بسم الله الرحمن الرحیم

روش پژوهش و ارائه

درس ۷

اصول خاص سبک نگارش

Writing Style Specifics

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اصول خاص سبک نگارش:
اصولی که نویسندگان باتجربه از آنها در کارهایشان پیروی می‌کنند.

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عنوان‌ها
و
سرفصل‌ها

Titles and Headings

Titles of papers and sections should be concise and informative, have specific rather than general terms, and accurately describe the content. Complicated titles with long words are hard to digest.

✗ A New Signature File Scheme Based on Multiple-Block Descriptor Files for Indexing Very Large Data Bases

✓ Signature File Indexes Based on Multiple-Block Descriptor Files

✗ An Investigation of the Effectiveness of Extensions to Standard Ranking Techniques for Large Text Collections

✓ Extensions to Ranking Techniques for Large Text Collections

Don't make the title so short that it is contentless. "Limited-Memory Huffman Coding for Databases of Textual and Numeric Data" is awkward, but it is superior to "Huffman Coding for Databases", which is far too general.

Accuracy is more important than catchiness—"Strong Modes Can Change the World!" is excessive, not to mention uninformative. The more interesting the title, however, the more likely that the text underneath it will be read. The title is the only part of your paper that most people see; if the title does not reflect the paper's contents, the paper will not be read by the intended readership.

The title is meant to capture something of the flavour of the contribution, and should not be misleading as to the scope or outcome of the work. For example, titles that begin "Towards …" can be disconcerting. If the title of the paper is "Towards Effective Blog Search", it suggests that effective blog search is not actually achieved in the paper, or that only one specific part of the broader problem has been tackled. It would make more sense to capture just that specific part of the problem in the title, and consider the broader context only when discussing the motivation for the work.

Titles and section headings do not have to be complete sentences; indeed, such titles can look rather odd.

✗ Duplication of Data Leads to Reduction in Network Traffic

✓ Duplication of Data to Reduce Network Traffic

Section headings should reflect the paper's structure. If a section is headed "Lists and Trees" and the first subsection is "Lists", another should be "Trees"; don't use, say, "Other Data Structures". If a section is headed "Index Organizations" the subsection heading should probably be "B-trees" rather than "B-tree indexes".

Headings may or may not be numbered. In a paper, my preference is to use only two levels of headings, major and minor, and to only number major headings. In a thesis, numbered chapters, sections, and possibly subsections, are appropriate. Deeper numbering allows more precise referencing, but often seems fussy. If all headings are unnumbered—as is required in some journals—make sure that major and minor headings are clearly distinguished by font, size, or placement.

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پاراگراف‌های افتتاح

The Opening Paragraphs

The opening paragraphs can set the reader's attitude to the whole paper or thesis, so begin well. All of a document should be created and edited with care, but take the most care with the opening, to create the best possible first impression. The abstract should be written especially well, without an unnecessary word, and the opening sentence should be direct and straightforward.

✗ Trees, especially binary trees, are often applied—indeed indiscriminately applied—to management of dictionaries.

✓ Dictionaries are often managed by a data structure such as a tree. However, trees are not necessarily the best choice for this application.

The following, which was the first sentence of a paper, is an example of how to begin badly.

✗ This paper does not describe a general algorithm for transactions.

Only later does the reader discover than the paper describes an algorithm for a special case.

✓ General-purpose transaction algorithms guarantee freedom from deadlock, but can be inefficient. In this paper, we describe a new transaction algorithm that is particularly efficient for a special case, the class of linear queries.

The first paragraphs must be intelligible to any likely reader; save technicalities for later on, so that readers who don't understand the details of your paper are still able to appreciate your results and the importance of your work. That is, describe what you have done without the details of how it was done.

Starting an abstract or introduction with "This paper concerns" or "In this paper" often means that results are going to be stated out of context.

✗ In this paper we describe a new programming language with matrix manipulation operators.

✓ Most numerical computation is dedicated to manipulation of matrices, but matrix operations are difficult to implement efficiently in current high-level programming languages. In this paper we describe a new programming language with matrix manipulation operators.

The second version describes the context of the paper's contribution.

Beginning a paper by stating that a topic is popular or that a problem is important is flat and uninspiring.

✗ Use of digital libraries is increasingly common.

✗ It is important that the cost of disk accesses be reduced in query processing.

Such openings succeed in establishing context but fail in motivation, often because they are an assertion that a reasonable person might disagree with. A simpler or more specific statement may well be preferable.

✓ Digital libraries provide fast access to large numbers of documents.

✓ Query processing can involve many disk accesses.

A typical organization for the introduction of a paper is to use the first paragraphs to describe the context. It is these paragraphs that convince the reader that the paper is likely to be interesting. The opening sentences should clearly indicate the topic.

✗ Underutilization of main memory impairs the performance of operating systems.

✓ Operating systems are traditionally designed to use the least possible amount of main memory, but such design impairs their performance.

The second version is better for several reasons. It is clear; it states the context, which can be paraphrased as *operating systems don't use much memory*; and, in contrast to the first version, it is positive.

Take care to distinguish description of existing knowledge from the description of the paper's contribution.

✗ Many user interfaces are confusing and poorly arranged. Interfaces are superior if developed according to rigorous principles.

✓ Many user interfaces are confusing and poorly arranged. We demonstrate that interfaces are superior if developed according to rigorous principles.

In most papers, the introduction should not flow on from the abstract, which is a summary of a paper rather than its opening. The paper should be complete even with the abstract removed.

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گوناگونی

Variation

Diversity—in organization, structure, length of sentences and paragraphs, and word choice—helps to keep the reader's attention.

✗ The system of rational numbers is incomplete. This was discovered 2000 years ago by the Greeks. The problem arises in squares with sides of unit length. The length of the diagonals of these squares is irrational. This discovery was a serious blow to the Greek mathematicians.

✓ The Greeks discovered 2000 years ago that the system of rational numbers is incomplete. The problem is that some quantities, such as the length of the diagonal of a square with unit sides, are irrational. This discovery was a serious blow to the Greek mathematicians.

Note how, in the second version, the final statement is more effective although it hasn't been changed.

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پاراگراف بندی

Paragraphing

A paragraph should discuss a single topic or issue. The outline or the argument is typically captured in the first sentence of each paragraph, with the rest of the paragraph used for amplification or example. Every sentence in a paragraph should be on the topic announced in the opening. The last sentence has higher impact than those in the body, so pay attention to sentence order.

Long paragraphs can indicate that several lines of argument are being followed simultaneously. If a long paragraph can be broken, break it. Lack of variation in paragraph length makes the page monotonous, however, so don't divide your text into paragraphs of uniform size.

Contextual information can be forgotten between paragraphs, and references between paragraphs can be difficult to follow. For example, if a paragraph discusses a fast sorting algorithm, the next paragraph should not begin "This algorithm" but rather "The fast sorting algorithm"; if one paragraph refers to Harvey, the next should not refer to "his" but rather to "Harvey's". Link paragraphs by re-use of key words or phrases, and with expressions that connect the content of one paragraph to that of the next.

Formatted lists can be used as an occasional alternative to paragraphs. Lists are useful for the following reasons:

- They highlight each main point clearly.
- The context remains obvious, whereas, in a long list of points made in a paragraph, it is hard to tell whether the later points are part of the original issue or belong to some subsequent discussion.
- An individual point can be considered in detail without confusing the main thread of narrative.
- They are easy to refer to.

List points can be numbered, named, or tagged. Use numbers only when ordering or reference is important. If it is necessary to refer to an individual point, use numbers or names. Otherwise use tags, as in the list above. Acceptable tags are bullets and dashes; fancy symbols such as $\hookrightarrow$, $\star$, or graphic icons look childish.

A disadvantage of lists is that they highlight rather too well: a list of trivia can be more attention-getting than a paragraph of crucial information. Reserve lists for material that is both significant and in need of enumeration.

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ابهام

Ambiguity

Check carefully for ambiguity. It is often hard to detect in your own text because you know what is intended.[1]

✗ The compiler did not accept the program because it contained errors.

✓ The program did not compile because it contained errors.

The next example is from a manual.

✗ There is a new version of the operating system, so when using the "fetch" utility, error messages can be ignored.

✓ There is a new version of the operating system, so the "fetch" utility's error messages can be ignored.

Part of the confusion comes from the redundant phrase "when using": there would be no error messages if the utility was not being used.

When using pronouns such as “it”, “this”, and “they”, ensure that the reader knows what is being referred to.

✗ The next stage was the test of the complete system, but it failed.

What failed, the test or the system?

✗ In addition to skiplists we have tried trees. They are superior because they are slow in some circumstances but have lower asymptotic cost.

✓ In addition to skiplists we have tried trees. Skiplists are superior because, although slow in some circumstances, they have lower asymptotic cost.

Another problem with “it” is that it is overused.

✗ The machine crashed and it was necessary to reboot it.

✓ The machine crashed and had to be rebooted.

The first sentence is not ambiguous, but “it” has been used in two senses. Use a more specific term whenever doing so doesn’t make the text too clumsy.

Premature pronouns also lead to difficulties.

✗ When it was first developed, recursive compilation was impractically slow and required too much memory.

✓ When recursive compilation was first developed, it was impractically slow and required too much memory.

A common source of confusion is between speed and time. Although not ambiguous, the phrase "increasing speed" is easily read as *increasing time*, which has the opposite meaning. There are similar problems with phrases such as "improving affordability".

A clumsy sentence is preferable to an ambiguous one. But remember that stilted sentences slow the reader, and it is difficult to entirely avoid ambiguity.[2]

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ساختار جمله

Sentence Structure

Sentences should have simple structure, which usually means that they will be no more than a line or two. Don't say too much all at once.[3]

Watch out for fractured "if" expressions.

✗ If the machine is lightly loaded, then response time is acceptable whenever the data is on local disks.

✓ If the machine is lightly loaded and data is on local disks, then response time is acceptable.

✓ Response time is acceptable when the machine is lightly loaded and data is on local disks.

The first version is poor because the conditions of the "if" have been separated by the consequent.

Beware of misplaced modifiers.

✗ We collated the responses from the users, which were usually short, into the following table.

✓ The users' responses, most of which were short, were collated into the following table.

Double negatives can be difficult to parse and are ambiguous.

✗ There do not seem to be any reasons not to adopt the new approach.

The impression here is of condemnation—*we don't like the new approach but we're not sure why*—but praise was intended; the quote is from a paper advocating the new approach. This is another example of the academic tendency to overqualify. The revision "There is no reason not to adopt the new approach" is punchier, but still negative. It is difficult to suggest further improvement with the same meaning, because the meaning was probably unintended, but the following better reflects the original aims.

Organize your sentences so that they can be parsed without too much backtracking. Ambiguous words or phraseology, even if clear in the context of a whole sentence, can slow the reader down.

✗ Classifying handles can involve opening the files they represent.

The opening phrase can, without the context provided by the rest of the sentence, be interpreted as *handles for classifying*.

✓ Classification of handles can involve opening the files they represent.

This is an instance of a more general problem. If an "-ing" suffix can be replaced by "-ation of", as in this example, then it is probably a good idea to do so. Other similar examples are as follows.

✗ The final line in the table shows that removing features with low amplitude can dramatically reduce costs.

✓ The final line in the table shows that removal of features with low amplitude can dramatically reduce costs.

✗ In this context, developing tools is not an option.

✓ In this context, development of tools is not an option.

In the first example, the reader may briefly wonder what a "removing feature" is—the construct feels like a name, not an action.

Know your limits. Experienced writers can construct complex sentences that are easy to read, but don't make the mistake of believing that something is easy to understand because you—the author—understand it.

Build your text from simple sentences and concise paragraphs. To guide analysis of your writing, ask elementary questions about it. Is each sentence motivated by the preceding text? Can you identify the sentence's purpose, that is, is it necessary? Could it be simplified? And so on. The habit of careful examination of your text can greatly improve your writing.

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زمان جملات

Tense

In science writing, most text is in past or present tense. Present tense is used for eternal truths. Thus we write "the algorithm has asymptotic cost $O(n)$", not "the algorithm had asymptotic cost $O(n)$". Present tense is also used for statements about the text itself. It is better to write "related issues are discussed below" than to write "related issues will be discussed below".

Past tense is used for describing work and outcomes. Thus we write "the ideas were tested by experiment", not "the ideas are tested by experiment". It follows that it is occasionally correct to use past and present tense together.

✓ Although theory suggests that the Klein algorithm has asymptotic asymptotic cost $O(n^2)$, in our experiments the trend observed was $O(n)$.

Either past or present tense can be used for discussion of references. Present tense is preferable but past tense can be forced by context.

✓ Willert (1999) shows that the space is open.

✓ Haast (1986) postulated that the space is bounded, but Willert (1999) has since shown that it is open.

Other than in conclusions, future tense is rarely used in science writing.

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تکرار و توازی

Repetition and Parallelism

Text that consists of the same form of sentence used again and again is monotonous. Watch out for sequences of sentences beginning with "however", "moreover", "therefore", "hence", "thus", "and", "but", "then", "so", "nevertheless", or "nonetheless". Likewise, don't overuse the pattern "First, … Second, … Last, …".

Complementary concepts should be explained as parallels, or the reader will have difficulty seeing how the concepts relate to each other.

✗ In SIMD, the same instructions are applied simultaneously to multiple data sets, whereas in MIMD different data sets are processed with different instructions.

✓ In SIMD, multiple data sets are processed simultaneously by the same instructions, whereas in MIMD multiple data sets are processed simultaneously by different instructions.

Parallels can be based on antonyms.

✗ Access is fast, but at the expense of slow update.

✓ Access is fast, but update is slow.

Lack of parallel structure can result in ambiguity.

✗ The performance gains are the result of tuning the low-level code used for data access and improved interface design.

✓ The performance gains are the result of tuning the low-level code used for data access and of improved interface design.

This can be further improved. It is kinder to the reader to move the longer clauses in a list to the end.

✓ The performance gains are the result of improved interface design and of tuning the low-level code used for data access.

There are some standard forms of parallel. The phrase "on the one hand" should have a matching "on the other hand". A sentence beginning "One …" suggests that a sentence beginning "Another …" is imminent. If you flag a point with "First" then every following point should have a similar flag, such as "Second", "Next", or "Last".

Parallel structures should be used in lists.

✗ For real-time response there should be sufficient memory, parallel disk arrays should be used, and fast processors.

The syntax can be fixed by adding "should be used" at the end but the result is clumsy. A complete revision is preferable.

✓ Real-time response requires sufficient memory, parallel disk arrays, and fast processors.

Note the use in this example of the serial comma, as discussed further in Chap. 8.

Comparisons and relative statements should be complete. If "the Entity-Relationship model is a better method for developing schema", then it is better than something else. Say what that something is.

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تأکید

Emphasis

The structure of a sentence places implicit emphasis, or stress, on some words. Reorganization of a sentence can change the emphasis.

✗ A static model is appropriate because each item is written once and read often.

It is not clear what makes the model's behaviour appropriate; the emphasis should be on the last two words, not the last five.

✓ A static model is appropriate because each item is only written once but is read often.

Inappropriate stress can lead to ambiguity.

✗ Additional memory can lead to faster response, but user surveys have indicated that it is not required.

✓ Faster response is possible with additional memory, but user surveys have indicated that it is not required.

The first version, which has the stress on “additional memory”, incorrectly implies that users had commented on memory rather than response. Since the sentence is about “response”, that is where the stress should be.

Explicit stress can be provided with italics, but is almost never necessary. Don't italicize words *unnecessarily*—let sentence structure provide the emphasis. Few papers require explicit stress more than once or twice. DON'T use capitals for emphasis. Some authors use the word "emphatic" to provide emphasis, as in "which are emphatically not equivalent". Other words used in this way are "certainly" and "indeed". The resulting wordiness weakens rather than strengthens; use of this form of emphasis should be rare.

Italicized passages of any length are hard to read. Rather than italicize a whole sentence, say, stress it in some other way: italicize one or two words only, or make it the opening sentence of a paragraph.

When a key word is used for the first time, consider placing it in italics.

✓ The data structure has two components, a *vocabulary* containing all of the distinct words and, for each word, a *hit list* of references.

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تعریف‌ها

Definitions

Terminology, variables, abbreviations, and acronyms should be defined or explained the first time they are used. Definitions should be specific and concrete. Don't create questions by giving definitions that refer to concepts that are unknown or uncertain.

Use a consistent format for introducing new terminology. Implicit or explicit emphasis on the first occurrence of a new word is often helpful, because it stresses what is being introduced.

✗ We use homogeneous sets to represent these events.

The reader has not been told that "homogeneous" is a new term that is about to be defined, and may look back for an explanation.

✓ We use *homogeneous* sets to represent these events.

✓ To represent these events we use homogeneous sets, whose members are all of the same type.

It can be helpful to give multiple explanations or illustrations of unfamiliar concepts.

✓ Compaction, in contrast to compression, does not preserve information; that is, compacted data cannot be exactly restored to the original form.

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انتخاب واژگان

Choice of Words

Use short, direct words rather than long, circumlocutionary ones; the result is vigorous, emphatic writing. For example, use "begin" rather than "initiate", "first" and "second" rather than "firstly" and "secondly", "part" rather than "component", and "use" rather than "utilize". Use short words in preference to long, but use an exact long word rather than an approximate short one.

The words you choose should be specific and familiar. Abstract, vague, or broad terms have different meanings for different readers and can lead to confusion.

✗ The analysis derives information about software.

The "information" could be anything: optimizations, function-point descriptions, bug reports, or asymptotic cost.

✓ The analysis estimates the resource costs of software.

Other abstract terms that are overused include "important", "intelligent", "method", "paradigm", "performance", and "semantic". "Difficult" is often used when a better term is available: if something is "difficult to compute", does that mean that it is slow, or memory-hungry, or requires double precision, or something else altogether? "Hard" is sometimes used poorly too, including cases when "difficult" would be a better choice; remember that "hard" also means *inflexible* or *rigid* and can be misunderstood. "Efficient" is another word that is often vague. Use the most precise term available.

A common reason for using vague terms is that some authors feel they are writing badly if they use the same word twice in a sentence or paragraph, and thus substitute a synonym, which is usually less specific.

✗ The database executes on a remote machine to provide better security for the system and insulation from network difficulties.

✓ The database executes on a remote machine to provide better security for the database and insulation from network difficulties.

The "don't repeat words" rule might apply to creative writing, but not to technical terms that must be clearly understood.

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توصیف‌گرها

Qualifiers

Don't pile qualifiers on top of one another. Within a sentence, use at most one qualifier such as "might", "may", "perhaps", "possibly", "likely", "likelihood", or "could". Overuse of qualifiers results in text that is lame and timid.

✗ It is perhaps possible that the algorithm might fail on unusual input.

✓ The algorithm might fail on unusual input.

✓ It is possible that the algorithm would fail on unusual input.

Here is another example, from the conclusions of a paper.

✗ We are planning to consider possible options for extending our results.

✓ We are considering how to extend our results.

Double negatives are a form of qualifier; they are commonly used to express uncertainty.

✗ Merten's algorithm is not dissimilar to ours.

Such statements tell the reader little.

Qualifiers such as “very” and “quite” should be avoided, because they are in effect meaningless. If an algorithm is “very fast”, is an algorithm that is merely “fast” deficient in some way? Writing is invariably more forceful without “very”.

✗ There is very little advantage to the networked approach.

✓ There is little advantage to the networked approach.

Likewise, “simply” can often be deleted.

✗ The standard method is simply too slow.

✓ The standard method is too slow.

Other words of this kind are “totally”, “completely”, “truly”, “highly”, “usually”, “accordingly”, “certainly”, “necessarily”, and “somewhat”.

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کاربرد نادرست واژگان

Misused Words

The Table 7.1 lists words that are often used incorrectly because of confusion with another word of similar form or sound. The "usually correct" form is shown on the left; the form with which each word gets confused is shown on the right. Some other problem words are as follows.

Which, that, the. Many writers use "which" when "that" is appropriate. Use "which" only when it cannot be replaced by "that".

✗ There is one method which is acceptable.

✓ There is one method that is acceptable.

✓ There are three options, of which only one is tractable.

The word "that" is often underused. Use of "that" can make a sentence seem stilted, but its absence can make the sentence unclear.

✗ It is true the result is hard to generalize.

✓ It is true that the result is hard to generalize.

On the other hand, "the" is often used unnecessarily; delete it where doing so does not change the meaning.

Less, fewer. Use "less" for continuous quantities ("it used less space") and "fewer" for discrete quantities ("there were fewer errors").

Table 7.1 Misused words

Usual	Other
Alternative	Alternate
Coarse	Course
Comparable	Comparative
Complement	Compliment
Dependent	Dependant
Descendant	Descendent
Discrete	Discreet
Elusive	Illusive
Emit	Omit
Ensure	Insure
Ensure	Assure
Envelope	Envelop
Excerpt	Exert
Foregoing	Forgoing
Further	Farther
Insight	Incite
Lose	Loose
Omit	Emit
Partly	Partially
Practice	Practise
Principle	Principal
Simple	Simplistic
Solvable	Soluble
Stationary	Stationery

Affect, effect. The "effect", or *consequence*, of an action is to "affect", or *influence*, outcomes.

Alternate, alternative, choice. The word "alternate" means *other* or *switch between*, whereas an "alternative" is something that can be chosen. Strictly speaking, if there is only one alternative, no choice is available; "alternative" and "choice" are not synonyms.

Assume, presume. "Assume" means *for now, take as being true*, while "presume" means *take for granted*. A fact is assumed as the basis of an argument, an event is presumed to have occurred.

May, might, can. Many writers use "may" or "might" when they mean "can". Use "may" to indicate personal choice, and "can" to indicate capability.

✓ Users can access this facility, but may not wish to do so.

Basic, fundamental. Some writers confuse "basic" with "fundamental": the former means *elementary* as well as *a foundation*. A result should only be described as "basic" if *elementary* is meant, or readers may get the wrong idea.

Novel, complex, sophisticated. "Sophisticated" does not mean *new* or *novel*, but either *advanced* or *complex*. Use "novel" or "complex" if these meanings are intended.

Will, shall. The word "shall" can seem archaic and is rarely preferable to "will". Both "will" and "shall" are often used unnecessarily and in many cases can be deleted.

Compile, compose. In general usage, "compile" means *assemble*, *gather*, or *collect*, but it has such a strong specific meaning in computing that it should not be used for other purposes. To "compose" is to *invent* or perhaps *prepare*; it is not a synonym of "compile", even though "composed of" means *made up of*.

Conflate, merge, confuse. The word "conflate" means *regard distinct things as similar*, while "merge" means *join distinct things to form one new thing*. If two things are "confused", then one has been mistaken for the other. These three terms are not equivalent.

Continual, continuous. "Continual" is not equivalent to "continuous". The former means *ceaselessly*; the latter means *unbroken*.

Conversely, inversely, similarly, likewise. Only use "conversely" if the statement that follows really is the opposite of the preceding material. Don't use "similarly" or "likewise" unless whatever follows has a strong parallel to the preceding material. Some authors use "inversely", but the meaning is rarely clear; avoid it.

Fast, quickly, presently, timely, currently. A process is "fast" if it *runs quickly*; "quickly" means *fast*, but does not necessarily mean *in the near future*. Something is "timely" if it is *opportune*; timeliness has nothing to do with rapidity. Also on the subject of time, "presently" means *soon*, whereas "currently" means *at present*.

Optimize, minimize, maximize. Absolute terms are often misused. One such word is "optimize", which means *find an optimum* or *find the best solution*, but is often used to mean *improve*. The latter usage is now so common that it could be argued that the meaning of "optimize" has changed, but as there is no synonym for "optimize" such a change would be unfortunate. Other absolute terms that are misused are "maximize" and "minimize".

Overlook, oversee, oversight. To "overlook" is to fail to notice, or to *ignore*. To "oversee" is to *manage* or look after. They are not synonyms! Even more confusingly, "oversight" means both of these things.[4]

Theory, hypothesis, proposition, supposition. These words are used in a wide variety of ways across the discipline. In some areas, "theory" is used in a strict sense, of a *hypothesis* that has been confirmed by analysis or experiment. But in some areas it is used more or less equivalently to "proposition", in the sense of *a concept that is to be tested*. Sometimes "proposition" is used to mean *assumption*, as is "supposition". That is, these terms are used both formally and loosely, in ways that can be deeply inconsistent with each other. As in other cases, be alert to the conventions within your discipline, but it is helpful to use these terms in ways that are consistent with their formal meaning, as they are part of the fundamental principles of science.

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قراردادهای املائی

Spelling Conventions

A finished manuscript should as nearly as possible be free of spelling errors. As is also true for serious grammatical errors and poor formatting, the presence of spelling errors signals to the reader—perhaps subconsciously—that the work is unreliable and has been undertaken in a lazy way.

To ensure that all errors have been found it is essential to use a spell checker, but you should also take the effort to find mistakes by hand. It has been claimed that writers who depend solely on spell checkers tend to have more errors in their work than writers who don't use spell checkers at all, perhaps because the discipline of detailed examination means that the work is more carefully scrutinized overall.

Some words don't have a single fixed spelling. An example is "disk"; both this spelling and "disc" are so common that either is acceptable, but be consistent. However, "hard disk" is more common than "hard disc", and "compact disk" is incorrect. Other words that don't have a stable spelling include "enquire" ("inquire"), "biased" ("biassed"), and "dispatch" ("despatch"). In these examples, while one or the other spelling is more common in different cultures, both are in wide use.

The English-speaking countries have different spelling conventions. For example, the American "traveler" becomes the British "traveller" while "fulfill" becomes "fulfil". In Britain it is incorrect to spell "-our" words as "-or", but, for example, "vigour" and "vigorous" are both correct.[5] The American "center" is the British "centre", "program" is "programme" (except for *computer program*), "catalog" and "analog" are "catalogue" and "analogue", "acknowledgment" is "acknowledgement", and "judgment" is "judgement". Another confusion is with regard to the suffixes "-ize" and "-yze", which have the same recommended spelling in both countries, but are often spelt as "-ise" and "-yse" outside the United States.[6] As discussed in Chap. 1, British spelling has largely been used throughout this book.

Science is international—technical writing is usually for a readership that is accustomed to reading text from around the world—and it is accepted that a national of one country won't necessarily use the spelling of another. The most important thing is to spell consistently and to be consistent with suffixes such as "-ize" without introducing errors such as "expertize" or "otherwize". Note that many journals insist on their own standards for spelling and presentation, or insist that the spelling be consistently of one nationality or another, and thus may choose to modify anything they publish.

روش پژوهش و ارائه

اصول خاص سبک نگارش

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زبان حرفه‌ای

Jargon

The word "jargon" means *terms used in a specialized vocabulary* or *mode of speech familiar only to a group or profession*.[7] As such, the use of jargon is an important part of scientific communication—how convenient it is to be able to say "CPU" rather than "the part of the computer that executes instructions". Some use of technical language, which inevitably makes the writing inaccessible to a wider readership, is essential for communication with specialists. But the more technical the language in a paper, the smaller the audience will be.

In mathematical writing, formal notation is a commonly used jargon. Mathematics is often unavoidable, but that doesn't mean that it must be impenetrable.

✕ **Theorem.** Let $\delta_1, \ldots, \delta_n$, $n > 2$ be such that $\delta_1 \mapsto_{\Omega_1} \delta_2, \ldots, \delta_{n-1} \mapsto_{\Omega_{n-1}} \delta_n$. Let $\eta', \eta'' \in \mathscr{R}$ be such that $\Omega_1 \models \eta'$ and $\Omega_{n-1} \models \eta''$. Then

$$\exists(\eta', \eta_1)(\eta_1, \eta_2) \cdots (\eta_{r-1}, \eta_r)(\eta_r, \eta'') \in L$$

such that $\forall \eta_i$, $1 \leq i \leq r$, $\exists \Omega_j$, $1 \leq j < n$, such that $\Omega_j \models \eta_i$.

Mathematics as jargon is discussed further in Chap. 9.

Jargon does not have to consist of obscure terms. It can be at its most confusing when words in common use are given a new meaning; and some words have multiple meanings even within computing.

✗ The transaction log is a record of changes to the database.

✓ The transaction log is a history of changes to the database.

The first version is confusing because databases consist of records. Likewise, consider "the program's function". Synonyms also cause such problems.

✗ Hughes describes an array of algorithms for list processing.

✓ Hughes describes several algorithms for list processing.

New jargon inevitably arises during research, as ideas are debated and simple labels are attached to new concepts. Consider whether your terminology conveys the intended meaning (or any meaning at all) to likely readers.

The need to name variants of existing ideas or systems presents a dilemma, because if the new name is dissimilar to the old then the relationship is not obvious, but prefixing a modifier to the old name—for example, to obtain "binary tree" from "tree"—can result in ridiculous constructs such as the "variable-length bitstring multiple-descriptor floating bucket extensible hashing scheme". If you need to qualify a name, choose a meaningful adjective. There are already too many "intelligent" algorithms, for example.

Where new terminology or jargon is introduced, use it consistently. Existing terminology or notation should only be changed with good reason. Sometimes your problem requires new terminology that is inconsistent with the terminology already being used, thus making change essential; but remember that any change is likely to make your paper harder to read.

روش پژوهش و ارائه

اصول خاص سبک نگارش

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کلیشه
و
اصطلاح

Cliché and Idiom

Some expressions are clichés, that is, stock phrases whose meaning has little relationship to their words. Many readers, especially those from other cultures, may misunderstand such phrases. Examples include “follow suit”, “up to scratch”, “reinvent the wheel”, “go through with a fine-tooth comb”, “flat out”, “cut and dried”, and “bells and whistles”. Idiomatic phrases are also poor choices in scientific writing, for similar reasons. Examples include “crop up”, “lose track”, “come to grips with”, “it turned out that”, “play up”, “stacked deck”, and “right out”. Do not use such phrases.

روش پژوهش و ارائه

اصول خاص سبک نگارش

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واژگان بیگانه

Foreign Words

If you use a foreign word that you feel needs to go in italics, consider instead using an English equivalent. Some writers feel that use of foreign words is *de rigueur* because it lends the work a certain *je ne sais quoi* and shows *savoir-vivre*, but such writing is hard to understand.

Latin expressions are occasionally used—but more often misused—in technical writing. Examples include *mutatis mutandis*, *prima facie*, *circa*, *mea culpa*, and *vice versa*. Such phrases are not universally understood, and should only be used if you are confident of the meaning.

It is polite to use appropriate characters for foreign names, if they are natively written in a Latin character set. Don't write "Børstëdt" as "Borstedt", for example. But "张" may have to be written as "Zhang".

روش پژوهش و ارائه

اصول خاص سبک نگارش

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بیش‌استفاده از واژگان

Overuse of Words

Repetition of a word is annoying when it makes the reader feel they have read the same phrase twice, or have read a phrase and an inversion of it.

✗ Ada was used for this project because the underlying operating system is implemented in Ada.

✓ Ada was used for this project because it is the language used for implementation of the underlying operating system.

Repetition should be eliminated when the same word is used in different senses, or when a word and a synonym of it are used together.

✗ Values are stored in a set of accumulators, each initially set to zero.

✓ Values are stored in a set of accumulators, each initialized to zero.

روش پژوهش و ارائه

اصول خاص سبک نگارش

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عبارات اضافی

Padding

Padding is the unnecessary use of pedantic phrases such as "in general", which should usually be deleted, not least because they are irritating. The phrase "of course" can be patronizing or even insulting—"*of course* it is now clear that that the order is stable". The phrases "note that" and "the fact that" are not padding, but are often used to introduce something that readers should be able to deduce for themselves.

Phrases involving the word "case" ("in any case", "it is perhaps the case") are also suspect. There is rarely a reason to use "it is frequently the case that" instead of "often", for example. Unnecessary introduction of quantities, or the concept of quantities, is a form of padding. For example, the phrase "a number of" can be replaced by "several", and "a large number of" by "many".

Adjectives are another form of padding.

✗ A well-known method such as the venerable quicksort is a potential practical alternative in instances of this kind.

In all likelihood, the context has made clear that impractical alternatives are not being discussed.

✓ A method such as quicksort is a potential alternative.

Table 7.2 Examples of redundant or wordy expressions

Wordy	Concise
Adding together	Adding
After the end of	After
In the region of	Approximately
Cancel out	Cancel
Conflated together	Conflated
Let us now consider	Consider
Cooperate together	Cooperate
Currently … today	Currently …
Divided up	Divided
Give a description of	Describe
During the course of	During
Totally eliminated	Eliminated
Of fast speed	Fast
First of all	First
For the purpose of	For
Free up	Free
In view of the fact	Given
Joined up	Joined
Of large size	Large
Semantic meaning	Meaning
Merged together	Merged
The vast majority of	Most
It is frequently the case that	Often
Completely optimized	Optimized
Separate into partitions	Partition
At a fast rate	Quickly
Completely random	Random
Reason why	Reason
A number of	Several
Such as … etc.	Such as …
Completely unique	Unique
In the majority of cases	Usually
Whether or not	Whether
It is a fact that	—

روش پژوهش و ارائه

اصول خاص سبک نگارش

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صیغه جمع

Plurals

A common problem in English for writers educated in another language is agreement of plurals—a plural noun can require a differently formed verb to that required by a singular noun. For example, “a parser checks syntax” whereas “compilers check programs”. Simple errors such as “the instructions is” are easy to identify, but care needs to be taken with complex sentence constructions. A particular problem is with collectives.

✗ The set of positive matches are then discarded.

✓ The set of positive matches is then discarded.

✗ The range of numbers that must be considered are easy to identify.

✓ The range of numbers that must be considered is easy to identify.

Consider proofreading your paper just to check for plural agreement.

When describing classes of things, excessive use of plurals can be confusing. The following is from a paper on minimum redundancy codes.

✗ Packets that contain an error are automatically corrected.

✗ Packets that contain errors are automatically corrected.

The first version implies that packets with a particular error are corrected, the second that packets with multiple errors are corrected. Both of these interpretations are wrong. Whenever it is reasonable to do so, convert plurals to singular.

✓ A packet that contains an error is automatically corrected.

Classes may not need a plural.

✗ These kinds of algorithms are irrelevant.

✓ These kinds of algorithm are irrelevant.

✓ Algorithms of this kind are irrelevant.

The use of variant plurals is becoming less common. Where once it was thought correct to base the plural form on that of the language of the root of the word, now it is almost always acceptable to use "-s" or "-es". Thus "schemata" can be "schemas", "formulae" can be "formulas", and "indices" can be "indexes"; but, while "indices" is used in the context of arrays, it is almost never used in the context of databases. However, "radii" is not yet "radiuses", and "matrices" is not yet "matrixes". Special cases remain, in particular where the plural form has replaced the singular as in "data", and in old-English forms such as "children".

روش پژوهش و ارائه

اصول خاص سبک نگارش

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کوته‌نوشت‌ها
(مخفف‌ها)

Abbreviations

It is often tempting to use abbreviations such as "no.", "i.e.", "e.g.", "c.f.", and "w.r.t." These save a little space on the page, but slow readers down. It is almost always desirable to expand these abbreviations, to "number", "that is", "for example", "compared with" (or more accurately "in contrast to", since that is the sense in which "c.f." should be used), and "with respect to", or synonyms of these expressions. Where such abbreviations are used, the punctuation should be as if the expanded form were used. Also consider expanding abbreviations such as "Fig." and "Alg." (but note that the contracted form is the preferred style for some journals), and don't use concoctions such as "1st" or "2nd". Months should not be abbreviated. Make sure that all abbreviations and acronyms are explained when they are first used.

Avoid use of "etc." and "and so on". They are clumsy, and sometimes patronizing, as they can imply that the reader ought to be able to complete the list without the author's help.

✗ Methods available are random probing, extrapolation, etc.

✓ Methods available include random probing and extrapolation.

✓ Methods such as random probing and extrapolation can be used.

Never write "etc., etc." or "etc. …".

روش پژوهش و ارائه

اصول خاص سبک نگارش

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سرنام‌ها

Acronyms

In technical documents with many compound terms it can be helpful to use acronyms, but as with abbreviations they can confuse the reader. An acronym is desirable if it replaces an otherwise indigestible name such as "pneumonoultramicroscopicsilicovolcanoconiosis" (miner's black lung disease), in which case the acronym becomes the name—as has happened with DNA for "deoxyribonucleic acid". Frequently used sequences of ordinary words, such as "central processing unit", are usually more convenient as acronyms; in a paper about a "dynamic multiprocessing operating system", it is probably best to introduce the DMOS right at the start. However, a surfeit of acronyms will force readers to flip back and forth through the paper to search for definitions. Don't introduce an acronym unless it is to be used frequently.

Acronyms can be fashionable. It was once common to write "WWW" to denote the World Wide Web, but today it is usually denoted by "the Web" or "the web"—often, it isn't even capitalized. And watch out for redundant acronyms, such as "the CPU unit". How, exactly, does a "local area LAN network" differ from a "LAN"?

Abbreviations end with a stop but it is unusual to put stops in acronyms. Thus "CPU" is correct, "C.P.U." is acceptable, and "CPU." is incorrect. Plurals of acronyms don't require an apostrophe; write "CPUs" rather than "CPU's".

روش پژوهش و ارائه

اصول خاص سبک نگارش

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جنسیت

Sexism

Forms of expression that unnecessarily specify gender are widely regarded as sexist. In technical writing, sexist usage is easy to avoid.

✗ A user may be disconnected when he makes a mistake.

✓ A user may be disconnected when they make a mistake.

✓ Users may be disconnected when they make a mistake.

The first use of "they", as a singular pronoun, is acceptable but, to some readers, jarring. The second use, as a plural, removes sexism at the cost of clarity. It is preferable to recast the sentence.

✓ A user who makes a mistake may be disconnected.

Don't use ugly constructs such as "s/he" or engage in reverse sexism by using "she" unless it is absolutely impossible to avoid a generic reference. Remember that some readers find use of "he" or "his" for a generic case offensive and dislike writing that employs such usage.

روش پژوهش و ارائه

اصول خاص سبک نگارش

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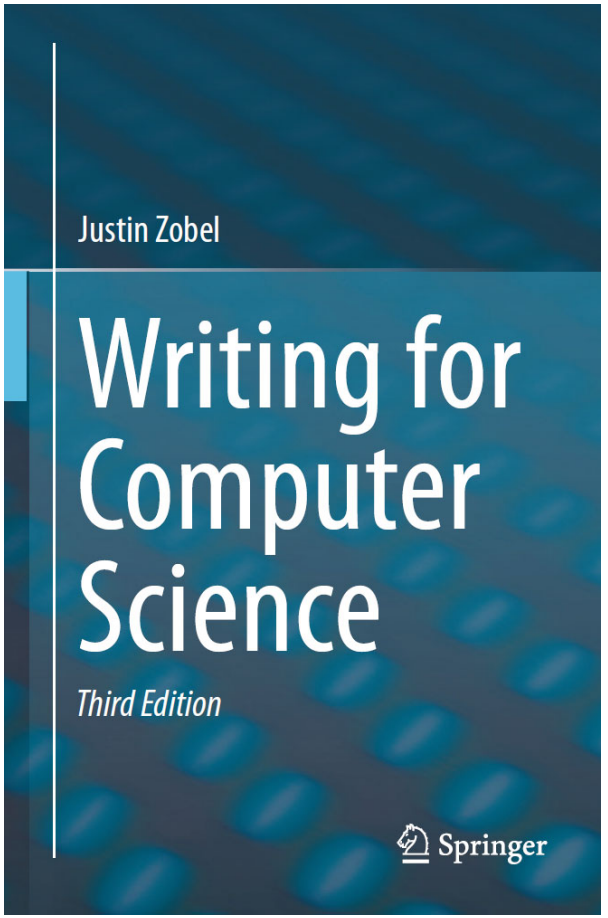
منابع

کتاب درس

نگارش برای علم کامپیوتر



Justin Zobel,
Writing for Computer Science,
3rd Edition, Springer, 2015.