



STUDENT MANUAL
(Remote Version)

Technical Writing Fundamentals Intermediate Level

Information Processing Society of Japan
Kansai Branch
September 17, 2023

Technical Writing Fundamentals – Intermediate (Remote Version)
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3. Use (but don’t depend on) your computer’s spell-checking function
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About the Seminar's Presenter

Ron Read is a vice president and Osaka branch manager of Human Global Communications Co., Ltd., previously Kurdyla and Associates Co., Ltd., a communications consulting firm established in Japan in 1969. He holds a bachelor's degree in Journalism from the University of Oregon, and before coming to Japan in 1986 worked as a radio news reporter-producer and a newspaper editor. His current duties include training and supervising



technical rewriters and presentation trainers. His work also involves rewriting of technical papers, corporate communications, and academic books, as well as giving personal and group presentation training to researchers and executives. He has given seminars and classes at Kyoto University, Osaka University of Arts, Panasonic Corp., and the Osaka Chamber of Commerce and Industry, where he is a long-time member. He has collaborated with Institute of Electronics, Information and Communication Engineers (IEICE), Information Processing Society of Japan (IPSJ), Japan Society of English for Research (J-SER), and Keihanna Venture Championship (KVeCS). He serves as secretary of the Kinki Macintosh Users Group. He writes a quarterly column on technical writing, "Author's Toolkit," for IEICE Information and Systems Society Journal (download copies for personal use at <http://hgckansai.com/downloads/>).

Post-course Review Package

A few days after the course, you will receive a PDF file that contains the full-text version of the main lecture (including the examples used in the PowerPoint presentation), answers to exercises, revisions of analyzed abstract, etc. Please review this information to reinforce the points you learned in the online seminar. It will also contain info on a special offer to IPSJ participants: A 20% discount on your *first* order of our rewriting services!

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Information Processing Society of Japan
Kansai Branch
Technical Writing Fundamentals – Intermediate
(REMOTE TRAINING PROGRAM*)
September 17, 2023

Schedule	
9:30–9:35	Orientation <ul style="list-style-type: none"> - Self-introductions - Purpose and Goals - Activities
9:35–10:35	Lecture/Presentation <i>(abbreviated for online version)</i> <ul style="list-style-type: none"> - General Advice for Better Technical Writing - Good Practices - Introduction to Self-study: Impact Writing and Verb Power
10:35–11:30	Introduction to “IMRAD” System <i>(correction of pre-class self-study)</i> <ul style="list-style-type: none"> - Brief Overview - <i>Abstract Writing</i> Exercise & Analysis
11:30–12:00	Writing Style Points: Principles and Exercises <i>(correction of pre-class self-study)</i> <ul style="list-style-type: none"> - Introduction to “Parallelism Concept” in Writing - Changing Abstract Nouns into Action Verbs
12:00–12:45	Lunch
12:45–13:00	Writing Style Points: Principles and Exercises <i>(continued)</i> <ul style="list-style-type: none"> - Changing Abstract Nouns into Action Verbs
13:00–14:10	Common Problems in Technical Writing: Flashcard Drill <i>(abbreviated for online version)</i> <ul style="list-style-type: none"> - Typical formatting problems - Prepositions, unneeded words, word choice - Word order, logic, style, paper preparation
14:10–15:15	Writing Clinic <i>(from submitted pre-class assignments)</i> <ul style="list-style-type: none"> - Sample Analysis: Individual and Team Work - Correction and Explanation by Classmates/Instructor - Finalized “In-Class Worksheet” sent to students <i>after course</i>
	Wrap-up

In reviewing this student manual **before the online seminar, please give extra attention to the instructions in red font.*

General Tips on Tech Writing

[Please read over the following points before the class day. A full version of the lecture's text, including the examples used, is included in the Post-course Review Package.]

I. General Advice for Better Technical Writing

1. Keep your sentences short! In general, under 25 words (confusion is proportional to sentence length)
2. Favor the *active voice* to the *passive voice*, mix these usages (“we” is not so bad if used in moderation)
3. Keep the main verb early (don’t bury *the action* under a ton of noun phrases)
4. Be careful to connect different ideas clearly (readers should be able to make connections with ease)
5. Use prepositions accurately (they can give similar expressions radically different meanings)
6. Avoid expressions that are too *tentative* (these often lack logic and sound indecisive or weak)
7. Learn to recognize and avoid *mombusho*-type universal errors (there’s no reason to keep bad habits)
8. Avoid overuse of “embedded” expressions in the middle of sentences (long interruptions of the main idea can hurt readability)
9. Do not waste the *power* of paragraphs (good paragraphing significantly helps your reader get your ideas)
10. Use a neutral, professional, calm *tone* in your technical writing (don’t make your expressions overly formal or overly casual)

II. Good Practices

1. Proofread everything you write!
2. Get input from your colleagues, senior researchers, etc.
3. Plan your entire document before starting to draft it
4. Writing is time-consuming! Allocate enough time, and then add a “safety margin”
5. Use (*but don’t depend on*) your computer’s spell-checker (it can be fooled)
6. Keep a flexible attitude—revision is *nearly* always a good thing!

Impact Writing & Verb Power

The following sentences are perfectly grammatical and understandable but could be easily improved, mainly by more effective verb use. Change the wording slightly, but not the general meaning, to give these sentences *more impact*. **This exercise is only for self-study; it is not covered in the online seminar.**

Suggested revisions can be found at:

www.tensaku.org/wrtest1/click.html

1. If we don't take action right away, we'll lose the contract.
2. I hope you don't mind if we make changes to the wording.
3. I can't give a response to their demands until you give me an answer.
4. Let's get their opinion before we make a decision.
5. Our only choice is a reduction in the price.
6. I need your input for the completion of the report.
7. The elimination of this requirement will save us a lot of time.
8. There will be a chance to sound him out at the reception.
9. It is possible that the exchange rate will move in our direction.
10. It is typical for demand to fall in such cases.

Organization of Academic Papers



[Please review the following points **before** the online seminar]

An academic paper contains *three major parts* (3):

- The *front material* consists of the cover, title page, and abstract.
- The *back material* consists of the acknowledgments, references, appendices, glossary, and personal histories.
- In this course we will focus on the *body*. The *body* may contain several, **but not all**, of the following:

Introduction

Materials and Methods

Results

Experimental (Methods + Results)

Discussion

Conclusions

Restatement of Results

Concluding Remarks

Recommendations

Summary

Your first step is to decide how to *organize your paper*. Begin by checking the *Instructions to Authors* for the journal you are writing for to see what their requirements are. Read this information very carefully.

The way you organize your paper is important because so much information is reported that readers and editors demand a system that is *uniform, concise, and readily understandable*.

One standard structure is the *IMRAD format*. The value of this approach was recognized about 100 years ago, when scientists found it necessary to describe their work in detail so that others could understand it and independently verify it.

Logic of IMRAD (2):

<i>Introduction:</i>	What problem was addressed?
<i>Materials and Methods:</i>	How was it studied?
<i>Results (and):</i>	What were the findings?
<i>Discussion:</i>	What do they mean?

Although it was designed for *basic research papers*, with minor variations it can be applied to other types of papers, including application descriptions, review papers, theoretical papers, and mathematical proofs. For example, a *device application paper* might be organized as *Introduction* ➤ *Description* ➤ *Characteristic* ➤ *Discussion*.

A *system development paper* might be organized as *Introduction* ➤ *Description* ➤ *Performance* ➤ *Discussion*.

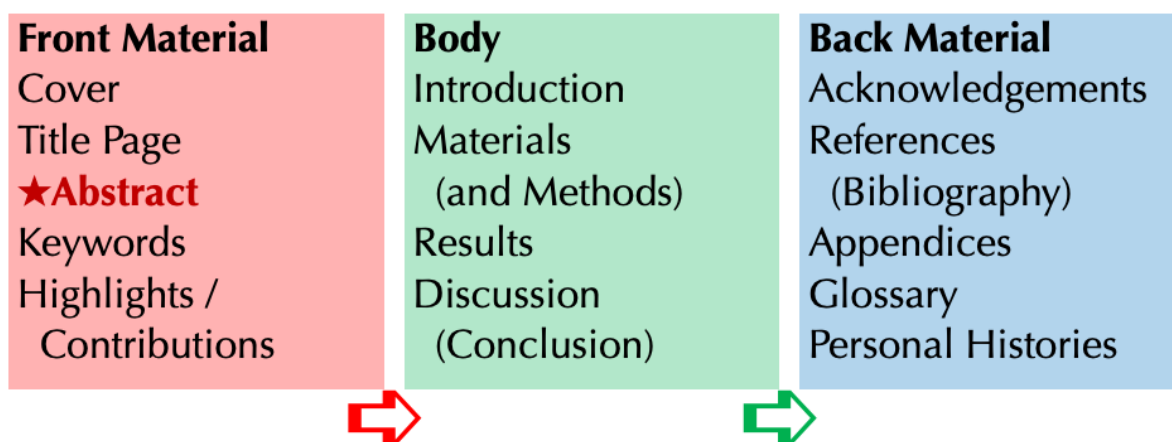
A paper in *history, economics, geography or the social sciences* might be organized as

<i>Introduction</i>
<i>Theme 1 (e.g. “economics of Russian villages in 18th century”)</i>
<i>Theme 2 (e.g. “economics of Japanese villages in 18th century”)</i>
<i>Theme 3 (e.g. “comparative economics of villages in 18th century”)</i>
<i>Discussion</i>

In this case, each thematic section would contain introductory info, explanation of methods, listing of results, and perhaps preliminary discussion of significance.

Remember—whatever approach you take, *focus on your main idea*: “What do you know now that you didn’t know before you did the work you’re reporting in this paper?” And remember—editors care about *novelty*!

Academic Paper’s Universe – 3 Major Parts



Writing the Abstract



[Please review the following points **before** the online seminar]

What role does the abstract play in modern publishing?

As it has for more than a couple centuries, and in various forms throughout the earlier history of science, the abstract today performs the same basic *function*: to give a **clear, comprehensive**, useful, and **engaging** summary of another document, i.e., the *main paper*.

However, with the rise of the internet over the past few decades, the abstract has taken on new *applications*, including indexing through massive and interconnected search engines, appearing in compilations on instantly accessible websites (as opposed to visiting large libraries), and previewing full papers on publishers' websites (often requiring a substantial purchase for those attracted by the abstract).

So in a sense, the abstract has truly become an advertisement of accomplished and published research work to researchers worldwide. *Will it attract "buyers"?*

What are the main types of abstracts?

Informative Abstract

This is a concise statement of *what you did, how you did it, what you found, and what your findings mean*. It describes the *essence* of your full paper. Its length is set by the journal publisher or conference organizer, with typical maximum lengths between 100 and 300 words (a very common range for scientific publications is 150–250 words). A key feature of the abstract is that it is *self-contained*, or *autonomous*—the reader must be able to understand it without referring to any outside source.

Extended Abstract

An Extended Abstract is usually written *before* the complete paper is submitted. It includes *more detail* than a regular abstract, and possibly a few tables and figures. These abstracts are submitted to journals/conferences to determine *if* there is interest in the complete paper being published. Length is typically 800 words or even more.

Sectional Abstract

Publishers often call this a Structured Abstract. This format uses explicit titles and paragraphs for each major aspect of the work: Introduction, Methods, Results, and Conclusion. This type of abstract is often required by medical journals and related fields like healthcare and natural science. Typical length is 300–400 words.

Other: Some journals use a “graphical abstract” that includes a “teaser” figure showing a graph, photograph, or other illustration. Follow guidelines for this.

Guidelines for writing an Informative Abstract

[Please review the following points **before** the online seminar]

1. The Abstract should read *independently* from the rest of the paper. Use *standard* words and phrases as much as possible; define *unfamiliar* terms or abbreviations. Do not make any references to *the body* of your paper (or any other paper).
2. Write the abstract **after** finishing the paper! Then you will have a fuller idea of the finished document's contents and key points and thus produce a better abstract in a more efficient way. Do *not* treat the abstract as a planning tool, such as an outline (see sample outline in appendix).
3. Organize it *in the same order* as your paper (a *parallel* structure).
 - Start with a *topic sentence* that states the primary goal and scope of your study or the reasons why you wrote the document. What was studied? What was achieved? What hypothesis was tested?
 - Give a brief description of *your methods*. Give the reader an idea of the *general approach used*, but only enough to provide a context *for the results*.
 - Summarize *your results*—describe findings concisely and accurately. Give *specific* results. If there are too many findings to include all of them, give only *the most important*.
 - State *your conclusions*—what are the *implications* of your results.
4. Do not begin by simply *repeating the title* as a sentence. Your Abstract will not appear anywhere without the title.
5. Be as *concise* as possible without being cryptic (ambiguous) or obscure.
6. Give *background* information only if necessary, and then very *briefly*. Descriptions of previous work, conflicting theories, etc. belong in the Intro.
7. Do not include anything *not* in the body of the paper.
8. Keep it to *one paragraph*, usually no more than 250 words (or even limits of 150 or 100 words). However, some publications, like medical journals, require paragraphed “mini sections.”
9. Use *key terms* from your text to facilitate computerized text searching.
10. Use the *past tense* when talking about what you have done. Use the *present tense* if you are proposing something. Or use the “traditional” approach of writing *only* in the present tense to describe what the paper says. Be consistent.

Remember—the Abstract is almost always the first thing the *reviewer* reads. It is therefore critical that it be written *clearly and simply*. If the Abstract doesn't attract the reviewer's interest, you're probably doomed.

Sample Abstract

1) Two approaches to improving the operation of the future virtual private networks (VPNs) that will be created on broadband integrated services distribution networks (B-ISDNs) are described and evaluated. 2) Simulation demonstrated that using a shared-buffer switch for traffic shaping smoothes bursty traffic effectively. 3) Study of various software architectures indicated that a layered-software architecture would allow new user services to be implemented quickly. 4) VPNs running on B-ISDNs will give users a powerful means of transporting integrated data and voice streams.

Analysis:

1st sentence: what was done and why

2nd sentence: method and result

3rd sentence: method and result

4th sentence: significance

Abstract Writing

Sample for Analysis and Correction

[Before the seminar, please try to revise the following weak abstract so that it more closely follows the principles given above. An analysis and revision of the following abstract is provided in the Post-course Review Package—please review that information carefully!]

Solid-block Laptop Assembly

For many years computer manufacturers have made various attempts to increase the body strength of their laptop chassis. This effort has resulted in some improvement based on materials choice and joint engineering, but so far no comprehensive solution to weak laptop bodies, and hence customer dissatisfaction, has been achieved. In this paper, we propose the solid-block technique to resolve this issue. This technique is based on forming the entire chassis from a single block of aluminum, as opposed to conventional methods. We were able to achieve a huge improvement in torsional strength over previous assembly techniques. This will give manufacturers a distinct advantage in the market. Furthermore, we could recover a lot of raw material previously wasted in machining because our method uses a new aluminum extrusion technique developed in China.

Parallelism

[Please review the following points **before** the online seminar]

What is the Parallelism Rule?

All items in a series must have the same grammatical form.

What is a Series?

Here are a two-item series and a three-item series.

A and B (two-item series)
A, B, and C (three-item series)

What is Grammatical Parallelism?

If A is a noun, then B and C must be nouns. If A is an adjective, then B and C must be adjectives, and so on. This rule applies to single words, phrases, clauses, and sentences.

- x The unit is *stronger, lighter, and costs less to operate.*
- o The unit is *stronger, lighter, and more economical.*

The first sentence is not parallel. Items A and B (*stronger* and *lighter*) are adjectives in comparative form; item C is a verb and modifier.

The second sentence recasts item C as an adjective in comparative form, making the series parallel.

What is Conceptual Parallelism?


Just as the wording should be alike in grammatical form, the ideas expressed in the items of a series should be conceptually alike. They should all be activities or states or requirements or procedures, and so on.

Where Must Parallelism Be Found?

As a minimum:

- among words, phrases and clauses within sentences
- within lists
- among section headings in chapters and reports
- in tables of contents
- in procedures and instructions

[Before the seminar, please try to complete the following exercise, making the sentences and text sections more “parallel.” Answers to these problems are provided in the Post-course Review Package—please review that information carefully!]

 **Exercise** Try your hand at correcting the parallelism mistakes.

1. The color, design, and how you word the warning show the nature of the potential danger.
2. Table 2 shows the procedures for opening the front panel, the side door, and accessing the rear panel.
3. The log lists favorites imported from earlier versions, files corrupted during conversion, and folders that the process deleted.
4. Setup asks you to input your name, select standard or custom installation, and for a drive and folder for the files.
5. The policy requires that a safety summary be included, that acronyms appear in an appendix, and you should prepare an index.
6. (From a table of contents, i.e., chapter headings and sub-headings.)
 - 1) Applying Character Formats
 - a. Use the Format menu.....
 - b. Using the shortcut keys.....
 - c. To apply formats directly.....
7. (From a procedure in the text.)

To find and replace a word:

 1. You should go to the beginning of the document by Pressing CTRL+Home
 2. Click Edit ⇒ Replace.
 3. Then you enter the text you want to replace in the Find what box.
 4. New text: in the Replace with box.
 5. Clicking Replace does it.

8. (From a procedure in the text.)

To save and continue working:

1. Click the save icon.
2. Type the document name.
3. Then you click OK.

To save and rename:

1. Select **Save as** from the File menu.
2. Type in the new name.
3. Then you click OK.

Saving and Closing:

1. Select Close from the file menu.
2. Click Yes to save your latest changes.

Changing Abstract Nouns into Action Verbs

[Please review the following points *before* the online seminar]

Purpose

To achieve a clear, concrete style that makes your writing easier to read and understand.

The Problem

One problem in technical writing is the overuse of nouns. This abuse occurs when we assign to a noun an action that is more clearly expressed by a verb.

the **penetration** of the layer by the beam vs. the beam **penetrates** the layer

Such nouns are often abstract, making the sentences difficult to understand. And the sentences lack motion, because these nouns often combine with weak verbs (be, do, make, etc.). Such writing is more difficult to read because it lacks action to propel the reader along.

This tendency is reinforced for Japanese writers of English by the preference for nouns in the Japanese language.

ユーザーにイメージをみてもらうためにプロトタイプデモを行うことになった。(Yuza ni imeji o mite morau tame ni purototaipu demo okonau koto ni natta.)

Direct translation of such passages often produces *abstract noun + weak verb* in English:

To give the users a general idea of the system, I decided to ~~conduct a demonstration of demonstrate~~ the prototype.

Use nouns to name the people, places, or things that act or are acted upon, experience an event or state, or exist. Nouns are best as actors or receivers. The action should be expressed by verbs.

The Solution

Check your writing for overuse of nouns, abstract or otherwise. (You can recognize many of the abstract nouns by the endings *-tion* and *-ment*.) Where reasonable, convert the noun to its verb form, use that verb as the main verb of the sentence or clause, and change the sentence as necessary.

It is not enough to simply change the noun to a verb:

the **penetration** of the layer by the beam → ~~penetrate the layer by the beam~~

Be sure you properly identify the subject and the object:

The beam penetrated **the layer**.

Often, such revision forces you to express a subject or object that the sentence did not contain. Explicitly stating such subjects or objects makes the sentence clearer.

Do the formatting, then the installation of the operating system.

Format what? The operating system? No, the disk!

First, format **the disk**; then install the operating system.

Making the object of “format” explicit in the revised sentence prevents a possible misunderstanding.

[Before the seminar, please try to complete the following exercises, identifying and using “action verbs.” If you have limited time, just skip to Exercise 4. Answers to these problems are provided in the Post-course Review Package—please review that information carefully!]

  **Exercise 1**

What is the verb form of the following nouns? (Write the verb form in the blanks.)

Noun	Verb	Noun	Verb
examination	<u>examine</u>	explanation	_____
operation	_____	alignment	_____
conclusion	_____	measurement	_____
use	_____	development	_____
connection	_____	installation	_____
correction	_____	response	_____
repairs	_____	assembly	_____
modification	_____	detection	_____
shipment	_____	satisfaction	_____
inspection	_____	improvement	_____

 **Exercise 2**

Which word in the sentences below the following blanks implies the central action? What is its corresponding verb form? (Write the word and verb form in the blanks.)

Action word	Verb form	Action word	Verb form
1) <u>excess</u>	<u>exceed</u>	11) _____	_____
2) _____	_____	12) _____	_____
3) _____	_____	13) _____	_____
4) _____	_____	14) _____	_____
5) _____	_____	15) _____	_____
6) _____	_____	16) _____	_____
7a) _____	_____	17a) _____	_____
7b) _____	_____	17b) _____	_____
8) _____	_____	18) _____	_____
9) _____	_____	19) _____	_____
10) _____	_____	20) _____	_____

- 1) The file size is in excess of the memory capacity.
- 2) Appendix A provides a description of each of these subassemblies.
- 3) It makes corrections to the code automatically.
- 4) We accomplished development of the prototype quickly.
- 5) The users guide gives an explanation of how to install the software.
- 6) The operation of the system was efficient.
- 7) After making a check of the hardware environment, it performs installation of the utility programs.
- 8) We carried out the processing as the requests came in.
- 9) There was a rapid accumulation of data.
- 10) The feedback helped us realize a solution to the problem.
- 11) Lack of space placed a limit on the size of the system.
- 12) We made use of an existing program to demonstrate the DSM.
- 13) The attachment is a list of available field codes.
- 14) The observed results are in agreement with these figures.
- 15) This list shows the identity of the users.
- 16) Pushing “delete” accomplishes erasing of the file.
- 17) Do the formatting, then the installation of the operating system.
- 18) We did the design of the entire system in only two weeks.
- 19) When this feature is activated, automatic alignment of the text boxes is achieved.
- 20) We made modifications to the design accordingly.

 **Exercise 3**

Judging from the sense of the above sentences, identify the subjects and, if any, objects of the above verbs and the required tense of the verbs. (Fill in the blanks below.)

	Subject	Verb	Object
1)	<u>the size</u>	<u>exceeds</u>	<u>the capacity</u>
2)	_____	_____	_____
3)	_____	_____	_____
4)	_____	_____	_____
5)	_____	_____	_____
6)	_____	_____	_____
7a)	_____	_____	_____
7b)	_____	_____	_____
8)	_____	_____	_____
9)	_____	_____	_____
10)	_____	_____	_____
11)	_____	_____	_____
12)	_____	_____	_____
13)	_____	_____	_____
14)	_____	_____	_____
15)	_____	_____	_____
16)	_____	_____	_____
17a)	_____	_____	_____
17b)	_____	_____	_____
18)	_____	_____	_____
19)	_____	_____	_____
20)	_____	_____	_____

 **Exercise 4**

Revise the original sentences, using the subject / verb / (object) constructions you identified above.

- 1) The file size is in excess of the memory capacity.
- 2) Appendix A provides a description of each of these subassemblies.
- 3) It makes corrections to the code automatically.
- 4) We accomplished development of the prototype quickly.
- 5) The users guide gives an explanation of how to install the software.
- 6) The operation of the system was efficient.
- 7) After making a check of the hardware environment, it performs installation of the utility programs.
- 8) We carried out the processing as the requests came in.
- 9) There was a rapid accumulation of data.
- 10) The feedback helped us realize a solution to the problem.
- 11) Lack of space placed a limit on the size of the system.
- 12) We made use of an existing program to demonstrate the DSM.
- 13) The attachment is a list of available field codes.
- 14) The observed results are in agreement with these figures.
- 15) This list shows the identity of the users.
- 16) Pushing “delete” accomplishes erasing of the file.
- 17) Do the formatting, then the installation of the operating system.
- 18) We did the design of the entire system in only two weeks.
- 19) When this feature is activated, automatic alignment of the text boxes is achieved.
- 20) We made modifications to the design accordingly.

Common Problems in Technical Writing

[Before the seminar, please try to correct the following common problems in writing. Some of the problems break “rules,” while others just show bad logic. Answers to these problems are provided in the Post-course Review Package—please review that information carefully!]

1. The Printed Page: typography, spacing, punctuation: little things that can drive an editor crazy

- | <u>Find the Problem</u> | <u>Analysis/Comments</u> |
|---|--------------------------|
| 1. <i>General comma use</i> <ul style="list-style-type: none">• Most of the equations did not produce consistent results but we gathered enough data to formulate a hypothesis.• The new lens provided a better resolution in the z-axis, and generated much clearer images. | |
| 2. <i>Never use Japanese two-byte fonts to write English text!</i> | |
| 3. <i>...was 200MHz.</i> | |
| 4. <i>...according to three effects : extra...</i> | |
| 5. <i>It is important to add various information(or data)to the...</i> | |
| 6. <i>Typography has kept pace with the changes in equipment. This can be seen with writing tools. For example, we can...</i> | |
| 7. <i>The corpora include not only part-of-speech (POS) tags, but also frequency ratings based on normal usage.</i> | |
| 8. <i>The depth variable, xy, is used to represent the additional dimension.</i> | |
| 9. <i>Note that, all possibilities mentioned above are listed in the table.</i> | |
| 10. <i>Recently we obtained additional results for this.</i> | |
| 11. <i>3 “straight-line symbols”</i> <ul style="list-style-type: none">o ...use a three-dimensional space.x ...in the range of 3.4-3.8 μm.x ...these deviations-typical in such volatile environments-are... | |
| 12. <i>...real world testing at high-speed.</i>
<i>or</i>
<i>...high speed testing in the real-world.</i> | |

Common Problems in Technical Writing

II. Pesky Problems: prepositions, unneeded words, word choice

<u>Find the Problem</u>	<u>Analysis/Comments</u>
1. In generally, it is important to...	
2. Most of devices require...	
3. The subject approached to the second target position.	
4. ...that match to the actual events.	
5. Next, we discuss on the problems of...	
6. First, we explain about our new...	
7. Then the signal enters into the node.	
8. Then the signal leaves from the node.	
9. The resulting values are then combined together.	
10. This step is both necessary and important.	
11. For the purpose of comparison, we...	
12. ...was unsuccessful. Then, we had to attempt a different approach to...	

Common Problems in Technical Writing

III. Going Deeper: word order, logic, style

<u>Find the Problem</u>	<u>Analysis/Comments</u>
1. ...was carried out in order to satisfy eq. 1.	
2. ...have been also studied for...	
3. It is important to take net topology, traffic flows, user preferences, and data types into account.	
4. ...many issues, such as net topology, traffic flows, user preferences, data types, etc.	
5. This method can not handle such...	
6. ...were too high, so that we had to readjust the...	
7. A relationship between ABC and XYZ was not found.	
8. This measure can also be applicable to other types of...	
9. In case of using aluminum, we must...	
10. We used the Johnson's Theorem to...	
11. ...and they had same value.	
12. This step is very essential.	

Common Problems in Technical Writing

IV. Building Your Paper: frequently found problems in academic/scientific papers

<u>Find the Problem</u>	<u>Analysis/Comments</u>
1. These informations were useful for...	
2. ...in handling delicate equipments.	
3. ...and so both of materials can be used to...	
4. For better coverage, we installed multi-sensors in the room.	
5. At first, the scan range must be... At last, the new range should be...	
6. Firstly, we...Secondly, the...Thirdly...	
7. Even a backup power supply is installed, there is still danger of...	
8. Then we searched a close match in the second lexicon.	
9. The system is consisted of several...	
10. The cut-off value is depends on...	
11. ...is uneven. Because the two probes have different intensity settings. ...is uneven. Whereas the other device produced an even level.	
12. This technique is to measure the inherent fluctuations in...	

Common Problems in Technical Writing

V. The Final Product: simple ways to improve your academic/scientific paper

<u>Find the Problem</u>	<u>Analysis/Comments</u>
1. [beginning of Abstract, Introduction, or other major section] A new hue-filtering algorithm for next-generation vehicle-mounted cameras is proposed in this paper.	
2. [beginning of Abstract/Introduction] The Internet has revolutionized the way information is distributed throughout the world.	
3. [beginning of Abstract/Introduction] Let XY^{p7} represent a finite set of real-world variables in a...	
4. It should be pointed out that the... It is important to note that the... Here, we note that the... Note that the...	
5. 1.1 Simulation model In this section, we describe the simulation model.	
6. ...was also reported in [5] and [6].	
7. ...and many such cases can be found in the literatures. Many researches have investigated the problem of...	
8. Figure 6 shows that, as a result of this modification, we could obtain a ten-fold increase in...	

Sample Outline: Basic Technical Paper

Tentative Title: "RoboDancer: Android Dance Instructor"

Abst-

Proposal: Robot dance instructor to teach shy people

Features: dance role/gender, structure, dance database

Experiments/results: expert eval./user survey

Impact: Anyone can learn dance w/o embarrassment

Intro-

Prob. Statement: Many people want to learn to dance, but are embarrassed to take classes with other humans

Bckgrnd: Rising desire to learn dance by movies/YouTube, etc. but many people drop out of dance school, too shy

Prev Works:

-Rodgers et al. – Video-based VR & HMD

-Kelly & Astaire – Footstep carpet (lights & haptic FB)

-Pavlova & Duncan – VR Dance Hall (holographic sys)

-other? Ask Prof Takahashi and Prof Soryoan

Our Apprch: Android Dance Instructor

Features Overview:

-Independently set gender, lead/follow roles of android

-Huge database of dance styles, difficulty levels

-Structure: strong but soft materials for flexibility

-Safety: kill switch, weight balance, full elec. Insulation

Preview of sections' contents

Meths-

Construction: theoretical concept + actual components

-Dance-step DB: huge size, access by intuitive interface

-Materials and config. for flexibility & User safety

-Inflatable exoskeleton for easy storage

User Operation: keep brief!

Experiments

-Participants: age, gender, dance experience; payment

-Eval. by human experts after training of participants

-User Satisfaction Survey: ease, effectiveness, enjoyment

Results-

Expert Eval: training progress, resulting skill, trainee variance

User survey: range of resps, Likert answers, subjective comments

Group compare: by gender, age, dance experience, expect from survey

Discus-

Eval of Results

-Expert eval: criteria-based ratings, subjective opinions

-Survey results: reasons for high/low satisfaction, probs mentioned

-Group comp: hypotheses from feedback analysis

Shortcomings (to fix in future)

-Explanations of dance errors not so intuitive

-Voice recog. – requires user to speak loudly/clearly

-Still needs transitions betwn diff dance steps

Conclu- Prototyped dance instrctr achieved

Summrz key results – usability, training prog.,

Fut. Work – tackle abv probs, prod. scale-up, larger partcpnt base

Significance – "Promise of quality dance training in private setting without other students, human instrctr