Lecture 10
Revisions

Prof. Dr. Jasmin Blanchette

Chair of Theoretical Computer Science and
Theorem Proving

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Drafting

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> If you remember only one thing from this book, please let it be this:
> revise the hell out of everything you write.
> —Kirsten Ghodsee, *From Notes to Narrative* (2016)

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You would not usually circulate this draft. Let it be your little **secret**.

Recycling vs. Rewriting

If you have written about a similar topic before, it may be tempting to reuse old text.
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It will be too short, too long, or written for a different audience.
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Use old text as inspiration, but **write new text**.

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Once your second draft is ready, circulate it among colleagues and friends to get their **feedback**.

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You can share the third draft with a **wider public**.

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Avoid **major changes** close to the final deadline.

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At some point, you prepare the final version of your document.
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Make sure you **thank** anyone who helped you.
In a peer-reviewed paper, you can even acknowledge the anonymous reviewers.

Compressing

Amputation vs. Haircut

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To meet a page limit, or to make your text sharper, **shorten** it.

There are two basic approaches, which can be combined:

- With the **amputation**, you remove entire sections, paragraphs, or sentences.
- With the **haircut**, you reword individual sentences or paragraphs.

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You can often omit the largely pointless outline at the end of the introduction of a paper (*This paper is structured as follows: . . .*).

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- Look for **needless words** and **metadiscourse**.
- Look for occurrences of two consecutive sentences that can be **merged** into one.
- Look for paragraphs ending with a **word alone** on their last line.
- Look for item lists and displayed equations that can be **inlined**.
- Look for mathematical proofs that can be shortened or given in **outline**.

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The abstract, introduction, background, conclusion, and any other **noncore** sections of a paper are prime candidates for a haircut.

Example of Haircut

Before (172 words):

> *In thread-based object-oriented languages, synchronous method calls usually provide the mechanism to transfer control from caller to callee, blocking the caller until the call is completed. This model of control flow is well-suited for sequential and tightly coupled systems but may be criticized in the concurrent and distributed setting, not only for unnecessary delays but also for the reasoning complexity of multithreaded programs. Concurrent objects propose an alternative to multithread concurrency for object-oriented languages, in which each object encapsulates a thread of control and communication between objects is asynchronous. Creol is a formally defined modeling language for concurrent objects which clearly separates intra-object scheduling from inter-object communication by means of interface encapsulation, asynchronous method calls, and internal processor release points. This separation of concerns provides a very clean model of concurrency which significantly simplifies reasoning for highly parallel and distributed object-oriented systems. This paper gives an example-driven introduction to these basic features of Creol and discusses how this separation of concerns influences analysis of Creol models.*[1]

[1] Einar Broch Johnsen, Jasmin Christian Blanchette, Marcel Kyas, and Olaf Owe, "Intra-Object versus Inter-Object: Concurrency and Reasoning in Creol," *Electronic Notes in Theoretical Computer Science* 243, pp. 89–103, 2009.

Example of Haircut

After haircut (131 words):

In thread-based object-oriented languages, control is usually transferred from caller to callee via synchronous method calls, which block the caller. This model is well suited for sequential and tightly coupled systems, but in concurrent and distributed settings, it causes needless delays and complicates reasoning about programs.

Concurrent objects are an alternative in which each object encapsulates a thread of control and objects communicate asynchronously. Creol is a formally defined modeling language for concurrent objects that cleanly separates intra-object scheduling from inter-object communication through interface encapsulation, asynchronous method calls, and internal processor release points. This separation of concerns greatly simplifies reasoning for highly parallel and distributed object-oriented systems. This paper introduces these Creol features with examples and discusses how the separation of concerns influences the analysis of Creol models.

. . . and of Amputation

After haircut and amputation (110 words):

> *In thread-based object-oriented languages, control is usually transferred from caller to callee via synchronous method calls, which block the caller. This model is well suited for sequential and tightly coupled systems, but in concurrent and distributed settings, it causes needless delays and complicates reasoning about programs.*
>
> *Concurrent objects are an alternative in which each object encapsulates a thread of control and objects communicate asynchronously. Creol is a formally defined modeling language for concurrent objects that cleanly separates intra-object scheduling from inter-object communication through interface encapsulation, asynchronous method calls, and internal processor release points. This separation of concerns greatly simplifies reasoning for highly parallel and distributed object-oriented systems.*

Example of Haircut

In thread-based object-oriented languages, synchronous method calls usually provide the mechanism to transfer control from caller to callee, blocking the caller until the call is completed.

VS.

In thread-based object-oriented languages, control is usually transferred from caller to callee via synchronous method calls, which block the caller.

Example of Haircut

This model of control flow is well-suited for sequential and tightly coupled systems but may be criticized in the concurrent and distributed setting, not only for unnecessary delays but also for the reasoning complexity of multithreaded programs.

VS.

This model is well suited for sequential and tightly coupled systems, but in concurrent and distributed settings, it causes needless delays and complicates reasoning about programs.

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Example of Haircut

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Creol is a formally defined modeling language for concurrent objects that cleanly separates intra-object scheduling from inter-object communication through interface encapsulation, asynchronous method calls, and internal processor release points.

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This separation of concerns provides a very clean model of concurrency which significantly simplifies reasoning for highly parallel and distributed object-oriented systems.

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This paper gives an example-driven introduction to these basic features of Creol and discusses how this separation of concerns influences the analysis of Creol models.

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Appendices and Technical Reports

Amputated text can be provided in **appendices** or in a **technical report**:

- With appendices, the material is **not in its natural location**.
  This is problematic for lemmas and proofs, which should precede their uses.
- A technical report, providing the **long version** of your document, is often preferable.

Conditional Compilation

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Conditional Compilation in Action

Let us analyze two research papers and their technical reports:

- Ahmed Bhayat and Giles Reger, "**A Combinator-Based Superposition Calculus for Higher-Order Logic**," *IJCAR 2020*, pp. 278–296, Springer, 2020.
- Alexander Bentkamp, Jasmin Blanchette, Sophie Tourret, Petar Vukmirović, and Uwe Waldmann, "**Superposition with Lambdas**," *CADE-27*, pp. 55–73, Springer, 2019.