Top Ten Mistakes to Avoid in Writing CAREER Proposals

CISE Mixed Advisory Taskforce on Technology, Education, Research and Science (CISE MATTERS)
Number 10: Fonts Too Small

- Small fonts promote reader fatigue
- Reviewers DISLIKE small fonts
- PAPPG mandates:
  - 11 point font minimum
  - 1 inch margins
  - 6 lines max per vertical inch

See: https://github.com/nsf-open/nsf-proposal-latex-samples
Number 9: Figures Illegible

- Avoid “crowded” visuals
- Don’t assume reader will print in color
- Use vector graphic formats
Number 8: Acronyms and Abbreviations

- Acronyms constitute a **private language** that excludes the reader.
- Acronyms are often **cryptic**, and make text hard to read.
- Reader will NOT memorize your abbreviations!
Number 7: Dissing the Competition

• **Good idea:** Citing others’ work
• **Bad idea:** Slighting others’ work

(“Others’ work” might be sitting on the panel)
Number 6: Poor distinction between preliminary results and proposed work

- Make a clear demarcation
- Distinguish your results from others’
- Set clear objectives
- Identify obstacles you anticipate
- Highlight what you bring to the table
- Include a validation plan
Number 5: Misleading Project Summary

PROJECT SUMMARY

Objective
Cyber physical systems (CPS) are engineered systems with built-in seamless integration of computational and physical components. Fundamental development in sensing, control, and information technologies have contributed to a new generation of"systems" that are cyber-physical in nature. Cyber-physical systems (CPS) span a broad spectrum of applications, from transportation systems to healthcare, smart homes, and industrial automation. The development of CPS has led to the creation of new opportunities for innovation and efficiency, as well as new challenges in terms of security and privacy.

Intellectual Merit
This project is centered on analyzing and designing algorithms that can work seamlessly with the new cyber-physical systems. The focus is on developing a new network management framework that can coordinate the allocation of network resources across different layers of the network hierarchy. The ultimate goal is to create a network management system that can optimize network performance and resource allocation for CPS, even when the underlying system is dynamic and unpredictable.

To this end, the research objectives are organized into three broad categories:

1. Online resource optimization and algorithms for dynamic network management.
2. Off-line and on-line resource allocation and service provisioning for applications in cyber-physical networks.
3. Real-time traffic control and congestion control mechanisms in networked systems.

Broader Impacts
The project expects to develop new algorithms and techniques that can be applied to a wide range of cyber-physical systems, including transportation, healthcare, and industrial automation. The expected outcomes include:

- Development of new algorithms and techniques for resource optimization and allocation in cyber-physical systems.
- Improved performance and reliability of cyber-physical systems through the development of new network management frameworks.
- Enhanced security and privacy of cyber-physical systems through the development of new algorithms and techniques.

The project is expected to contribute to the broader research community and to the development of new technologies and applications in cy
Number 4: “It wasn’t clear ...”

**Symptoms:**
- Long-winded explanations
- Too many superfluous details
- Poor organization of thoughts into words

**Remedies:**
- Use fewer words
- Read first two pages aloud
- “Make every word tell”
Number 3: Lackluster Education Plan

• Should be integrated with research plan
• Think beyond your present teaching duties
Number 2: Confining yourself to your PhD work

• CAREER proposal should be forward-looking
• Move above and beyond your PhD work
• “Imagine a world ...”
Number 1: Research Plan lacking Cohesion

- Don’t staple together unrelated ideas
- Don’t offer a laundry list with no prioritization
- Don’t make everything look like a nail to your one hammer
- Tell a story with your narrative
Questions?