

Journal of
Micro/Nanolithography,
MEMS, and MOEMS

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Plagiarism

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Plagiarism remains a difficult and important issue in scientific publishing. SPIE, with its many peer-reviewed journals and conference proceeding publications, deals with a number of plagiarism cases each year, ranging from the minor (fixable with editing and education) to the major (sometimes requiring retraction and author sanctions). And even though copying is easier than ever to detect using automated tools such as Similarity Check (formerly known as CrossCheck), the problem persists.

Plagiarism is generally defined as taking another's ideas, images, or words and representing them as one's own. It is intellectual theft. But despite this seemingly clear definition, my experience is that defining and identifying plagiarism in practice is much more complicated and nuanced. Often plagiarism is more a consequence of intellectual laziness than intellectual dishonesty. While I want to believe that everyone attempting to write and publish a scientific paper has the same ethical understanding of the concepts of plagiarism as I do, I know this is not the case. So, let's parse our definition of plagiarism and see how it applies to the practices of writing and publishing a scientific paper.

1 Copying Another's Ideas

It is a bedrock principle of science that each new work builds on the foundation of past work, so that making use of another's ideas is not only allowed, but encouraged. The ethical lapse comes from misrepresenting those ideas as one's own. Such misrepresentation can be explicit ("We present here for the first time. . ."), but is most often implicit. By presenting ideas, designs, models, processes, or results without citations, there is a clear implication that these ideas are original. Thus the plagiarism of ideas can also be considered a lapse in proper citation practices. The first defense against the plagiarism of ideas is to be very familiar with the right and wrong ways to cite prior work.¹

A missing citation is not necessarily evidence of plagiarism. After all, many ideas have been formulated independently by different people, and no one is familiar with all of the literature, even in narrow fields. Authors are expected to make a concerted effort to find relevant literature and cite appropriately, but missing citations are generally dealt with in the review and editing process without any implications of

wrongdoing. Partly this is due to the difficulty of proving the intent to inappropriately copy another's ideas.

2 Copying Another's Images

Figures are an important part of scientific communication, and the generation of a figure or other image is generally a creative act. As such, the use of another's figure requires not only a reference to its original publication but permission from the figure's author (and possibly the publisher) as well. Slight modifications to a figure (the equivalent of image "paraphrasing") are not enough to escape this requirement. Of course, some images have little or no creative content (block diagrams of a common experimental setup, for example), and present few options for a different representation. But thanks to the human brain's incredible ability to process images quickly and efficiently, it is generally safe to say that I know a copied image when I see one.

3 Copying Another's Words

By far the most common plagiarism problem that I am forced to deal with is the copying of another's words. Writing well is hard work,² and the reward for that work is often limited to the credit one receives for its publication. Thus, stealing words, taking the credit that rightly belongs to another, besides being inherently dishonest, can rob an author of the reward that may have justified the original effort.

The severity of an act of text copying can vary greatly, from the wholesale copying of an entire paper to the inadequate paraphrasing of a few sentences. While copying text (without quoting) is never allowed, the magnitude of the problem depends on several important factors:

- Was the source of the copied text cited? The lack of a citation is considered evidence of an intent to deceive, as opposed to carelessness or poor writing practices.
- How many sentences were copied? The greater the amount of copying, the greater the offense.
- Was there paraphrasing, or merely an attempt to disguise copying? Slight changes to a word or two of a copied sentence are not the same as rewriting in your own words. Note that paraphrased passages still require a citation to the original.
- Is any of the copied text claimed to be a novel aspect of the paper? Copying limited to background material or the methods section is still plagiarism, but not as egregious as the copying of results or their interpretation.

The last bullet point is worth exploring in more detail. Some authors seem to think copying text that merely describes the background of the field of study (in the Introduction section) or that describes an experimental procedure that is not new (in the Methods section) is somehow exempt from the rules against plagiarism. This is not true. If the words are not your own, then you are quoting someone else, and to quote someone else requires quotation marks (or indented text) and a citation.

4 Duplicate Publication ('Self-Plagiarism')

The term "self-plagiarism" is an oxymoron: you can't steal from yourself. Still, the term is often used to describe a serious

problem: misrepresenting previously published work as new. Such duplicate publication without proper citation is sometimes used by authors to increase their publication counts, hoping that editors and reviewers won't notice the lack of novelty in their latest submission. The harm here is to the journal and its readers, who waste their time reviewing and reading old work thinking there is something new to learn. Unlike a missing citation to someone else's work, authors can't claim ignorance as an excuse for not citing their own prior work. Thus, duplicate publication is a serious ethical violation. Note that this true for the Introduction and Method sections as well as for the Results and Discussion section. If you copy your own text or figures, cite it. If your new work is a continuation of your old work, cite it. Make sure the reader can easily distinguish between what is new and what is old.

SPIE has an explicit "proceedings to journal" policy that is designed to be author-friendly. Authors can submit a manuscript to an SPIE peer-reviewed journal that is based partly or even wholly on a paper published by those authors in a non-peer-reviewed conference proceedings. One important requirement of this policy is that the authors acknowledge the prior proceedings paper during the submission process. Further, the prior proceedings paper should be cited in the journal paper to avoid confusion for the readers. No implications of duplicate publication are attached to SPIE journal submissions that follow this procedure.

Occasionally, there are also copyright issues related to the reuse of one's previously published words or images. While SPIE grants blanket permission to authors to reuse their own words and images in a new publication (with proper citation), not all publishers do so. Thus, it is the responsibility of the authors to ensure that the copyright agreement they signed with the prior publisher allows word or image reuse by those same authors in a new publication, or to obtain written permission if not.

The idea of copying and reusing your own text (with citation) becomes more complicated if the author lists of the new and old papers are not identical. While you can't steal your own words, whose words are you taking when you copy from a paper that has some authors not found on the new manuscript? If the author list of the new paper does not include every author from the prior paper, text and ideas taken from that prior paper should be cited to give credit to the other authors of that work.

5 Some Cultural Issues

It is not a coincidence that the majority of plagiarism cases at English-language scientific journals involve non-native English speakers. I'm sure that the temptation to copy someone else's well-worded text rather than attempt rewriting it in one's own words must be strong when writing in English does not come easily. But I suspect that the most likely explanation for the higher incidence of plagiarism coming from foreign authors is probably cultural.

While the educational systems in countries like China and India are changing rapidly, there is still a strong emphasis on rote memorization and verbatim recitation as means of both learning and demonstrating learning. This is especially true when it comes to English-language source material, where exams often require the wholesale repeating of a textual

source in order to get the answer "right." An educational system that requires the memorization and repetition of another's words in order to succeed does not prepare a student well for our academic ideals of intellectual originality and attribution.

That said, widely accepted practices of attribution and prohibitions of plagiarism are firmly embedded in the scientific community's publication practices. I hope that universities will actively teach these standards to all science students, especially during their first few publication experiences (usually as graduate students).

6 Some Consequences of Plagiarism

The consequences of plagiarism for the authors depend on the severity of the ethical misconduct. The SPIE Code of Ethics has this to say about plagiarism and duplicate publication:

There are varying degrees of plagiarism warranting different consequences and corrective action, listed below from most to least serious:

- Verbatim or nearly verbatim copying or translation of a full paper(s), or the verbatim or nearly verbatim copying or translation of a significant portion(s) of another paper(s).
- Disclosing unpublished data or findings without permission, even if attributed.
- Uncredited verbatim or nearly verbatim copying or translation of individual elements of another paper(s).
- Uncredited paraphrasing of pages or paragraphs from another paper(s).
- Credited verbatim copying or translation of a major portion of a paper without clear delineation (e.g., quotes or indents).

The degree of corrective action will be commensurate with the degree of plagiarism.

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If duplicate publication in peer-reviewed journals is suspected, the investigating/enforcing body will confirm this by assessing the similarity and determining the paper's publication history. An attempt will be made to coordinate corrective actions with the editor(s) of the other publication(s).

Sometimes, minor lapses in plagiarism standards caught during journal submission can be fixed during editing with nothing more than a warning to the authors. More serious cases almost always result in the rejection of the submitted manuscript. For the most egregious cases, where intent to deceive can be reasonably established, rejection is accompanied by a ban on publishing with SPIE for one to several years (or even a lifetime ban in some extreme cases). Except in very rare circumstances, authors are considered collectively responsible for their paper.

It always disturbs me to see an example of plagiarism. I hope I will see fewer and fewer as the years pass.

Chris Mack
Editor-in-Chief

References

1. Chris A. Mack, "Editorial: How to Write a Good Scientific Paper: Citations," *J. Micro/Nanolith. MEMS MOEMS* **11**(3), 030101 (2012).
2. Chris A. Mack, "Editorial: How to Write a Good Scientific Paper: Style," *J. Micro/Nanolith. MEMS MOEMS* **15**(3), 030101 (2016).