. Ensure the outline aligns with [BAA name] formatting including placeholders for sections like Executive Summary, Technical Approach, and DoD Relevance and evaluation criteria listed in the BAA. Incorporate the following questions from the [Heilmeier Catechism](#): What are you trying to do? How is it done today, and what are the limits of current practice? What’s new in your approach, and why do you think it will be successful? Who cares? If you are successful, what difference will it make? What are the risks? How much will it cost? and explicitly address military relevance, current and projected Technology Readiness Levels (TRLs), integration pathways with existing defense systems, and anticipated operational impact.”

Prompt 2 (with added dimensions):

“Using the technical information in the white paper attached, generate a quad chart for a project on autonomous drone swarms, with sections on: Problem Statement, Proposed Approach, Key Innovations, and Impact. Include the content structured visually as a proper quad chart, in a clear and clean grid layout suitable for slide decks or proposal documents. Include a table of specific time horizon (2–4 years depending on the BAA requirement), anticipated operational users (e.g., SOCOM), and dual-use implications.”

Note: that quad charts expect an illustration in the first quadrant. The LLM should not be used for this.*

Prompt 3 (Program Manager Role):

“Act as a [funding agency’s name] program manager. Review the technical details attached below, suggest how to better align it with [funding agency name] mission and emerging technical focus and evaluation criteria.”

Step 3: Drafting Non-Technical and Strategic Sections

Writing technical sections is your domain, but LLMs can help you get something on paper for you to begin shaping. They can also assist with the more general sections of the white paper. For example, LLMs can help you interpret and reference strategy documents like the Defense Department’s [National Defense Science & Technology Strategy](#), [DARPA’s AI Forward framework](#), [Naval Research Development Strategy](#).

Prompt 1 (Strategy alignment):

“Write a paragraph explaining how my work on resilient satellite communication aligns with the 2023 National Defense Strategy.”

Step 4: Review Your Proposal Using BAA Evaluation Criteria

Here’s one of the most powerful (and often overlooked) ways to use LLMs: ask it to act like a reviewer. Most BAAs include evaluation criteria—things like scientific merit, relevance to defense missions, transition potential, cost realism, and team qualifications.

Paste in your white paper draft and the criteria, and LLMs can help you self-assess before submission. This doesn’t replace internal review, but it gives you a fast, structured way to identify gaps or clarify your argument.

Prompt 1:

“Using these evaluation criteria from Section V of the BAA, review my proposal draft and identify any weaknesses or missing elements.”

Prompt 2:

“Act as a reviewer for [funding agency name]. Evaluate this white paper based on mission relevance, technical merit, and transition potential.”

Prompt 3:

“Act as an [funding agency name] reviewer. Review the technical details attached below considering the evaluation guidelines summarized in the BAA. Suggest how to better align it with [funding agency’s] stated mission and emerging technical focus and evaluation criteria. Evaluate whether the broader impacts section adequately addresses dual-use potential and military transition.”

Final Thoughts

Writing competitive proposals for defense agencies takes deep expertise, strategic awareness, and a lot of time. LLMs can’t do the work for you, but it can make the process more manageable by identifying the right funding call to refine your language and strengthen your narrative. Whether you’re drafting a white paper, aligning with agency priorities, or preparing a full submission, LLMs can be a reliable partner in moving your proposal forward. As AI becomes more integrated into research and funding proposals, learning to use it well will give you an edge in how you plan, communicate, and compete.

Tips

- Always double check the LLM’s work. LLMs sometimes have a tendency to hallucinate and/or add citations and links that may not be accurate or even exist.
- Include specific parameters like timeline, military organizations that will benefit, and performance metrics to improve response accuracy.
- Avoid use of too many em dashes—a long dash (—) used in punctuation. LLMs love em dashes and too many are a telltale sign you let a LLM do your writing.

*Technology Transfer for Defense (TT4D) at Stanford University specializes in matching Defense Department funding with academic research projects. In the past six years, TT4D has worked with numerous faculty members at more than a dozen universities to help them win Defense Department grants and with the Office of Naval Research, totaling more than \$13 million, to support research funding and transition academic technologies from lab to defense capabilities. TT4D is based at Stanford University and is run by **Jeffrey Decker, PhD**, program director, Precourt Institute for Energy, **Fu-Kuo Chang**, Professor of Aeronautics and Astronautics, and **Nilay Papila, PhD**, senior program manager, Precourt Institute for Energy. To contact the TT4D team, visit techtransferfordefense.stanford.edu.*

To read previous TT4D posts, see:

1. [TT4D: Getting Defense Department Grants](#)
2. [TT4D: Tech Transfer for Defense's 4-Step Guide to Winning Defense Department Research Funding](#)
3. [TT4D: How to Find Existing Research Broad Agency Announcements](#)
4. [TT4D: Contacting the Program Manager and Seeking Feedback](#)
5. [Technology Transfer for Defense: Leveraging the Heilmeier Catechism: A Blueprint for Effective Project Framing](#)
6. [TT4D and Researchers Looking for Government Financing \\$\\$\\$: Prepare and Submit Your Application](#)
7. [TT4D: Maximizing Your Event's Impact with Army Conference Support](#)
8. [TT4D: Where Defense R&D Money Comes from and Why it Matters](#)
9. [TT4D: Frequently Made Mistakes in Research Proposals: What to Avoid for Success](#)
10. [TT4D: Technology Transition and Research: Using Defense Department Research Categories and Technology Readiness Levels in Your Research Proposals](#)
11. [TT4D Can Help YOU Secure DoD Research Funding](#)
12. [How to Effectively Complete a Quad Chart for Government Research Projects](#)
13. [Spinning Out Defense-Funded Innovations: A Guide for Researchers-Part 1](#)
14. [Spinning Out Defense-Funded Innovations: A Guide for Researchers-Part 2](#)