

EDITORIAL

Editorial: Plagiarism Is For Losers

This issue presents two useful applications of formal modeling. The first paper, *Specification guidelines to avoid the state space explosion problem*, by Groote, Kouters, and Osaiweran, give a technique for security testing of firewalls. They formally model firewalls, and then combine testing with a proof technique to verify the correctness of the implemented firewall. (*Recommended by Alan Hartman.*) The second paper, *Formal firewall conformance testing: An application of test and proof techniques*, by Brucker, Brügger, and Wolff, is based on years of experience building state-based models. The authors have found that some models make testing and verification much easier than others, and give guidance for designing useful models. (*Recommended by Ronald Olsson.*)

1. PLAGIARISM IS FOR LOSERS

This editorial explores different forms of plagiarism, discusses why people plagiarize, and offers strategies for avoiding unintentional plagiarism. The amount of plagiarism detected by STVR's editorial board has increased significantly in recent years. This increase might be due to multiple factors. Like most journals, STVR now uses an automated plagiarism detector that searches tens of thousands of papers for similarities. The increase might also be partly due to the general globalization of SWE research [1]. Still, another factor is that STVR receives more submissions than in the past. Regardless of why, we now desk-reject almost a dozen submissions to STVR every year. This editorial discusses plagiarism to help potential authors understand what plagiarism is and how to avoid it.

Let's start with definitions. The Oxford Dictionary defines plagiarism as 'taking someone else's work or ideas and passing them off as one's own' [2]. The Merriam-Webster Dictionary's definition says 'to use the words or ideas of another person as if they were your own words or ideas' [3]. Although stated differently, these definitions are consistent: plagiarism takes credit for something that originated with someone else. Note that copying from yourself, for example, repeating words, results, or figures from a previous paper, is not plagiarism. The previous paper must be cited, and the reuse could violate copyright laws, but the work was still yours. Based on my experience and readings, I identify eight different types of plagiarism:

Complete copying: Submitting most or all of a previously published paper as if it were your own.

Copying key results: Claiming credit for someone else's results, even by using different words.

Copying unpublished work: Copying words or results from an unpublished source, for example, an informal report, class presentation, or a personal conversation. A particularly egregious form is taking results from a paper that you reviewed and rejected. This form compounds the offense of plagiarism with an additional breach of professional reviewing ethics.

Copying auxiliary text: Copying sentences or paragraphs from sections of a paper that do not contain the key results, including related work and background.

Copying figures: Copying a figure from another paper or book without proper attribution.

Improper quoting: Missing quotation marks or improper reference to quoted text.

Guest authors: Including on the author list the name of a person who did not contribute to the work. This includes friends, former advisors, and colleagues who may need additional resume padding.

Ghost authors: Omitting an author from the explicit author list who contributed to the work. These are, in fact, authors, and omitting them is taking credit for their work—plagiarism. The only exception is if the authors explicitly ask not to be listed.

I will address authorship rules in more details in a future editorial. Next, I want to discuss why people plagiarize, then suggest ways to avoid plagiarizing. I discuss intentional and unintentional plagiarizing separately. This list, like the last, is certainly not complete, but is intended to be a representative sample of common reasons.

Intentional plagiarizing is the more troubling morally, and multiple reasons may come into play. People sometimes intentionally plagiarize out of *desperation*. They are required to publish and, for whatever reason, do not have the ability to write publishable papers. Others plagiarize because they simply *lack ethics*. They have very little sense of right and wrong, or perhaps are outright sociopaths. Another possible reason is simply *poor judgment*—they believe they would not be caught. Although resources on the Internet can make it easier to find material to plagiarize, that same access makes it easier to detect plagiarism. Sadly, some people simply *follow their PhD advisor's* lead, thinking plagiarizing is normal behavior. Perhaps the saddest reason is when people simply *cannot write*, so they copy text from those who can. This probably explains a lot of type 4 plagiarism. Additionally, some *lose faith* in the review and publication system, lose respect for the process, and plagiarize simply to satisfy the publishing requirements.

Of course, people also plagiarize unintentionally. Perhaps the most common reason is by *not understanding plagiarism*. Some PhD students do not understand plagiarism when they start the research work, so it becomes the advisor's responsibility to teach them. My university has recently started a seminar series for PhD students on ethical issues related to research, which includes specific discussions on plagiarism and authorship. Some authors unintentionally plagiarize out of *forgetfulness*. They read something, forgot they read it, and later thought they invented it. This is why we must keep good notes! Another reason is *working with the wrong co-authors*; their co-authors plagiarized, and they did not notice. Sometimes people are *simply ignorant*; they do not know how to properly quote, and thus indicate that something was theirs when in fact they meant to give credit. Others *plan poorly*, are late for a deadline, and take a shortcut by copying text from another source. Finally, some try to *paraphrase* someone else's words, and believe that changing a few words in a paragraph puts the paragraph in 'their own words.'

Regardless of the reason, it is important to point out that journal editors usually cannot know why a submitter plagiarizes. From a journal's point of view, plagiarism is almost always considered to be knowing, willful, and intentional. We have 'one strike and you're out' policies. If someone is caught plagiarizing once, we will not allow that person to publish in the journal again. Scientists' most important asset is their reputations, and being caught plagiarizing is often the end of a research career. It is considered a firing offense throughout the world. In US universities, it is one of the most common reasons why tenure is revoked.

Plagiarism can also be a time bomb that goes off years or decades later. Recently, several German politicians lost their jobs after plagiarism was discovered in their PhD dissertations [4].

In addition to avoiding plagiarism yourself, most scientists agree that we have a moral obligation to report plagiarism when we observe it. I would certainly be very disappointed if someone I respected knew about plagiarism in a paper submitted to STVR and decided not to tell me. Not informing a journal editor of a case of plagiarism is tantamount to condoning plagiarism, and some even consider not reporting plagiarism to be another form of plagiarism.

Finally, ethical authors would like to know how to avoid plagiarism (at least the unintentional types). This is not always easy. After all, we are supposed to 'stand on the shoulders of giants' in our research, but we must stand on those shoulders without appearing to steal their contributions. I suggest the following strategies to avoiding unintentional plagiarism:

- Understand plagiarism! (For example, by reading this editorial and some of the additional resources below.)
- Properly reference ideas that are not yours.
- Rewrite text that you want to use—even if your writing is not as good as the original author’s, honest mediocre writing is far better than stolen excellent writing.
- Reference the original paper when reusing figures, even when you redraw or change them.
- If an idea is unpublished, either contact the author directly or forget it. You may never, ever, use an idea that has not been published without explicit permission from the originator.

When in doubt, include a reference to where you got your idea. I am pretty sure no paper has ever been rejected from STVR for ‘too many references.’

2. ADDITIONAL RESOURCES

- NoPlagiat: Self-study tutorial for avoiding plagiarism and copyright issues, <http://noplagiat.bibl.liu.se/default.en.asp> (*last access November 2014*)
- The responsible conduct of research, including responsible authorship and publication practices, Ruth Ellen Bulger, <http://edepot.wur.nl/137683> (*last access November 2014*)
- On Being a Scientist: Third Edition, Committee on Science, Engineering, and Public Policy, National Academy of Sciences, National Academy of Engineering, and Institute of Medicine, 2009, <http://www.nap.edu/catalog/12192.html> (*last access November 2014*)
- ORI Policy on Plagiarism, US Department of Health & Human Services, ORI Newsletter, 3(1), December 1994, <http://ori.hhs.gov/ori-policy-plagiarism> (*last access November 2014*)

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4. Jump P. *A plague of plagiarism at the heart of politics*, *The Times Higher Education*, 16 May 2013. <http://www.timeshighereducation.co.uk/features/a-plague-of-plagiarism-at-the-heart-of-politics/2003781.article>, [last accessed November 2014].

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