Engineering, Mathematics, and Computer Science (EMCS) STAR Research Statement Guidelines

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EMCS is a broad classification, and there are significant differences in what we expect from a research statement even when comparing the three sub-disciplines of Engineering, Mathematics, and Computer Science. Be sure to work closely with your faculty mentor to ensure you are aligning with disciplinary expectations (although you should also be sure that everything you actually write is in your own words). In general, however, we expect a research statement to consist of the following components.

1. **Background and context.** Give an introduction to the general area in which you will be working, the type of problem you will be working on (though not your specific problem), a brief overview of what has been done before in this area, and why it matters. You aren't expected to already know about all this when you start writing your proposal, so expect to do some reading; your faculty mentor should be able to suggest suitable places to start. Write for a broad scientifically literate audience: don't try to "sound like an expert" and refrain from including technical details and jargon unless absolutely necessary. Remember that of the faculty reading your application, you can only expect about one-third to be in your sub-discipline (E, M, or CS), and even those may not be in your specific major (e.g., mechanical vs. electrical engineering). If they cannot understand what you've written, they are unlikely to score it highly.

2. **Deliverables / Objectives.** State the main goal of your proposed project. If there are interim milestones that you intend to reach at specific points during the summer, list those as well, with approximate dates. The faculty reading your application understand, perhaps better than you do, that research is inherently uncertain and plans may change, perhaps drastically; but having a plan will help keep you focused, and shows that you have gone into some detail with your faculty mentor.

3. **Methods / Activities.** Briefly describe how you will work towards meeting the above goals. What do you expect to be spending your time doing? Will you be proving theorems, writing code, or fabricating things? What roles will you and your advisor (and any other research group members) play, and what has prepared you for your role (e.g., coursework, other projects, internships)? You do not have to go into a lot of detail, since in many cases, learning the details will be part of your project. Be as specific as your present understanding allows (usually obtained from discussion with your faculty mentor), but not more so.

4. **Resources to be used.** If you will be using specific software, tools, laboratory resources, etc., briefly describe them and their role in the project. Do you already have access to these tools and the skills to use them? If not, what is your plan to gain access and/or proficiency?

5. **Anticipated outcomes.** If the project is successful, what effect do you hope or expect for it to have? To whom will the results of your project be useful (i.e., who are the stakeholders), and how do you intend to disseminate your results to them and/or apply your results yourself?

6. **Preparation.** Why are you an appropriate person to engage in this project? What courses, study, experience, or prior work has prepared you to be successful? Address the specific activities and resources to be used in the project and your preparation for them.