

Algorithmic Proof Style Guide

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- Write in complete non-run-on sentences.
- Include diagrams whenever possible. Diagrams clarify your proof idea greatly and make the formalisms considerably easier to follow.
- Do not use adjectives, verbs, or nouns that do not have a clear mathematical definition. For example, unless the word “valid” is defined in your proof, do not write “Thus, vector a is valid.”
- Do not use pronouns. Always repeat the full noun instead. Using the full name is always clear and easy to read. Pronouns never help the reader, and are often confusing. Here is a list of common pronouns: this, that, these, those, it, etc.
- Do not use future or past verb tenses in your proof. Say, for example, vector a changes throughout the algorithm. Do not write “Vector a had value b before iteration i , however, after iteration i , it will have value c .” This can get very confusing very quickly. Introduce some simple notation instead. For example, “Let a^i be the value of vector a at the start of iteration i . We have $a^i = b$ and $a^{i+1} = c$.”
- Do not introduce unnecessary notation. This confounds the reader. Keep the number of definitions, subscripts, and variables at a minimum. For example, if you only need to speak about one iteration of an algorithm, write “Let v and v' be the value of vector a at the start and end of iteration i , respectively. We have $v = b$ and $v' = c$.” There is no need to introduce unnecessary superscripts.
- Find small self-contained lemmas which help your proof. Reading the proofs for these small lemmas is much easier than reading a long multi-page proof.
- Do not write C-style code where English pseudo-code will suffice.
- *Never* use phrases such as “Obviously,” “It is easy to see,” “Clearly,” “Note that,” etc. They add no value to your proof.
- Do not use parenthesized expressions (like this parenthesized expression).
- Remember that verbosity is not the same as clarity. Make your proofs as clear as possible.