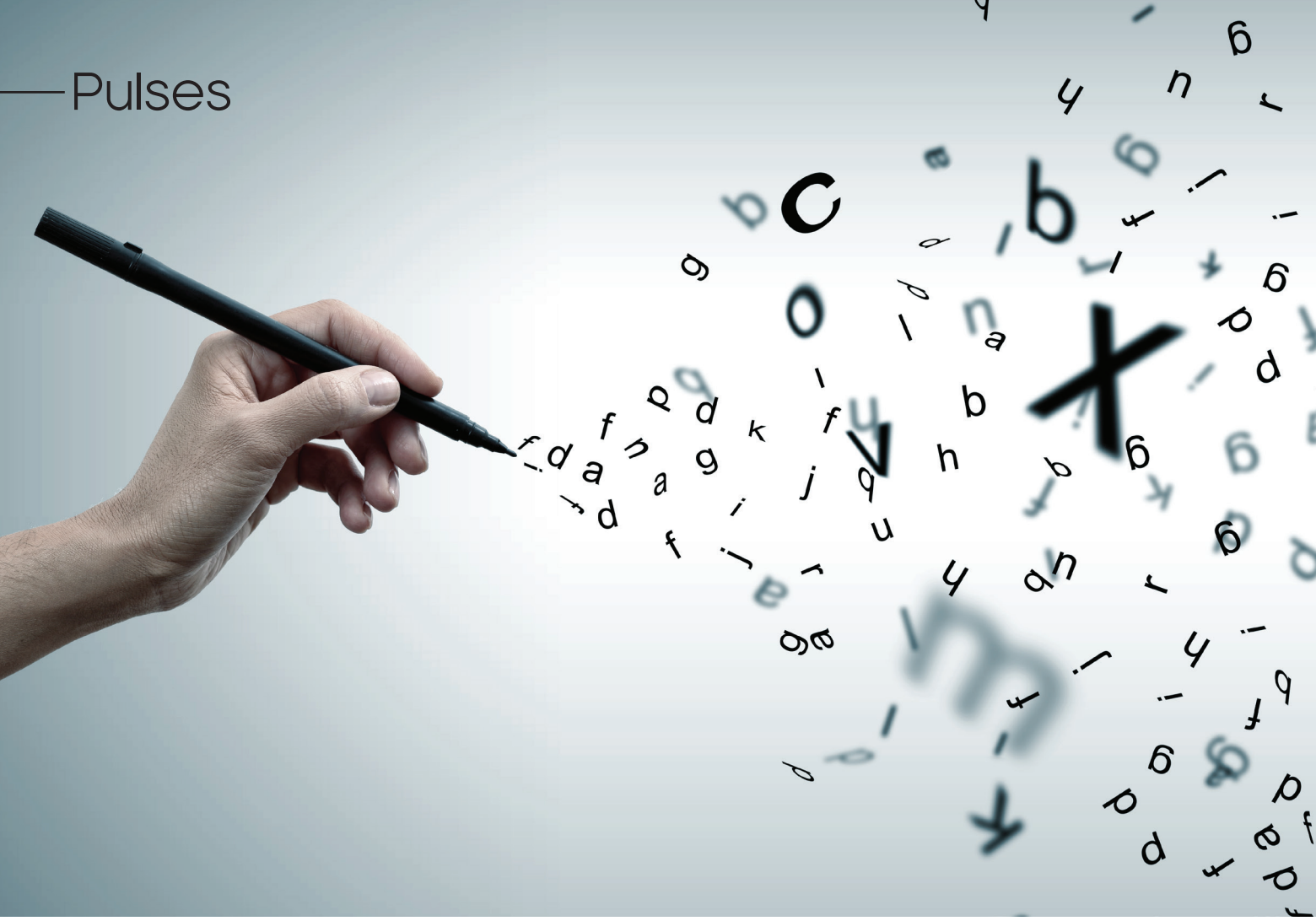

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CAREER FOCUS

Allow Me to Introduce Myself

Don't let an ineffective introduction deter readers from appreciating your research—reel them in from the very first paragraph.

Alan E. Willner

First impressions matter. On a blind date, armed with only a few bullet points of background information, two strangers spend a little time together to see if there is a spark of interest. In many ways, it's the same with your readers when they encounter your research paper. They see the title, which sparks their interest to read the abstract, then maybe the introduction, then possibly the whole paper.

This is true not only for your casual reader but also for reviewers of journal or conference manuscripts. Often, these key audience members will judge the value of a paper very early on, forming an immutable first impression that colors the rest of your work.

I have seen many excellent research results go relatively unnoticed because they didn't capture the interest of the reviewer or the general audience. Often the problem is simply that the key points are buried too deep or only weakly mentioned in the paper. A good introduction can help, by "funneling" the reader's attention to the most important material. Here's a way to do just that.

The four questions

I typically advise my students to make sure that the introduction answers four basic questions—progressing from broad to narrow—that will help focus the reader's attention on your paper's specific contribution.

If readers can't readily glean the answers to these questions, they may not understand the work's context and overall value—and may lose interest.

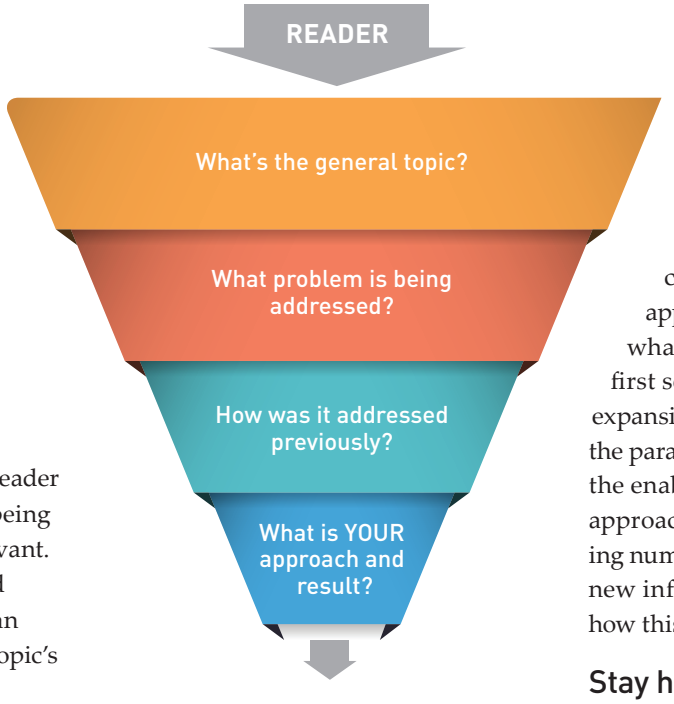
1. What sub-field does the paper deal with?

The paper needs to tell the reader the broad topic area that is being discussed and why it is relevant. This should be accompanied by general references that can authoritatively explain the topic's importance.

Often, the hardest part is to decide the angle from which to form the story. For example, if you use a type of laser for accurate imaging, do you describe the importance of that type of laser or the importance of accurate imaging? In other words, do you emphasize the core technology or the advance in capability? My recommendation is to pick the angle that best highlights your specific research advance over prior art. Are your results coming from "a novel laser applied to imaging" or "a laser producing a new imaging result"?

2. What problem is the paper trying to address?

Don't violate causality. Giving research results before identifying the specific problem or research challenge being addressed is a great recipe for confusing the reader. State the challenge that your paper tackles in the clearest possible terms so that the reader does not need to guess. In the laser-for-imaging example, are you motivated by a problem with the laser tuning speed, the imaging resolution, or something else? The rest of your paper would then be viewed through this lens.



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3. How did previous work try to solve this problem?

The odds are high that your work builds intellectually on other published work, so highlight direct prior advances succinctly and clearly. This paragraph can make or break your paper; write it carefully, ideally in just a few sentences. It is often helpful to give a general statement with several references, incorporating various approaches that your work does not directly rely upon—for example, non-optical approaches or optical approaches using a completely different technology. A word of caution: Be very careful not to denigrate prior art, but rather point out dispassionately what was and wasn't previously accomplished.

4. What specific advance does this paper report?

Showtime! Now's your chance to summarize in approximately five sentences what you have achieved. The first sentence could be a simple expansion of your title. The rest of the paragraph should clearly explain the enabling intellectual idea and approach; the key results (including numbers if highly relevant); what new information was learned; and how this is an advance over prior art.

Stay humble

A final thought about introductions—readers appreciate humility. To this point, I have two suggestions.

First, avoid judging your work or other people's work, and simply state the facts. Avoid calling your results "significant" or "dramatic." State that your result "is 10 times faster than prior art," and let the reader judge.

Second, many a reader will stop perusing a paper if an introduction makes a definitive, grand claim that is not substantiated. For example, the claim that "this laser will impact imaging" could elicit grumblings—and even a paper rejection—based on all the current problems with applying this technique to such an application. Yet, the statement "this laser has the potential for future use in imaging" is a lot easier to swallow, especially if accompanied by references that can substantiate this possibility pending further advances.

Carefully funneling readers to understand the context of your work will hopefully pique their interest to read past the introduction and appreciate the value of your research. OPN

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