

Seminar: Entwicklungsprozess von Software-Produktlinien

Academic Writing II

Sandro Schulze

WiSe 2012/2013

Keep it short and simple

- Remove clutter
- Use short words
- Keep sentences short with simple structure
- One topic per sentence/paragraph/section

Example

Because we knew nothing about local conditions, we could not determine how effectively the committee had allocated funds to areas that most needed assistance.

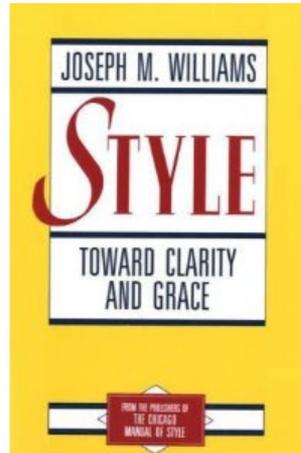
Our lack of knowledge about local conditions precluded determination of committee action effectiveness in fund allocation to those areas in greatest need of assistance.

Example 2

Many program variants in a domain can be created from a software product line with a single code base by a generation step. Testing and ensuring type safety for the entire product line is difficult, because generation can produce potentially millions of variants. An extension of the calculus Featherweight Java with feature annotations for product-line development is provided. A discussion of solutions for the problem of typing mutually exclusive features is presented. A guarantee that all possible program variants are well-typed is given, by providing an extension to Featherweight Java's type system. An implementation of an own language-independent product-line tool CIDE has been created with the help of this. Several type errors were found in existing product lines with it.

Name Characters and Actions

- Subject of a sentence names a character
- Verbs name action involving characters



Fixed Grammatical Structure:	Subject	Verb	Complement
Variable Meaning:	Character	Action	

Active Voice

- Write in active voice, avoid passive
- Make clear who is acting

The following the theorem can now be proved.

The data were collected.

Several of the data sets were lost.

To get advice, an expert must be consulted.

Who is Acting?

- Common knowledge in the field? Or contribution by the author?

It is shown that stable graphs are closed.

It is hypothesized that ...

- Do not hide your contribution

We have shown that stable graphs are closed.

Hermann has shown that stable graphs are closed [12].

We hypothesize that ...

Missing subjects

- Always provide a subject

Termination occurs after 23 iterations.

The program terminates after 23 iterations.

Strong Verbs

- Use strong verbs
- Avoid “be/is/are”, “has”, “do”, “use”
- Also weak: achieve, carry out, conduct, occur, effect

the algorithm supports effective garbage collection
in distributed systems

the algorithm collects garbage effectively
in distributed systems

Nominalization

- Verbs are stronger than nouns
 - discovery -> discover
 - movement -> move
 - collaboration -> collaborate

- Verbs are stronger than nouns
 - difficulty -> difficult
 - applicability -> applicable
 - difference -> different

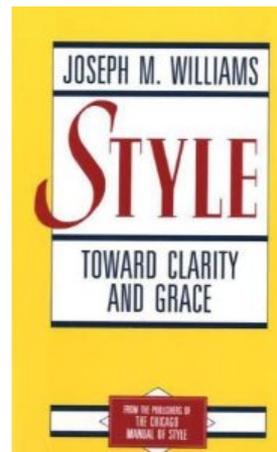
Replace Nominalization

- Use strong verbs

The police conducted an investigation of the matter.

Term structures can be utilized for dynamic storage of terms.

Local packet transmission was performed to test error rates.



Example 3

Despite the knowledge of the need by cities for new revenues for the improvement of their schools, the Governor executed a veto of the budget bill to give encouragement to the cities for an increase of local taxes.

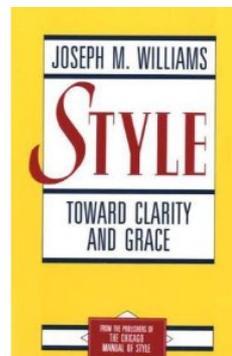
The more effective presentation of needs by other Agencies resulted in our failure in acquiring federal funds, despite intensive lobbying efforts on our part.

Cohesion

- Sentences
 - Subject: ideas already mentioned / familiar ideas
 - Verb: action
 - Object: new ideas
- Topics form a logical sequence of ideas



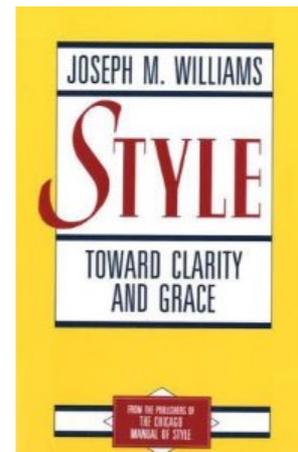
- Use passive voice for better cohesion where necessary



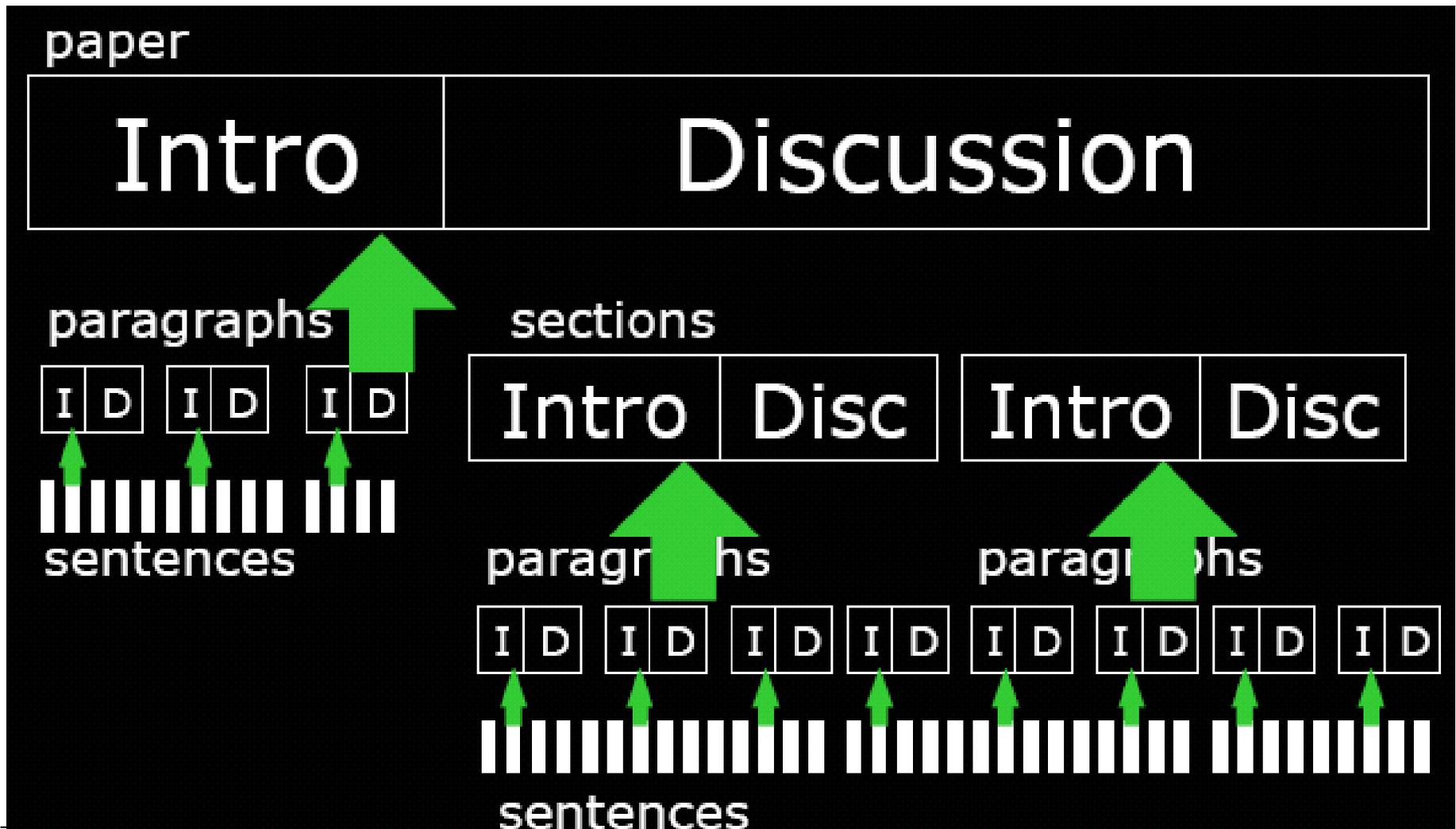
Connectives

- Adding
 - and, also, as well as, moreover, too, furthermore, besides, in addition
- Sequencing
 - next, then, first, second, third..., finally, meanwhile, eventually, after, before
- Emphasizing
 - above all, in particular, especially, significantly, indeed, notably, most of all
- Comparing
 - equally, in the same way, similarly, likewise, as with, like, compared with
- Cause and Effect
 - because, so, therefore, thus, hence, consequently
- Qualifying
 - however, although, unless, except, if, as long as, apart from, yet, despite
- Contrasting
 - whereas, instead of, alternatively, otherwise, unlike, on the other hand, in contrast

Coherence



Coherence on a Large Scale



Ambiguity / Undefined This

- be more specific than “this”
- “this” is often ambiguous

Lyn asked Max to use the p-test. This proved to be ill-advised.

The test was a poor suggestion.

Disturbing Max proved to be ill-advised.

Making this request proved to be ill-advised.

Max misunderstood the point of the test completely.

Formatting

- Never use **bold** font or underlined font in text
- Use *italics* for emphasis
- (On slides use **bold** font instead)

- Emphasize keywords and definitions of abbreviations

- You may use a different font for code

Callouts

- Reference all figures within the text
- Explain all figures either in text or with a long caption

In Figure 3, we show the distribution using a p-metric.

With Table 1, we summarize these results.

Numbers

- Spell out numbers < 10 , numerals otherwise
- Spell out numbers at the beginning of a sentence
 - Twenty-five people were...
- Use numerals for units and when referring to sections, pages or millions
 - 1 cm
 - Section 4
 - 3 million
- First, second, ... finally

Figure, Section, Chapter

- When used with a number, capitalize words such as Figure, Section, Chapter, Equation, ..., otherwise don't.
 - In this chapter, we combine Equations 3 and 4 with Line 12 and the previous figure... as shown in Figure 4, see also Section 4.
- No line break before a number or references
 - Latex: Figure~4, p.~3—4,

Commas

- Use commas for series

There can be different methods, bodies, or parameters.

- Use comma after introductory word/phrase

In summary, we described... However, it did... First, it...
For all typing judgments for terms, we need an environment

- Use commas for logical pauses, or when beginning new thought
- Comma splice: Do not use commas to join sentences, use semicolon or period instead

It is nearly half past five; we cannot reach town before dark.
It has been developed based on CIDE; however, it can...

Composite Words

- Usually no hyphen
 - front end, software product line, decision making
- Hyphen when two words modify a third
 - front-end code, decision-making process, rule-based parsing, internet-specific registration code
- Avoid connecting more than three/four words
 - operating-system--command error -> error of an operating-system command

high-school student vs high school student

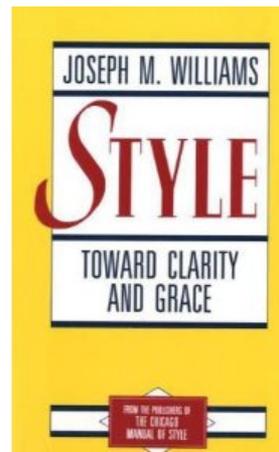
Examples

- aspect oriented programming
- annotation based approaches
- software product lines
- software product line implementation
- software product line implementation techniques
- commercial product line tools
- commercial quality Eclipse plug in
- Boolean satisfiability problem solver
- off the shelf SAT solver
- open source high performance database engine

Repetition

- Technical writing != prose
- Don't worry too much about repetition
- It's okay to start sentences with the same subject
- For important concepts, prefer repetition to synonyms -> less confusion to reader
- Define terms and use them

- Avoid monotony by writing clearly (avoid nominalization, passive, ...) instead



Cap/lc

- Titles and headings: often most words are capitalized
- Capitalize every word ≥ 4 letters, capitalize first and last word
- Do not capitalize propositions (in, on), articles (a, the), connectives

An Analysis of the Variability in Forty Preprocessor-Based Software Product Lines

A Model of Refactoring Physically and Virtually Separated Features

On the Impact of the Optional Feature Problem

Tables

- No vertical lines, only three horizontal lines (latex: booktabs)
- Provide units in header

SPL	t_{Var} (sec)	t_{SPL} (sec)
MobileMedia (rel. 6)	0.2	1.3
MobileMedia (rel. 8)	0.3	1.8
Mobile RSS Reader	0.6	8.3
Lampiro	2.0	19.0
Berkeley DB	2.6	21.0

SPL	FE	Virtual Sep.			D	Physical Sep.		
		CD/MD	AN			FM	CR/MR	GH
GraphPL	20	16/163	167	←	29	41/29	-	
Bali	18	40/503	122	←	18	26/9	-	
Berkeley	38	283/6515	2297	→	99	338/954	858	
Prevayler	5	140/994	175	→	8	13/19	28	

FE: number of features; CD/MD: class/member declarations; AN: annotated code fragments; D: direction of initial refactoring; FM: feature modules; CR/MR: class refinements/method refinements; GM: generated 'hook' methods

Table 1. Statistics before and after refactoring

I vs. We

- Never use “I” in academic writing
- Use “we” for things the authors did (even for a single author, don’t ask)
- Prefer “we show” to “the authors show”
- Figures or papers do not do anything, authors do
 - Figure 3 shows the results. [12] confirms...
 - -> In Figure 3, we show the results. Apel et al. confirm ...[12].

Singular vs. Plural

- Write definitions in singular where possible
- -> Less ambiguity

Product lines generate variants.
Feature models describe a set of features.
Features are distinguishing characteristics.

A product line generates a variant?

A product line generates variants?

Multiple product lines generate a variant?

Gender

The developer reconstructs the behavior in his mind.

The developer reconstructs the behavior in her mind.

The developer reconstructs the behavior in his or her mind.

Developers reconstructs the behavior in their mind.

The behavior is reconstructed in the developer's mind.

Which vs. That

- **Which** provides additional information
 - the meaning does not change when you remove the subsentence
- **That** makes things more specific
 - picks a subset, modifies the meaning
- Comma before **which**, no comma before **that**.

In embedded systems, which have scarce resources, we...

In embedded systems that have scarce resources, we...

Feature selections that fulfill all constraints are valid.

Dependencies that cannot be expressed with X are called ...

Proof reading

- Let others have a look at your text
- Use a good spellchecker and grammar checker (MS Word finds many common problems)
- Especially for Latex users:
 - Convert your text to a word-file (e.g., latex2rtf)

Be precise

- is likely
- may

- can lead to large savings -> led to savings of 13-14% in our experiments.

- Avoid unnecessary modifiers
 - very slow
 - much more energy

Footnotes & Abbreviations

- Avoid footnotes
- Avoid abbreviations
 - Unless really common (SOA, UML, HTML)
 - Or used very often (>10) in the paper; define on first use
A Software Product Line (SPL) is a set of ...
 - For plural add an “s”, consider pronunciation ->
an SPL; several SPLs
 - do not use “e.g.”, “i.e.”, “etc”, “Fig.”, “Sec.” in main text (in brackets is ok)

Quotation Marks

- Use for quoting and irony only
- Do not use for emphasis, for using a word in an odd way, or when you are unsure about a word

He said “come on”. (quote)

His “honesty” was appreciated. (irony?)

Consider this “simple” solution... (irony?)

As a “gold standard”, we choose... (irony?)

The computer “decides” which course to take (irony?)

“Fresh” fish here! (irony?)

Articles

For Germans: Try to drop *the* and listen how it sounds. Plural usually does not require *the*

- **A** and **an** are indefinite articles. They refer to something not specifically known to the person you are communicating with.
- You use **the** when you know that the listener knows or can work out what particular person/thing you are talking about.
- You should also use **the** when you have already mentioned the thing you are talking about.
- We also use **the** before certain nouns when we know there is only one of a particular thing.
- We usually use no article to talk about things in general

I ate a banana for lunch.

- She's got two children; a girl and a boy. The girl's eight... -

Books are expensive.

Example

The conditional compilation with the preprocessors like `cpp` is simple but effective means to implement variability. By annotating the code fragments with `#ifdef` and `#endif` directives, different program variants with or without these annotated fragments can be created. Although, annotation-based approaches are frequently used in a practice, the researchers often criticize them for a negative effect on the code quality and maintainability. In contrast to modularized implementations such as components or aspects, the annotation-based implementations typically neglect a separation of concerns, can entirely obfuscate the source code, and are prone to introduce subtle errors.

Names are Important

- Check spelling of all names
- Most people are sensitive to misspelled names

Misc

- Use either British or US-English; do not mix
- e.g., and i.e., are always followed by a comma
- it is “Related work” and not “Related works”
- it is “Conclusion”, and not “Conclusions”
- don't use blurry figures (prefer vector graphics to bitmaps)