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Easy and Lazy Technical Writing and Presentation

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Tech Writing May not be Easy

You'll be surprised to see invited speakers are often bad in presentation.

- 'Cause you do not know how. Neither, does your boss! You should know the most efficient way.
- Lectures/books help, but feedback is a must. You need consultation.
- I have been helping inside and out. 15 invited talks and courses. You are always welcome for free!
- Typical traps: Problem-solution relationship, gap between J-E, material preparation, …
- "EZ and Lazy Tech Writing" and "Visible and EZ2understand Slide Preparation" are designed for you!

Contents

- How to draft a paper
- Structure of a paper
  - Title, Abstract, Introduction, Body, Conclusion, Acknowledgment, References, Appendix
- Tips for good expressions
- Keys to a success
- Questions before submission

How to Start

Slides First !

- Collect basic items of the paper (Fig/Ref/,,,)
- Start from a template
- Fill in necessary information in each page
- Select figures/tables to use
- Balance sections and each of them
- Reorder slides whenever needed (easy)

What is good logic?

- Easy to follow (No question/rethinking)
- Possible to predict the next content

Efficient Paper Writing

1. Read **tech writing books**. Practice what are written there.
2. Prepare **slides first**. Prepare figures and tables first, then, phrases in slides.
   - Will make good logical flow.
   - Write what readers expect next.
3. Spend sufficient time for introduction.
   - A view of the problem from the other side should be your solution (next pg).
4. Have your draft reviewed by others.
5. Keep writing for practice.

Examples of Paired Words

computations inefficient	efficient compact low complexity low power
slow convergence	fast convergence
degraded	good superior
no analytical support	analysis
no implementation	implementation

Structure of a Paper

- Title – expresses the contents in a line or two
- Abstract – attracts people to the paper
- Introduction – describes background and motivation
- Body – beef of the hamburger, *reason d'etre* of the paper
- Conclusion(Summary) – summarizes the body
- Acknowledgment – expresses thanks to whom helped in the course of the research
- References – gives pointers to related readings and basis for the facts appeared in the paper
- Appendix – gives detailed derivation of equations, which is off the logical main stream

Title

- Not too general.
- Include words of the features.
  - specifies the features and clarifies the gains for readers.

    e.g. new functionality, reduced computations/memories, fast convergence, easy design
- As short as possible (< 2 lines, generally).
- Simple expressions and/or noun phrase.

Example 1

- Gain for the User + Most Important Keyword
  e.g. Computations, Convergence time, Easy Design, etc.

  Computationally Efficient **xx** Algorithm
  Fast Convergence Algorithm Suitable for **xx**
  Easy-to-Design **xx** System
- Often found in papers that propose a new algorithm or system.

Example 2

- Important Feature + Most Important Keyword

  e.g. "High Quality 4 kb/s CELP Coding Based on Multistage Vector Quantization"

(May be considered as a combination of Ex. 1 and 2.)

"Contour Extraction Algorithm Based on Multiviews,"

"Low Bitrate Video Coding Based on Multiview Contour Extraction"

Example 3

- Most Important Keyword+'What is done'
  - *e.g.* "Evaluation of a Double-Talk Detection Algorithm," "Chip Area Comparison for Multiply-and-Add Circuits"
- Often found in papers that present comparison.

Abstract

- Present tense in a single paragraph.
  - Because it is a fact with “This paper” as the subject
- Topic sentence (Contents in a single sentence)
  - This paper proposes/presents *“something like paper title.”*
- Contents in the same order as in Body.
  - Features/Advantages of the proposed method.
- Clearly state object(s)/condition of evaluation/ investigation/comparison.
- Be specific with values.
  - As much as #% compared to …..
- Results and application/future study.

Abstract

1st sentence represents the paper contents.
(Topic sentence, similar to the title.)

1. New Proposal

(In this paper,) xx is proposed.

This paper proposes xx.

2. Comparison

This paper presents xx.

xx is similar/equal to the title.

Abstract 2

Contents in the same order as in Body

1. Features of the proposed method and advantages over the conventional method.
   - *e.g.* pp eliminates qq (which was the serious problem in the conventional method).
2. Subject of evaluation/comparison/investigation and condition
   - Describe in a most specific way.
     - *e.g.* “as much as x%,” “y% in oo condition.”
   - “Effective/Useful for xx,” “applicable to xx.”
   - May present difference results for different conditions.
     - *e.g. xx for the condition of yy,,,,,,*

Abstract 3

Conclusion

1. Evaluation results/Applications.
2. Evaluation results(advantages)/ Analysis/Discussion

Introduction

- Most difficult in paper writing.
- Write the position of the paper (research).
- “Position” should have been clarified in the beginning of research.

1. Research background
2. Research history
3. Research topic
4. Paper structure

Introduction - Background

- From general description to specific description
- General description=what are found in the newspaper
- Clearly describe the position in the overall research
- Clarify the application

Introduction – Research History

- Research overview (Who has done what, directly related to the paper)
- Introduce past important research and explain the position of the paper from viewpoints of technology and performance.
  - A. “Who,” (“when”), “what,” and “how it was.”
  - B. Its feature(s) or contribution
  - C. Its problem(s)
- Repeat A ～ C a couple of times.
- The problem described finally should be equal to that solved in the paper. Clearly state this problem.

Introduction – Paper Topic

- Describe what you have done in the present tense.
  - *e.g.* This paper proposes + topic sentence

    This paper presents + topic sentence

    xx is achieved by doing yy.
- Use the present tense, because it is a fact.

Introduction – Paper Structure

- For making a long paper easy to read.
- Not included in short papers.
  - *e.g.*
    The next section explains xx.
    Section 2 explains xx to clarify the problem.
    The proposed method is presented in details in the following section.
    Finally, by computer simulation results, yy is validated.
    Finally, hardware evaluation confirms its validity.

The Three Sentence Introduction

- What has been presented as a conventional method?
  - Describe it w/ the advantage(s) and a reference.
- What is the existing problem?
  - Describe the problem(s) of the conventional method.
- What is the topic of the paper?
  - This paper proposes *“something like the paper title.”*
- 3 Sentences become 3 paragraphs in a long paper.

Conventional Method

What has been presented as the conventional method?

Useful Expressions.

- A has(A and B have) been proposed [1].
- A [1] is one of the most promising systems(techniques) in field B.

Problem

What is the existing problem?

Useful Expressions

- A large number of computations are required.
- The convergence speed is slowed down.
- A is not efficient. (A is not sufficiently B.)
- The quality of C is degraded.
- It requires function D.
- There is no theoretical support for A.
- No implementation of A has been reported.
- A does not provide E and F simultaneously.

Paper Topic

This paper proposes (presents):

- A computationally efficient A based on B.
- A fast convergence A based on B.
- An efficient A based on B.
- A with good C quality.
- A which does not require function D.
- An analysis of A.
- An implementation of A.
- An A which provides E and F simultaneously

Body

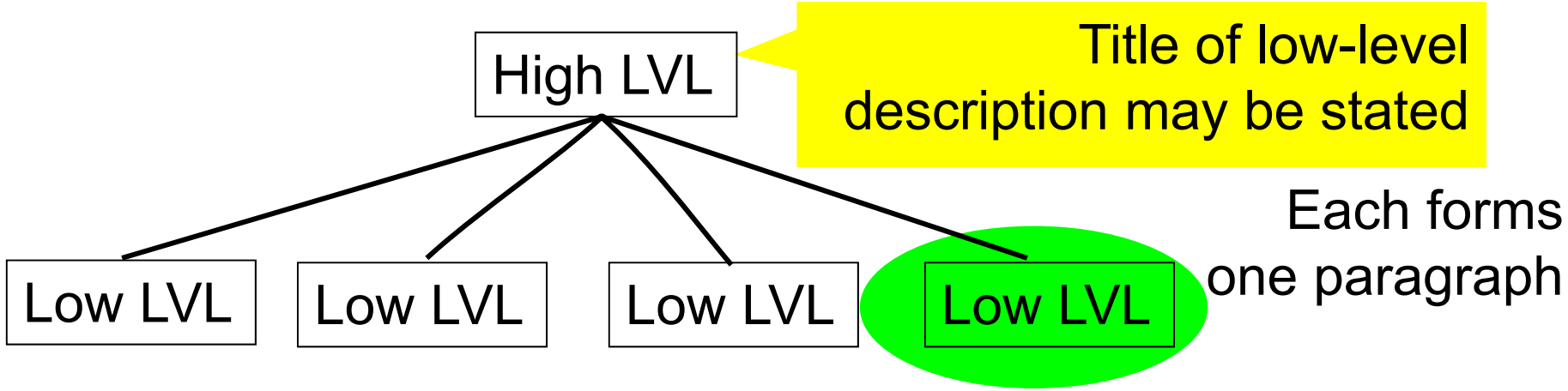
Keep the following in mind:

- Describe what you have done.
- May have a section for conventional method when problems are complicated.
- In the same order as in the Abstract.
- Never in the order of how you have done (A paper is not a report of an experiment).
- Provide detailed information concisely so that readers may verify the results.
- Never make a contradiction with the position made in the Introduction.

Description in Body

Top-Down Description

- Position first, then, describe the basis
- From higher- to lower-level description
- Lower-level description should be more detailed with a larger volume
- Each low-level description forms a paragraph.



Body: Patterns

- Pattern I: Proposal of a New Algorithm (System, Method, …..)
  - (1) Conventional Algorithm-> Emphasize problems (=what is solved by the proposed)
  - (2) Proposed Algorithm
  - (3) Evaluations (Conditions, Results, Discussions)
- Pattern II: Comparison and Evaluation
  - (1) Description of the System for Evaluation
  - (2) Conditions for Evaluation
  - (3) Evaluation Results
  - (4) Analysis and Discussions

Easy understanding is the 1st priority!

Conclusion

- Similar to Abstract.
- May be made by changing the Abstract to the present perfect tense. (*e.g.* A has been proposed. A has been presented.)
- Everything should have appeared in the body.
- Chronological order as in the body.
- Collecting the topic sentences from the body and changing the tense should make a good conclusion, assuming a good body.
- Future research topics may be added if there is any. (*e.g.* Future research includes investigation of A.)

Acknowledgment

Be Specific

- Full name and his/her affiliation (so that s/he can be identified)
- Clearly state what is acknowledged.
  e.g. “The authors would like to thank *firstname lastname* of *affiliation* for providing data from real environment.”

References

- Supplement for simplifying a topic in the paper, which is off the main stream.
- Basis for background (Text books, Tutorial papers, etc.)
- Basis for parameter settings.
- Follow the specified format for the journal.
  - Different commas and/or parentheses for different journals.

Appendix

- Eliminate unimportant explanation, which is off the main logical stream.
  - *e.g.* Basis for parameter settings.
- Derivation of equations, proofs, etc. (Put only the result in the body).

Tips for Good Expressions

- 1 Sentence for 1 Content. A single sentence for multiple contents makes a “twisted” description.
- Avoid multiple of’s in a single sentence. (Up to 2).
- No redundant expressions.
  - *e.g. This report reports ,,,,,,.*
- Acronyms should be fully spelled out at its 1st appearance.
  - FFT (fast ….) or fast Fourier transform (FFT) ?

Keys to a Success

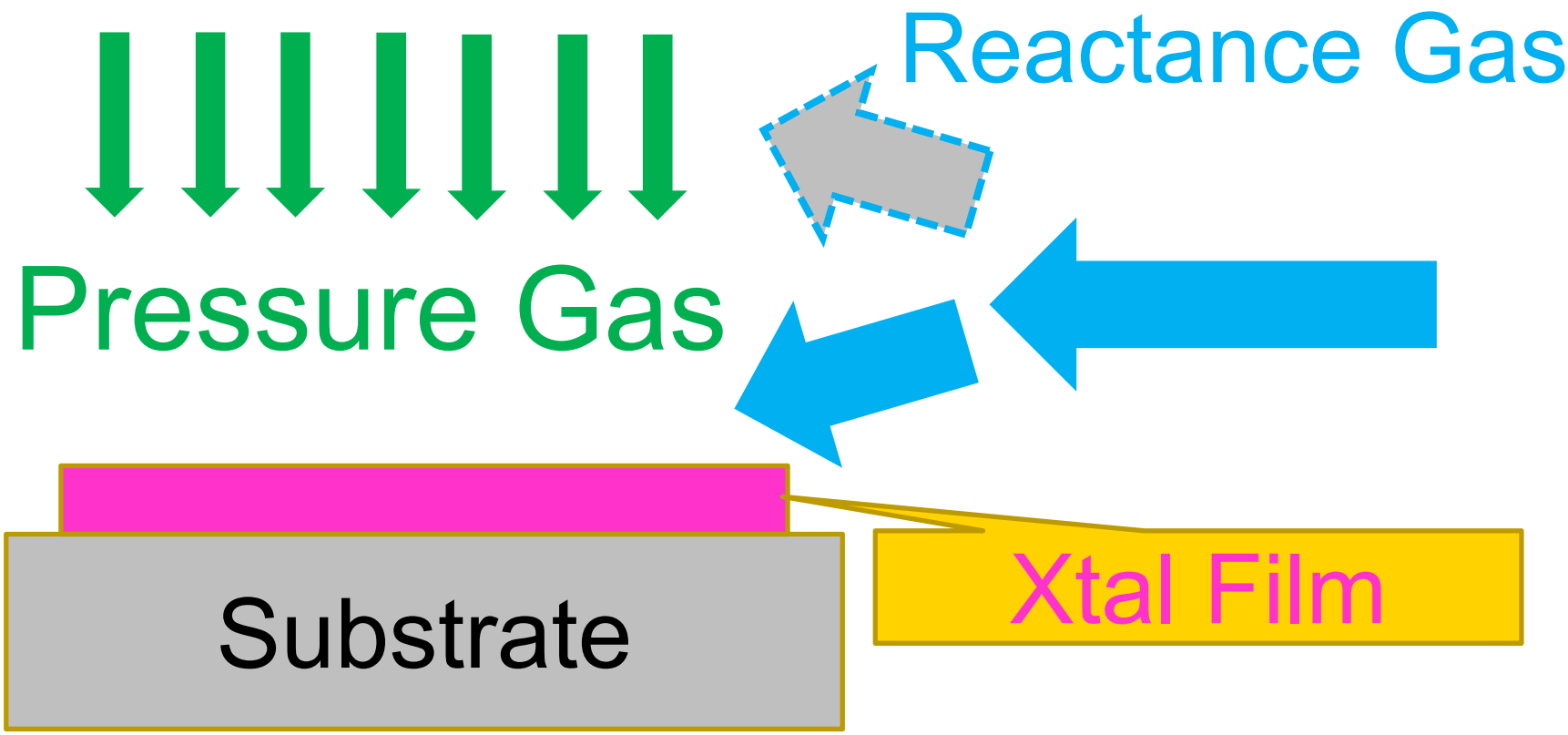
Problem-Solution pair is the key

1. Clarify the benefit(s) of the research(Paper)
2. What brings the benefit(s)? Drawback
3. What is the **opposite** of the **benefit(s)**
4. What is the **conventional technology** w/ the drawback?
5. Describe it in the 2nd last paragraph of Introduction and design Introduction
6. Put general applications in the 1st paragraph

Example: Problem-Solution Pair

Blue LD : 2014 Nobel Prize in Phisics

Problem Analysis and Solution



Keys to a Success

Problem-Solution pair is the key

1. Clarify the benefit(s) of the research(Paper)
2. What brings the benefit(s)?
3. What is the **opposite** of the **benefit(s)**

Drawback

1. Blue LD Chrystal (Fabrication of)
2. **Contact** of Reactance Gas w/ Substrate (by Pressing Gas)
3. **No** Reactance Gas **Contact**

Be Prepared for Traps

- Frequency bands, where an estimated SNR is low, are replaced

Wrong!

Bands are not replaced, but their components.

Components in the frequency bands, where an estimated SNR is low, **are replaced**

Components in the frequency bands, where an SNR is estimated low, **are replaced**

Yet Another Trap

In impact noise sections, rejection errors may occur.

Rejection errors(reject something by an error)
≠failure of detection

detection-failure

Detection failures may occur in impact noise sections

Questions before Submission

- What is the benefit of the research? (in what application)
- What makes it possible to achieve that benefit? List all components for the benefit.
- How good is it? (evaluation results)

Summary

- How to draft a paper
- Structure of a paper
  - Title, Abstract, Introduction, Body, Conclusion, Acknowledgment, Reference, Appendix
- Tips for expressions
- Keys to a success
- Typical errors
- Questions before submission

Presentation Material

Visible&Easy2Understand Slide Preparation

Basically, consecutive 2 or 3 pages constitute a single set of slides which represent a good and a bad example.

1. First page：Bad example
2. The following page：How it should be

No Sentence

- List keywords instead.

  NO SENTENCE ~~SENTENCE~~

- Bridge keywords with your talk.
- Redundancy can be fully eliminated.

No Sentence

- List keywords instead.

  NO SENTENCE ➡ ~~SENTENCE~~

- Key words Key words Key words

- Redundancy can be fully eliminated.

Use Big Fonts

44pt: USE BIG FONTS

32pt: USE BIG FONTS

24pt: USE BIG FONTS

18pt: USE BIG FONTS

Minimum 24pt

- Minimum 1cm in height/width for A4/letter size.
- Too much contents in a single page requires small fonts.
- Reduce contents in the page by removing redundancy or split it into 2 pages.

Use Big Fonts

44pt: USE BIG FONTS

32pt: USE BIG FONTS

24pt: USE BIG FONTS

18pt: USE BIG FONTS

Minimum 24pt

- Minimum 1cm in height/width for A4/letter size.
- Too much contents → Small fonts.
- Reduced contents ← Redundancy removal
- Split into 2 pages ← Reduction impossible

Use Gothic and Bold

44pt: Gothic and Bold

32pt: Gothic and Bold

24pt: Gothic and Bold

18pt: Gothic and Bold

44pt: Arial and Normal

32pt: Arial and Normal

24pt: Arial and Normal

18pt: Arial and Normal

- Bold and Gothic fonts are easy to read for the same size from a distance.

Use Gothic and Bold

44pt: Gothic and Bold

32pt: Gothic and Bold

24pt: Gothic and Bold

18pt: Gothic and Bold

44pt: Arial and Normal

32pt: Arial and Normal

24pt: Arial and Normal

18pt: Arial and Normal

More visible from a distance (same size).

Eliminate Unnecessary Space

- It is often true that small font sizes are used in a slide w/ much open space.
- Enlarge figures and use a larger font size for a slide w/ much open space.
- Never add characters when you find more space available.

Eliminate Unnecessary Space

- Small fonts w/ much space: often true
- Much space → Larger figures/fonts
- Open Space → ~~More characters~~

Unnecessary space shall be eliminated!

Eliminate Unnecessary Space

- Small fonts ⟵ Much space
- Much space ⟶ Larger figures/fonts
- Open Space ⟶ ~~More characters~~

Use Colors

- Why are there color printers? Why has PC presentation become common?
- Use colors effectively and make the most important point visible.
- Pay attention to color combinations.

Use Colors

- Why color printers/PC presentation?
- Effective coloring, emphasize the point.
- Attention to color combinations.

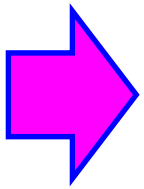
Color Combinations (FG/BG)

- Pale colors in the white background, or dark colors in the dark background is hard to read.
- Pale yellow and pale blue should be avoided for white background.

Color Combinations (FG/BG)

Pale colors in white

Dark colors in dark



Hard to read

Avoid

Pale yellow

Pale blue

for white background

Put **some color** in the background

Appeal to the Sight

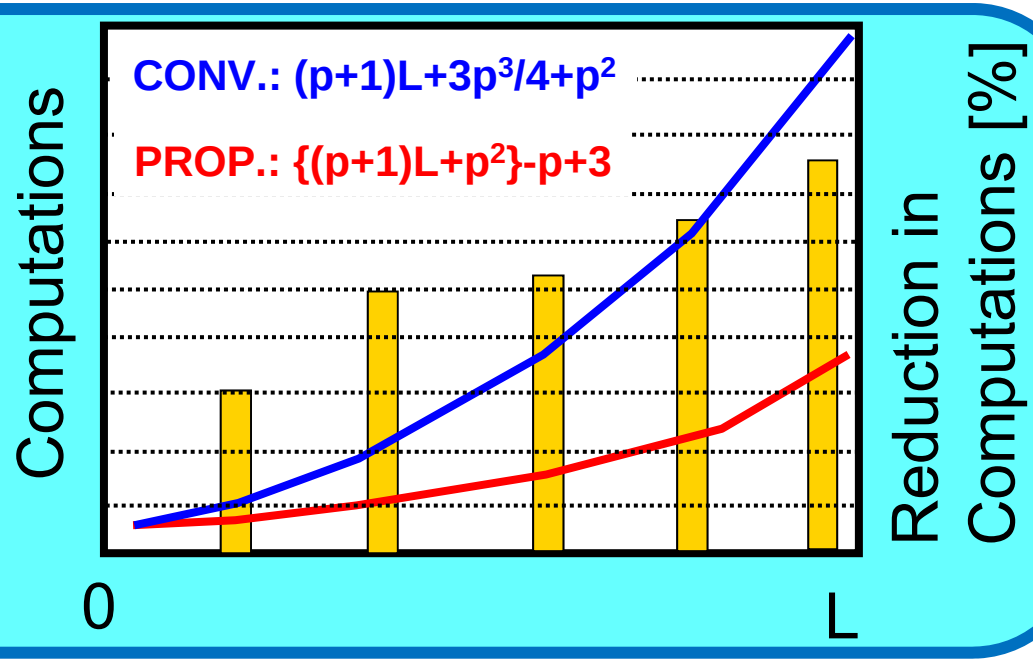
- A single illustration or one graph talks much more than tens of words

Appeal to the Sight

Tens of words

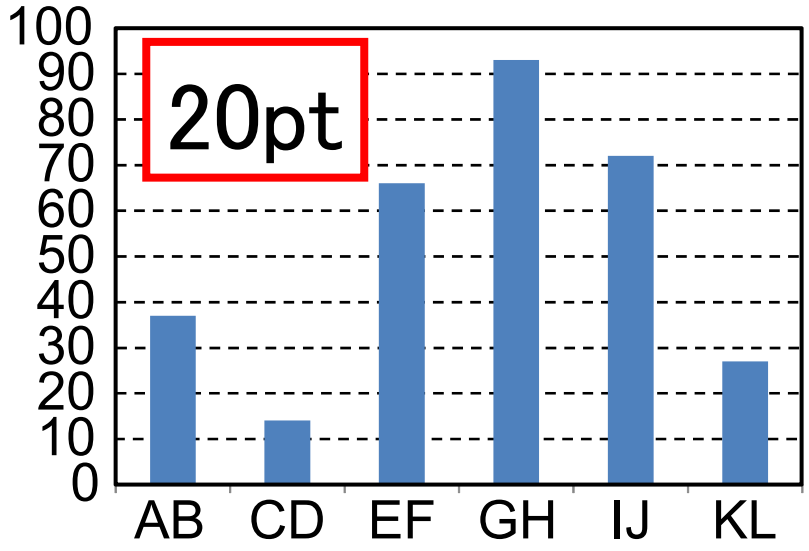
Algorithm	COMPUTATIONS
CONVENTIONAL	$(p+1)L+3p^3/4+p^2$
PROPOSED	$\{(p+1)L+p^2\}-p+3$

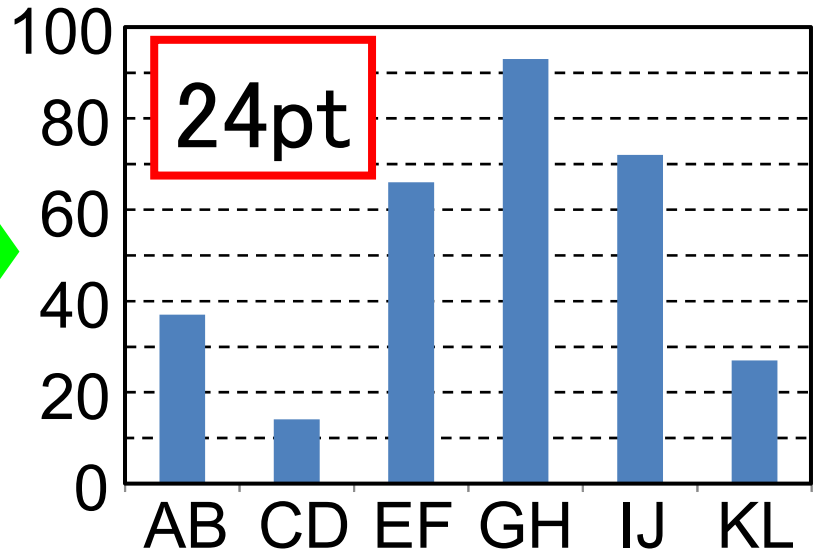
- Illustration
- Graph



Graph Drawing

- Legend：Inside the graph for space saving
- It allows a bigger graph
- Font size：Figure ≧ Body
- Decimate index to scales appropriately





Summary

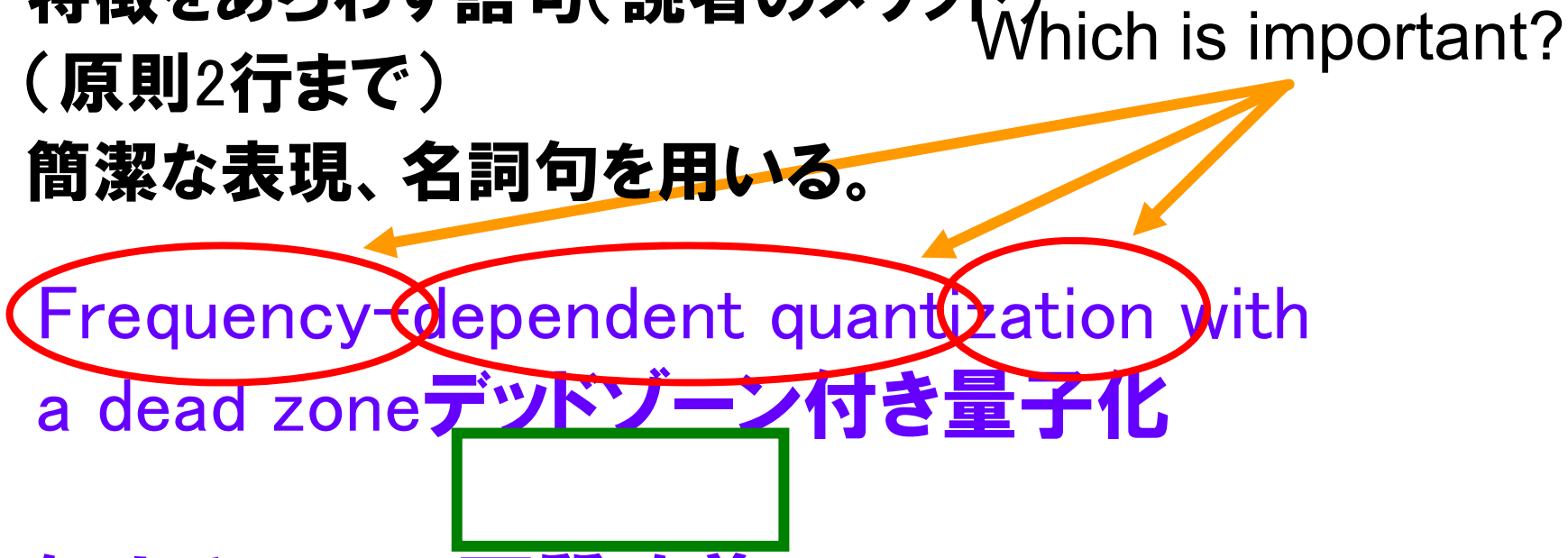
- How to draft a paper
- Structure of a paper
  - Title, Abstract, Introduction, Body, Conclusion, Acknowledgment, References, Appendix
- Examples of expressions
- Preparation of presentation material

Check Sheet

- ☐ Phrases instead of sentences
- ☐ Minimum 24pt font size
- ☐ Gothic font used
- ☐ Bold font used appropriately
- ☐ No redundant space
- ☐ Effective use of colors
- ☐ Appropriate color combinations(FG/BG）
- ☐ Tables used as much as possible
- ☐ Appropriate types of graph
- ☐ Legend inside graph, decimated scale
- ☐ Font size in figures bigger than in body

Empowered by Innovation

- 特徴をあらわす語句（読者のメリット）
- （原則2行まで）
- 簡潔な表現、名詞句を用いる。



- によるAVCの画質改善
- ポイントは、画質改善？
- AVCとは？