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Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

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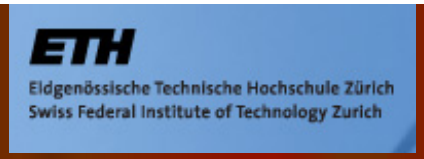
How To Give a good *Technical Talk*

Eiffel Software

ИТМО
ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ

Bertrand Meyer,
ETH Zürich & ITMO

Chair of Software Engineering



Welcome to my talk!

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The Plan Of My Talk

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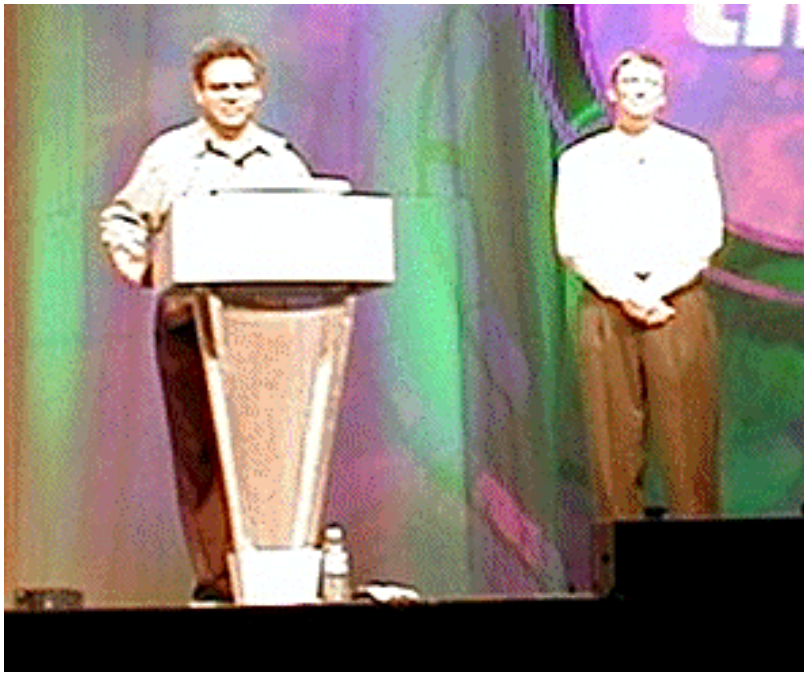
OK, let's try again, seriously this time!

Technically Speaking!

Bertrand Meyer
ETH Zürich

Why should you listen to me?

OK, I have given many talks
(and expect to continue)



More importantly, I have **attended** many more, good & bad!

The bad news

The key rule to giving an outstanding technical talk…

… is something I can't even begin to teach you in this presentation:

…Substance!

Form follows function

More bad news!

As to the rest…

not everyone has it by birth!

(or prior education)

The good news

You can learn.

Anyone can become a good technical speaker!

Talking about substance…

Integrity is essential

No need to be shy about your results, but don't over-represent:

- Never assert for a fact what you don't know to be one. (Conjectures, working hypotheses etc. OK if labeled as such)
- Never make a statement that you wouldn't be able to defend if questioned
- Do not use time limits as an excuse for dubious assertions

Do mention limitations, uncertainties and doubts on your results; this is the mark of the professional

Do not imply that you came up with an idea if it is from someone else; give credit.

- (But do not spend time acknowledging co-workers etc., this is for the paper. A single slide at the beginning or end is OK.)

Your key resource and enemy…

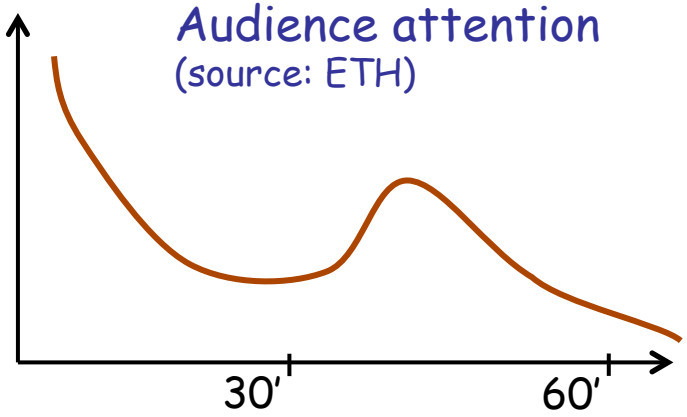
… is time.

You won't be able to say all you would like to

- The question is not whether to skip some of the material
- The question is what to skip

A standard way to structure your talk

- Start with a clear statement of the problem
- State your essential contribution **at the beginning**
- Then develop it
- Keep a surprise for the final part



- Conclude with a summary of results and openings for the future

The really basic basics

You want* to be understood!

- Structure your presentation
- Keep sentences short
- Talk loudly enough
- Sound enthusiastic
- Speak fast (but not too fast)
- Vary your voice

Use pauses for effect

** (We hope)*

Knowing your audience

Relate to your audience

Do a little research on your audience ahead of time
(but be prepared to adapt)

Know to walk the fine line between a little flattery and pandering

Managing time

Plan your talk shorter than required

- 2 minutes per slide
- Include time for questions, discussion

Skipping slides looks unprofessional

(but include extra slides at the end for expected questions)

Using too much time is rude

If you have stage fright…

You are neither the first nor the last.

There's nothing wrong with you! (Unless you do nothing about it)

Just think, learn and practice

You'll learn to turn your stage fright into an advantage

Involve the audience if you can

Ask a question

Not just a show of hands

Be prepared to handle the answer

But: be careful about the effect on time

Humor

One of your most potent weapons, but:

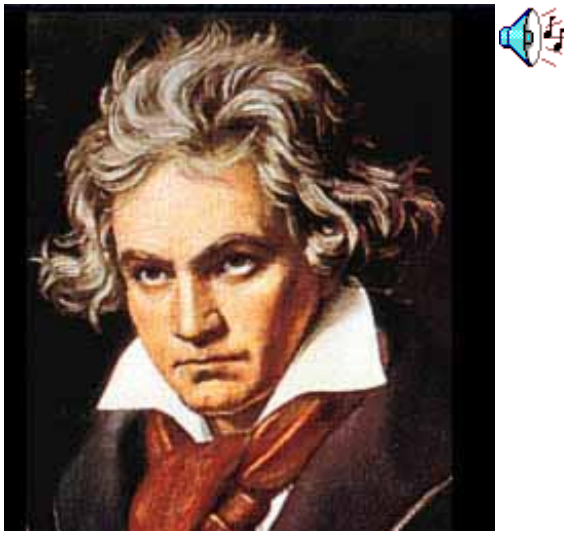
- An "opening joke" not related to the talk is always a bad idea
- Any humor should be related to the content
- If you don't have a natural sense of humor, don't force yourself — It will show
- Be careful of cultural differences

How not to start

- "Thanks for coming to my presentation"
- "I am really happy to be here"
- "You won't believe what Lufthansa did to my luggage!"
- "Buenas dias!" (unless you can continue in that vein…)
- "My advisor told me to give the talk for him, but I am not really prepared"
- "I only played a small role in this research, but all the others had exhausted their travel budget for this year, so here I am!"
- "I am not sure why the program committee accepted our paper, but here I am!"
- "As part of milestone 13.9 of the European Project 491162-B our group must to present three papers at middle-quality conferences (D-4 or below). This is number 3."

How to start

(See: Mozart and Beethoven)



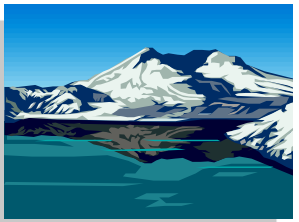
The Mathematics of Object Computation

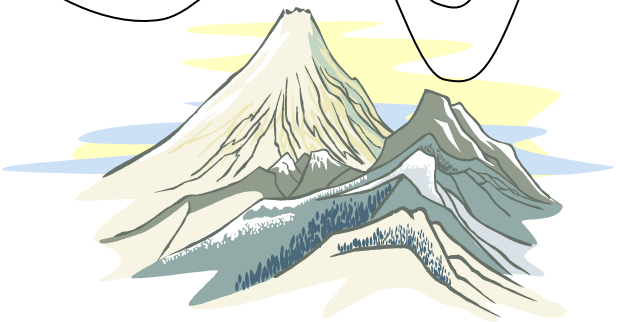
Bertrand Meyer

Preliminary material for LASER school, Elba, September 2004

Imagine…

… a world without cartesian product!





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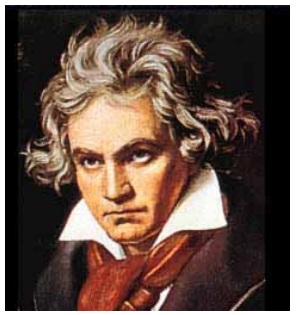
How not to end

- "Thank you"
- "Thank you for your attention"
- "I am now finished"
- "This was my conclusion"
- "I don't have any more time"

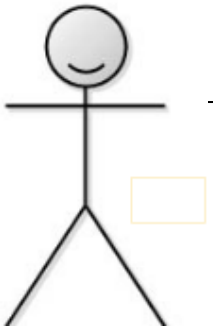


Here too, Beethoven got it right!

How to end

In applause

Slides



Key part of your talk

Diagrams and pictures should be clear & simple

Pictures should always illustrate the text; beware of Clip Art

Avoid acronym soup; expand acronyms the first time around

Only use completely clear abbreviations

For an important talk, slide preparation takes a long time; several hours for one slide is not an anomaly

Designing your slides

Use small number of (reasonable) fonts and colors

I strongly suggest dark on white for a technical CS talk: conveys clarity and simplicity.

Reserve light on dark for marketing presentations.

Any font or color change should support meaning

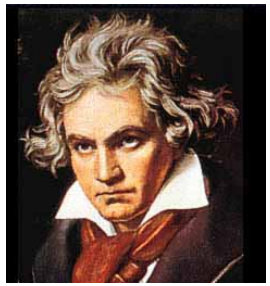
Forms follows function!

Font size and color

Size: 18 to 24 points (28 to 32 for titles, down to 16 for program text if you have to)

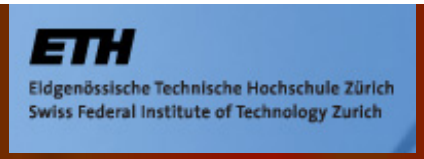
If you don't know the room, don't use bottom 1/3rd of screen

Never go below 16 with one exception:
OK to have small picture repeating a big picture of an earlier slide.



Watch your colors!

- Not all colors that look nice on your screen look nice with a projector



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Chair of Software Engineering

Twelve principles

Source: Agile manifesto

We follow these principles:

1. Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
2. Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
4. Business people and developers must work together daily throughout the project.
5. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
6. The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
7. Working software is the primary measure of progress.
8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
9. Continuous attention to technical excellence and good design enhances agility.
10. Simplicity— the art of maximizing the amount of work not done —is essential.
11. The best architectures, requirements, and designs emerge from self-organizing teams.
12. At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

Redundancy

Redundancy

What about testing?

Practice

Assertion

Assertion

Assertion

Wrong

Practice

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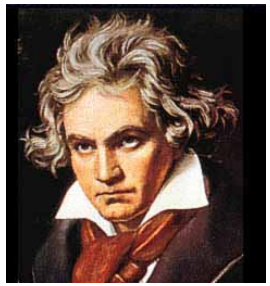

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More on slide design

Every slide should carry one central idea

That idea may be divided into at most a few points

("*The magical number seven, plus or minus two*")

Abbreviate: a slide is not an article, but text should still be understandable

- The talk must say more than the slides
- The slides may say *a little* more than the talk, to add some auxiliary information for the careful attendee
  - But usually not in teaching

Even more on slide design

Keep extraneous information to a minimum:

- Beyond the first page: affiliation, institution's logo etc. (are you recruiting?)
- Pictures, decorations unrelated to your content
- Dates, page numbers, …
- Punctuation

Forms follows function!

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Forms follows function!

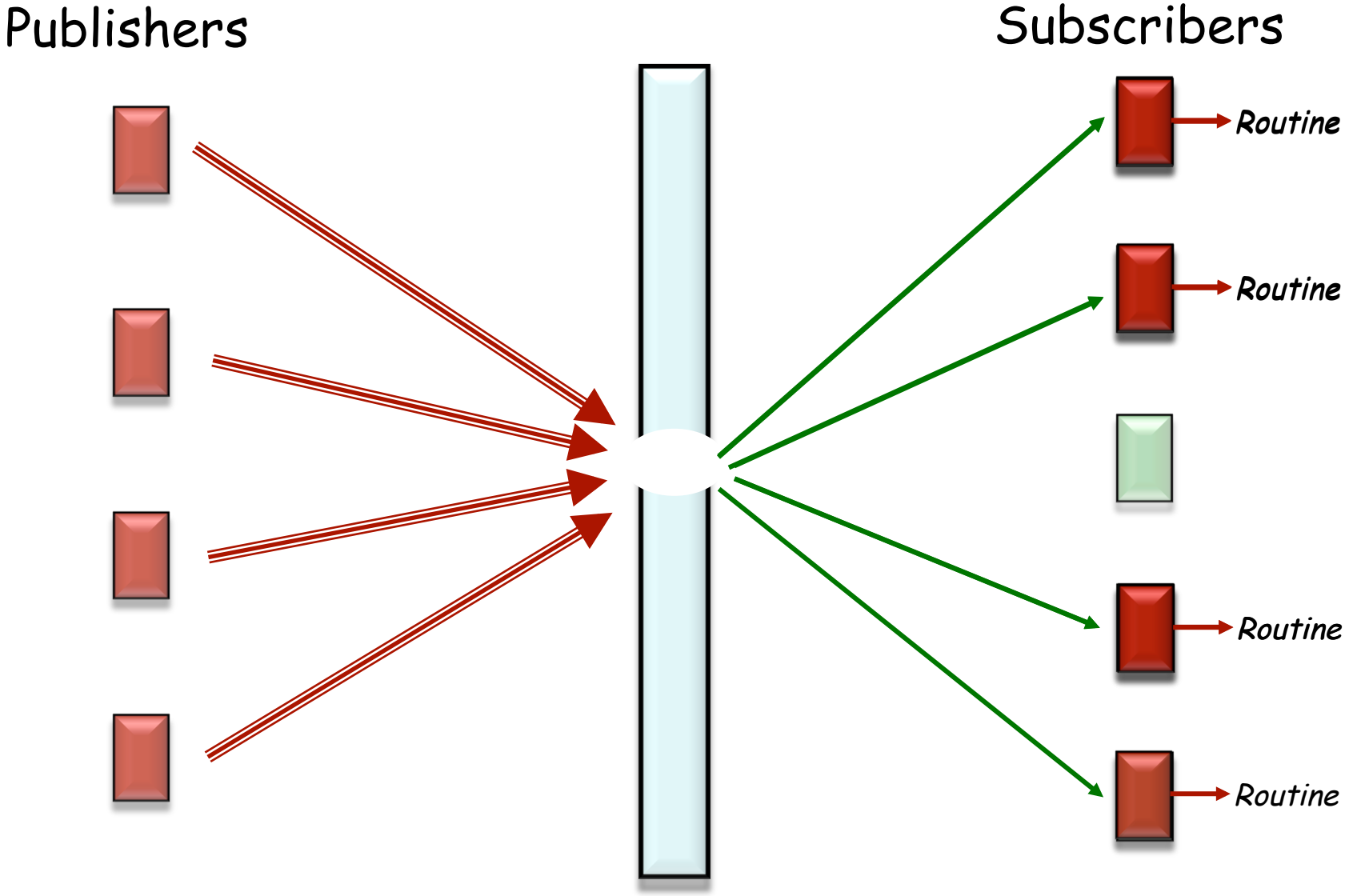
Taking advantage of technology

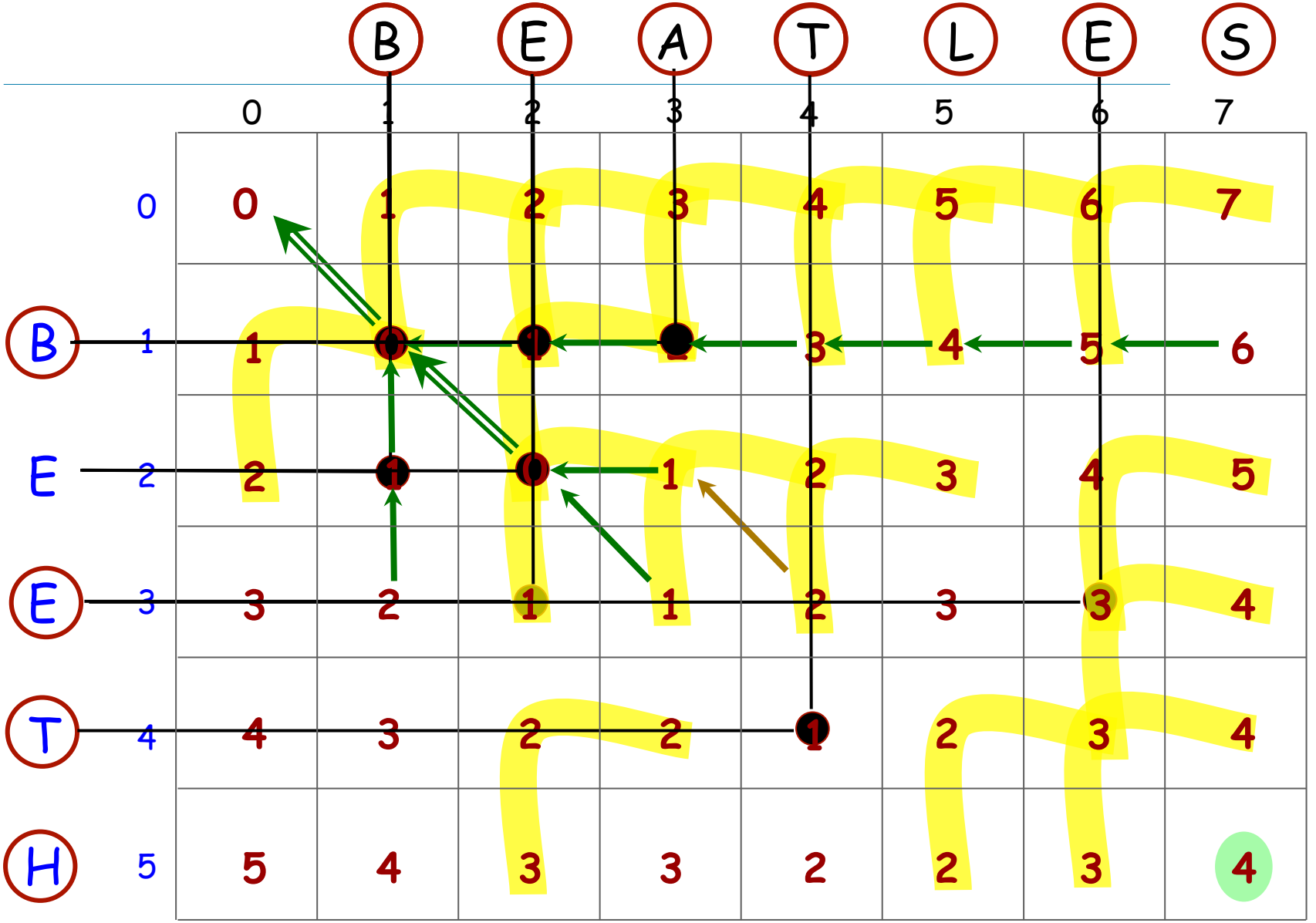
Don't succumb to "PowerPoint Paranoia", but

- Use pictures
- Use effects (moderately)
- Use animations

Remember: **Form follows function**

Event-driven programming

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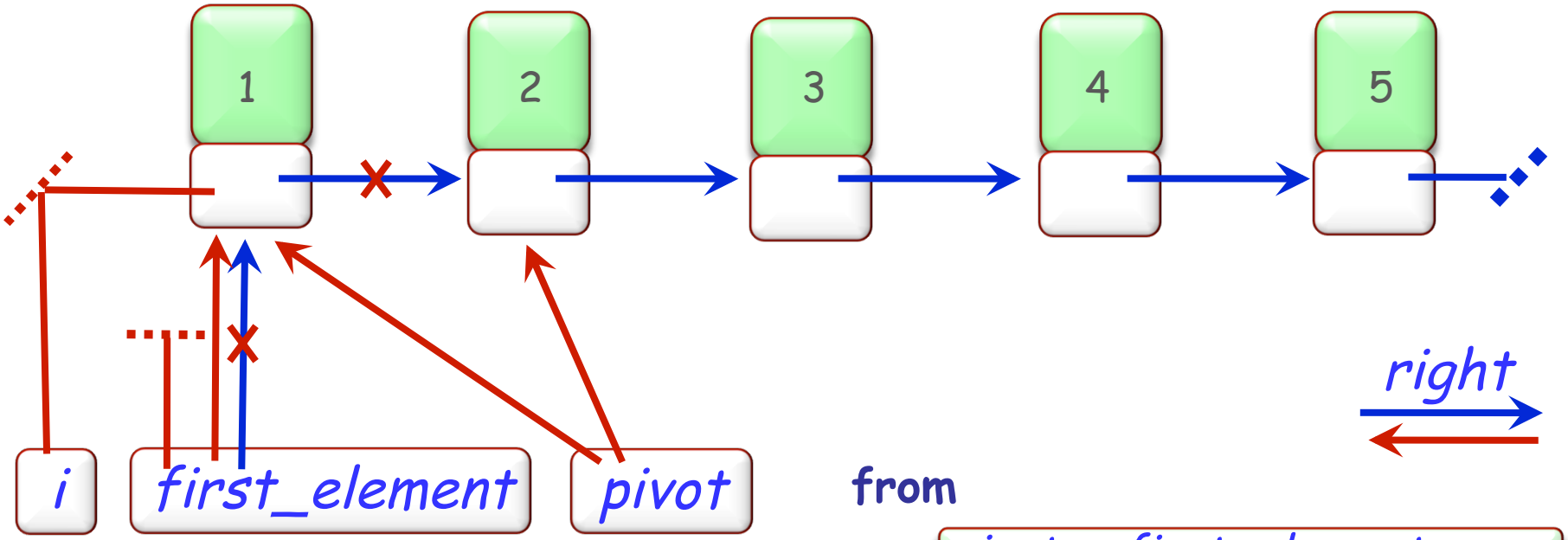
Reversing a list




```
from
        pivot := first_element
        first_element := Void
until  pivot = Void  loop
        i := first_element
        first_element := pivot
        pivot := pivot.right
        first_element.put_right (i)
end
```

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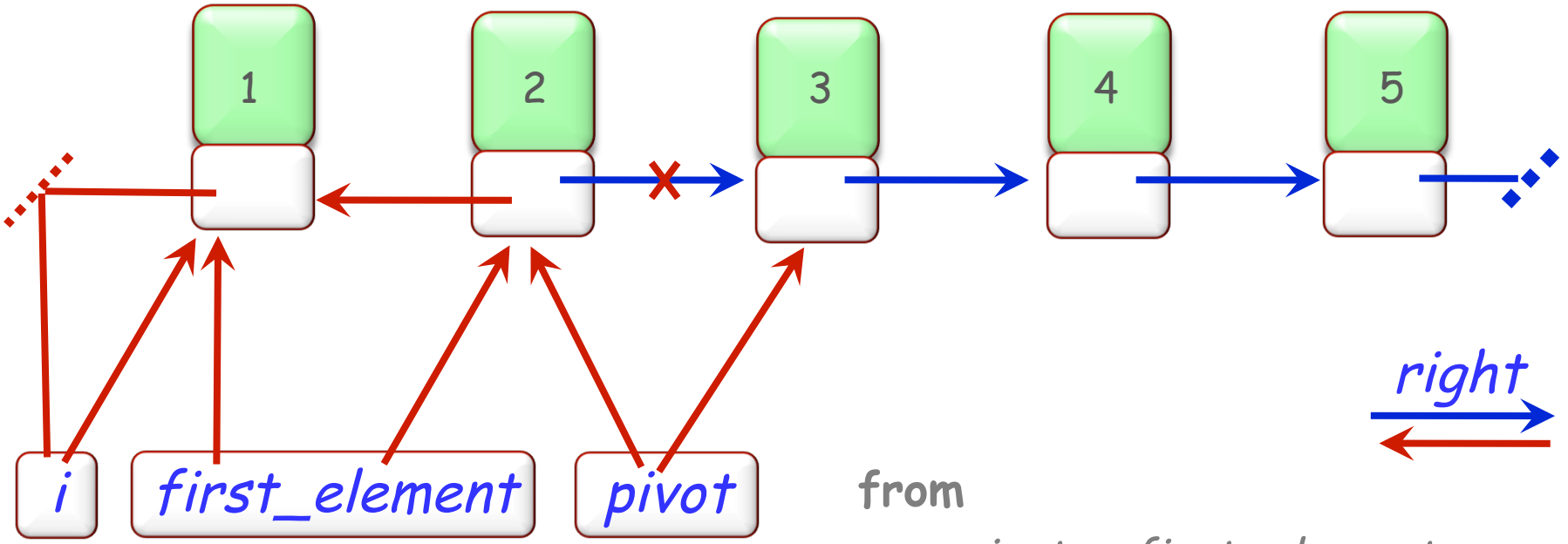


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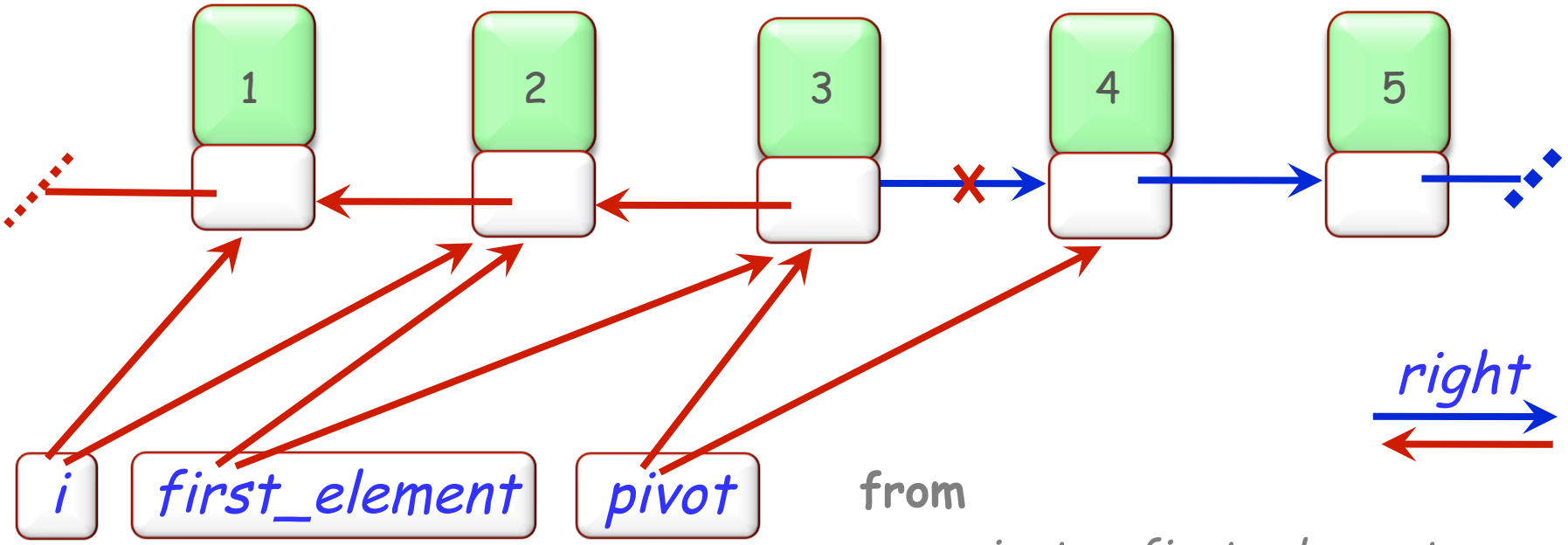


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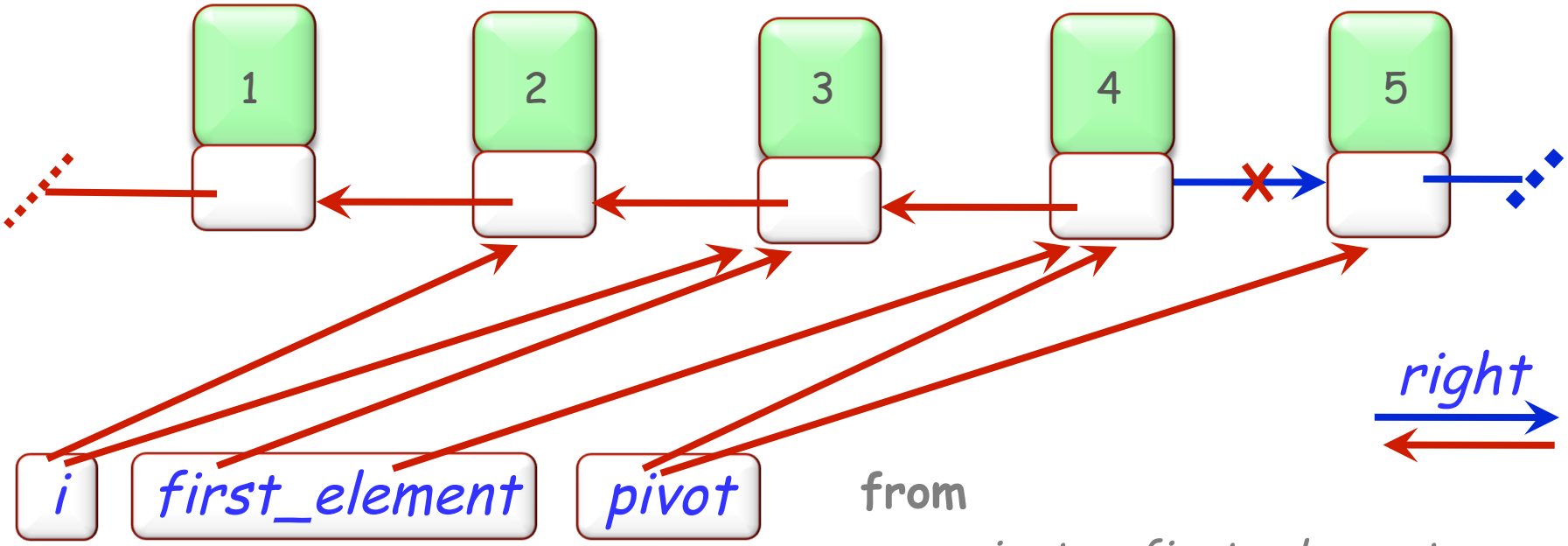


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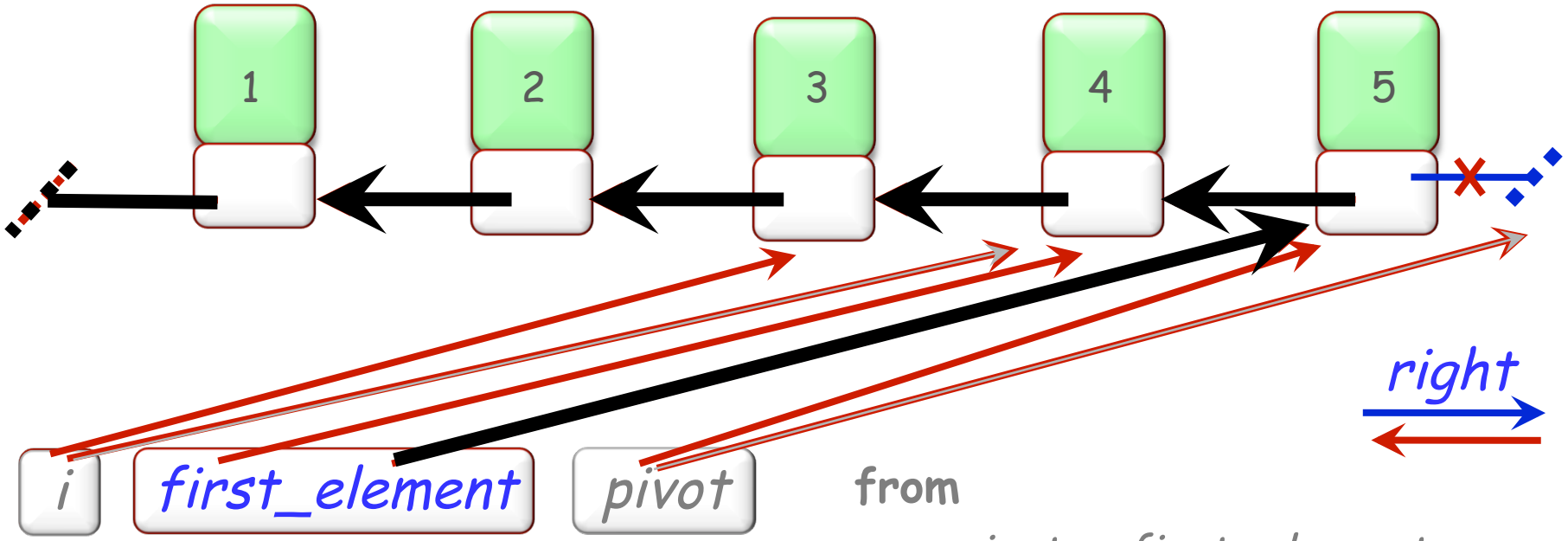


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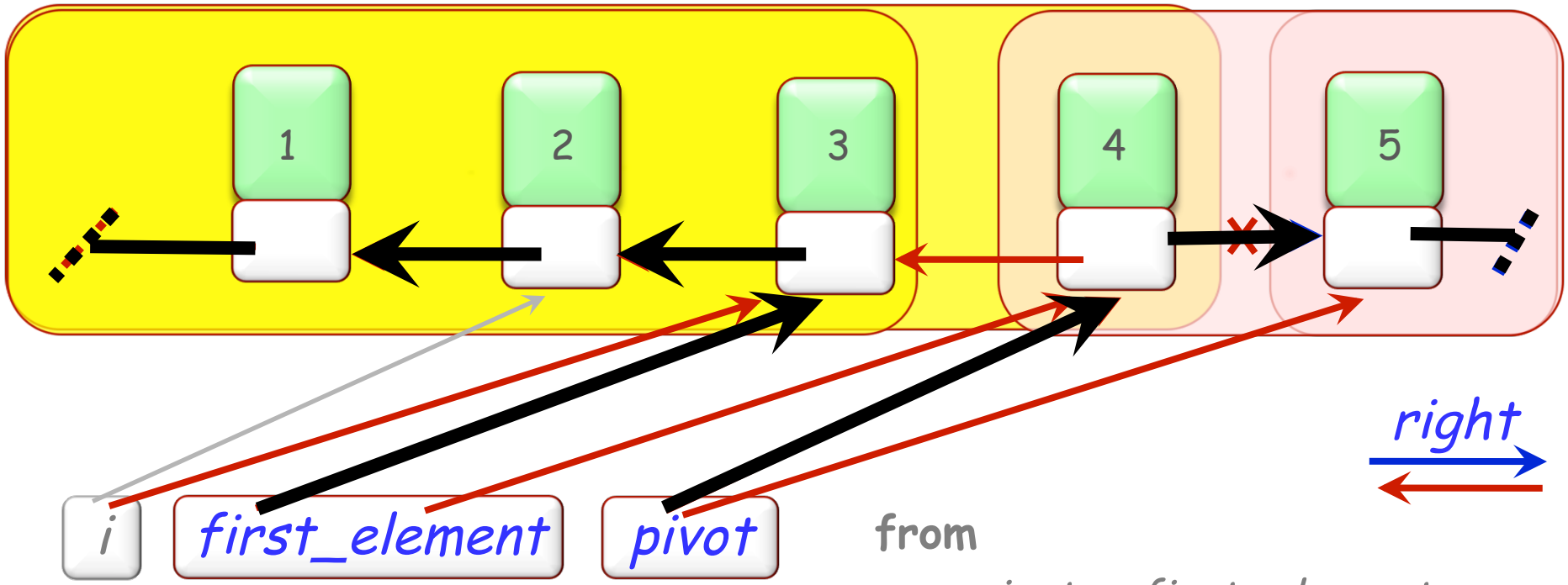
Why does it work?

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```

Invariant: from *first_element* following *right*, initial items in inverse order; from *pivot*, rest of items in original order

Some useful tools

Remote control

Laser pointer (or better the good old stick)

Tablet PC

Do not point with your hand or finger

A secret of the masters

Make the slides and the speech:

- Not redundant
- Not contradictory
- Complementary!

Practical tricks

Check the room in advance

Charge the battery, plug in your laptop (make sure you have the right adapters!)

Always carry a USB stick with your slides

Always have a secret URL at home with your slides
(*in addition* to the above)

Things *will* go wrong!

Demos

Prepare 5 times as much as for the rest

Use your own laptop

If you can't, always practice on the target machine (otherwise, do not demo)

Prepare a script; write it down if necessary. Stick to the script; don't try anything during the demo.

A demo that crashes or malfunctions kills the talk

Another secret of the masters…

Practice, practice, practice!

- Go through dry runs within your group
- Use your friends as guinea pigs
- Film yourself and force yourself to watch the movie
- Watch other presenters and learn from them, both the good and the bad
- Take advantage of resources, esp. Didaktikzentrum
- Get everything right. It's worth it.

Body language

Know your tics and get rid of them

Use gestures sparingly and to good effect

Form follows function

Effective speech

Listen to yourself, or watch a video

Know your tics, get rid of them (swinging, scratching, moving your limbs…)

Get rid of the "Uh". Most people initially have them; they are the mark of the **amateur**. Also, they aggravate a foreign accent!

Other symptoms: repeating words, interjecting "*you know!*", "*so*", "*then*", "*basically*" …

Be aware of these and eradicate them!

Clichés to avoid

Last but not least

Each and every

Rules and regulations

"Without further ado…"

Common non-native speakers' English mistakes

I am a PhD student since 6 months	I *have been* a PhD student *for* 6 months
Last not least	Last *but* not least
This runs quick, that went good	This runs *quickly*, that went *well*
This technique allows to solve the problem	This technique allows *us* (or: *makes it possible*) to solve the problem (or just: this technique *solves* the problem)

Distinguish these

Premier	/	Première
Principle	/	Principal

Pronounce these:

Undermine

Acyclic

Determine

Cyclic

Expertise

Alias

Realize

Occur

Guard

Integer

Parameter

Variable

Transaction

Infinite

Cooperate

Finite

Ghoti

(George Bernard Shaw)

Complete:

What is the criteri…

There are a number of criteri…

The bottom line

If you made it to this stage, you have what it takes to give an excellent speech

You've done the smartest part: the content. Now you have to do the groundwork

With confidence and dedication, and reliance on your own intelligence and resources,

Form **will** follow function