

Scientific Presentation

Part 1 of Lecture Series Scientific Working

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Target Audience

You are currently doing ...

- ... a Master's Thesis
 - How to present your results?
- ... a Seminar-Style Course
 - How to present a summary/literature review/assessment?
- ... a Project Lab
 - How to present a Project Plan and finally your results?

Beyond: Ability to present is essential for almost any type of career!

A good presentation ...

A good presentation ...

- ... helps the audience to memorize contents
→ Memory Process
- ... makes the context clear and highlights most important information
→ Structure & Contents
- ... explains complex contents
→ Contents
- ... has appealing slides that support structure in the contents
→ Layout & Style
- ... is professional in presentation
→ Presenting

Happy Audience
→ Nice Grades

- Why Presentation Techniques?
- **Memory Process**
- Structure & Contents
- Layout & Style
- Presenting

Memory Rate

After 3 Minutes

Capacity for new information decreases

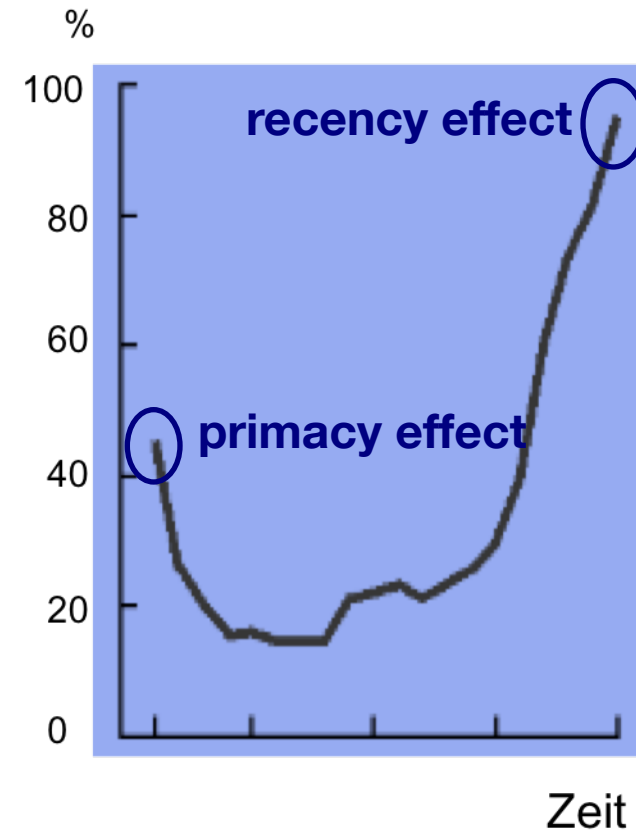
Middle Part

Audience decides on

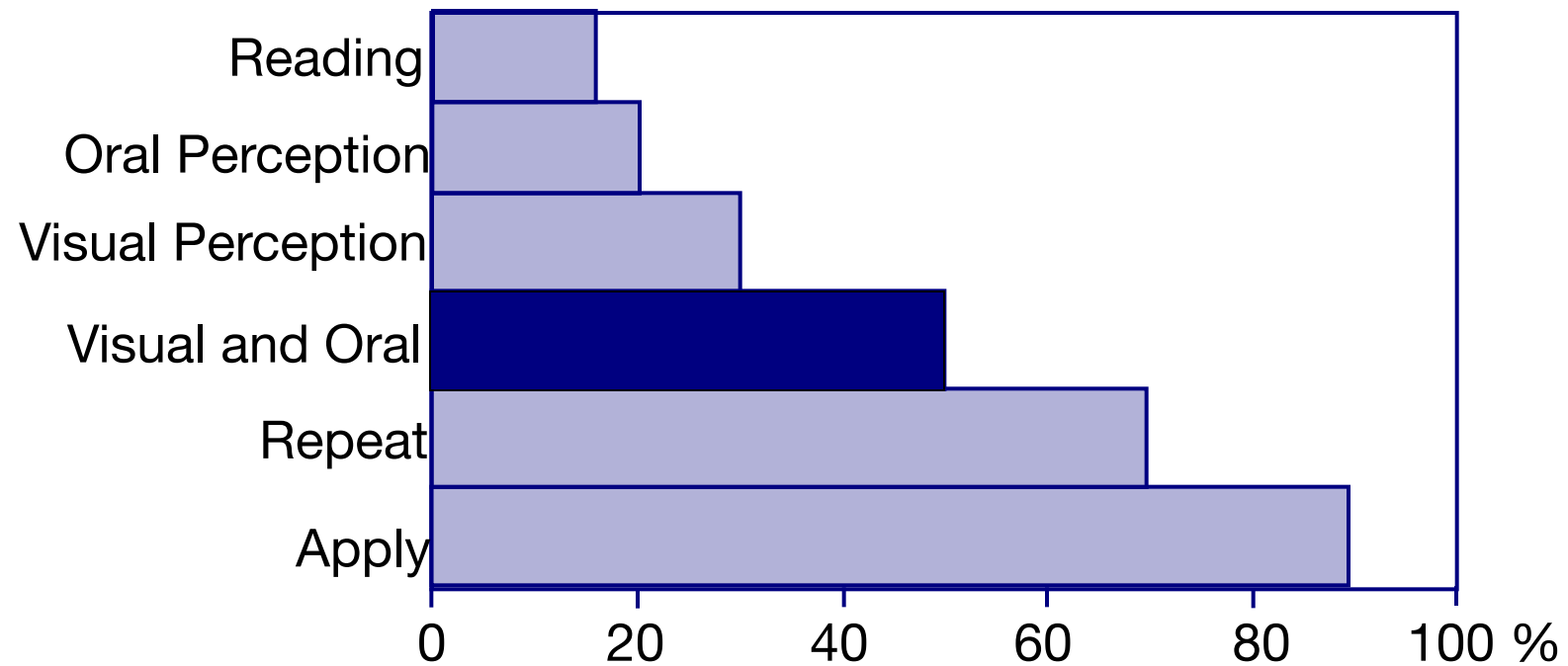
- Competence
- Sovereignty
- Quality of contents

Finish

Highest probability of storage



Memory Rate



[Johannes,1999]

The audience forgets

50 %

of what you say!

Improving Memory Rate

Active participation (repeat & apply) of audience!

- Rhetoric questions
- Ask for interposed questions
- Allow discussion

- Why Presentation Techniques?
- Memory Process
- **Structure & Contents**
- Layout & Style
- Presenting

Preliminary Thoughts on Contents

- Previous knowledge of the audience
- Expectation of the audience

E.g. Thesis:

- Design talk for your fellow students
- Show that you did **a lot of difficult** stuff
- Show that you gained in depth understanding
- But nevertheless: **do not loose the audience!**

E.g. Seminar

- Design talk for other participants
- Select appropriate material from the papers you present about
- Not too shallow: show that you gained in depth understanding
- But nevertheless: **do not loose the audience!**



Outline

① Welcome

② Introduction / Motivation

③ Overview

④ Methods & Results

⑤ Summary

⑥ Discussion

Prepare slides for this part!

① Welcome

- Welcome chair and audience
- Introduce yourself (if not already done by chair)

② Introduction/Motivation

- Orientation
- Purpose/Problem Statement
 - what is the problem, how is it approached in literature, what is not yet solved, how is the problem approached in the following
 - Seminar about one single paper: do not forget to introduce the paper even before (author, title, journal, year, how well received).

Do not hurry here! A clear problem statement is essential!

③ Overview

- Outline of presentation
- Outline after problem statement allows for more information in outline

④ Main Part

- More formal problem statement
- Preparation for main result (if contents from other sources: give reference)
- Main result (select suitable parts of work; usually in depths presentation of one/some main result, more coarse presentation of other results)
- Examples, Applications
- Discussion (here you add your own opinion!)

⑤ Summary and Conclusion

- Key results
- Open questions and possible future research
- Conclusion

Discussion

- ## ⑥
- Questions and recommendations of audience

Recommendations for Contents of Slides (1)

Slides are an illustrated summary of your report!

Reading only: comprehension of main contribution

Listening in addition: improves comprehension

Each of the slides is a unit and has a message!

Appropriate heading?

Use layout to highlight main message and to visualize structure

Recommendations for Contents of Slides (2)

Figures help a lot to explain difficult concepts!

Either ...

- ... use figures from papers (with reference)
- ... redraw figures from papers (with reference)
- ... draw your own figures (preferred 😊)

Equations need to be introduced in detail!

Introduce all variables/symbols,
maybe colors to structure equation?

Major challenge: Audience has to be able to follow, but nevertheless do not oversimplify



Scientific Transparency

Clarity needed: what is yours, what is from other sources -> indicate on slides

Example Seminar:

make a difference between your introduction/your discussion
and the paper's introduction/the paper's discussion

Clarity needed: what is a fact, what is an opinion -> Results versus Discussion

- Why Presentation Techniques?
- Memory Process
- Structure & Contents
- **Layout & Style**
- Presentation

Slide Layout

To structure a slide you can use:

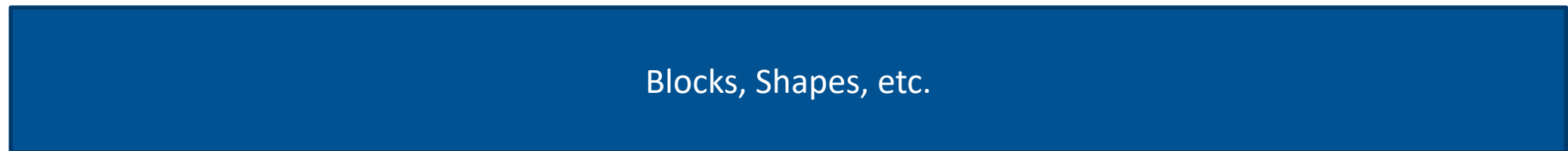
Boldface , Underline, **Colors**, Different Font Sizes

- Enumeration Item 1
- Enumeration Item 2

| | | |
|--------|--|--|
| Tables | | |
| | | |

Columns: First column

Second column



Slide Layout

Your slides should not look like this!

- This is an example for a slide with too much text.
- Avoid to have long sentences and text paragraphs, keywords are better.
- Too many nested enumerations are confusing.
 - The audience is **busy with reading the text** and not **listening any more to your speech.**
 - Figures are much better for illustration
 - You will also start reading the slides instead of giving a free speech
- Too many font sizes, font styles, underlines, colors lead to CHAOS on your slide.

“Less is more”

- Do not overload slides
- Keywords and short sentences
- Max. 2 levels in bullet lists
- Max. 3 font sizes / 3 colors
- Frugal use of text emphases
- Only sans-serif fonts
- Comfortable contrast

Better 2 sparse slides than 1 overloaded!

... but only itemize is mostly also not appropriate

Example for inappropriate use of itemize:

- Idea for the approach is ...
- The approach has two sub-modules
- Submodul 1 is ...
- Submodul 2 is ...
- A consequence is that approach is ...
- A major strength of the approach is ...

... but only itemize is mostly also not appropriate

Example for inappropriate use of itemize:

- Idea for the approach is ...
- The approach has two sub-modules
- Submodul 1 is ...
- Submodul 2 is ...
- A consequence is that approach is ...
- A major strength of the approach is ...

Maybe better like that:

Idea: ...

Two sub-modules

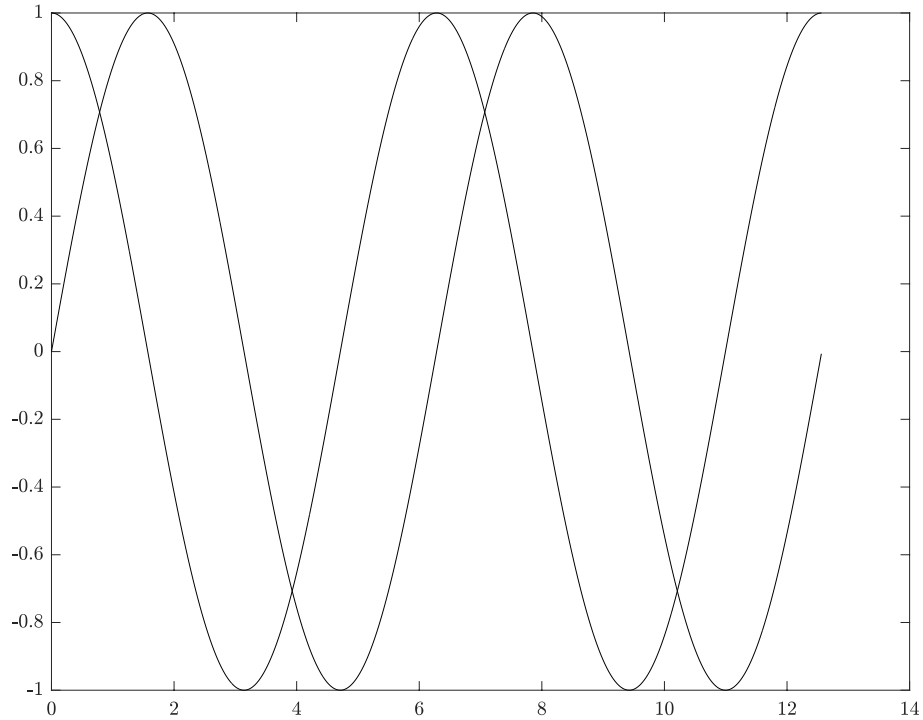
- Submodul 1: ...
- Submodul 2: ...



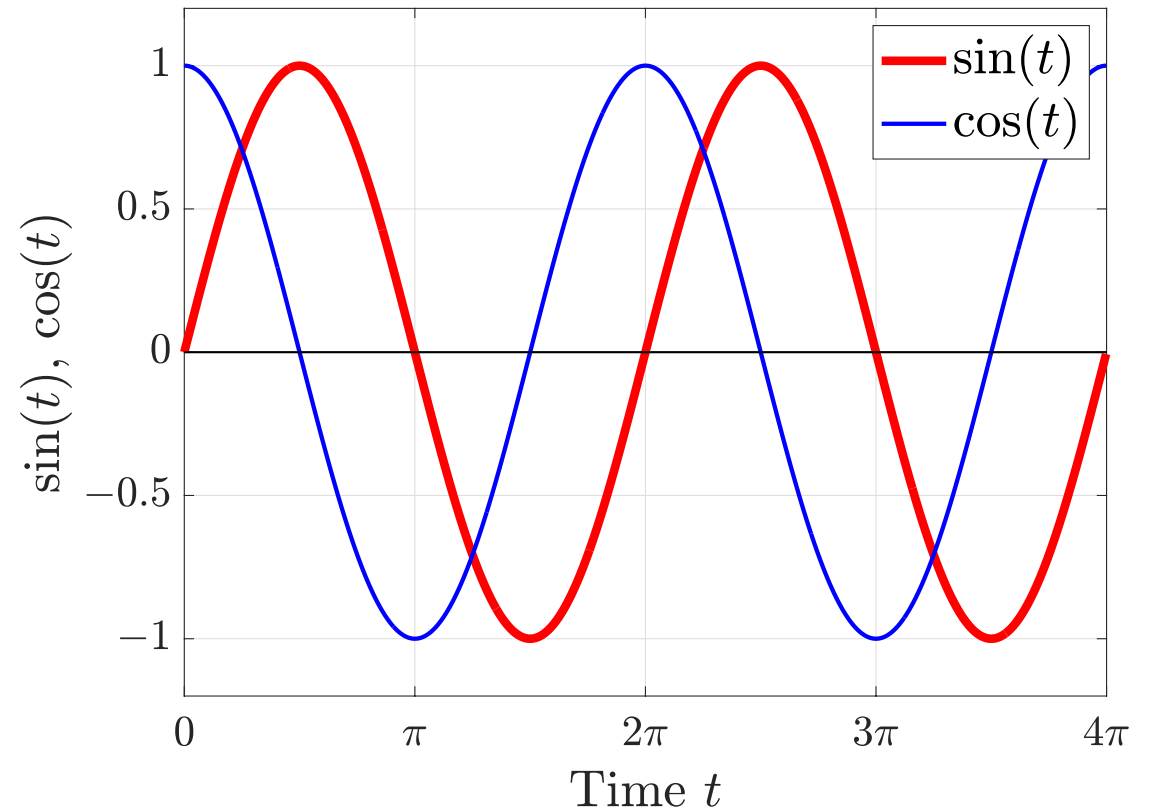
Modular Design!

Major strength: ...

What figure do you prefer?



Trigonometric Functions



Font Sizes

- Normal font size level 1: 26pt
- Normal font size level 2: 24pt
- Normal font size level 3: 20pt
- Stay with 20pt in further levels
- 18pt if really necessary
- This is 16pt
- This is 14pt
- 12pt is really tiny

Video, Sound, Animation, Effects ...

- Only if necessary and helpful for comprehension!
- No slide transitions

- Why Presentation Techniques?
- Memory Process
- Structure & Contents
- Layout & Style
- **Presentation**

Practice the Presentation!

- Free speech
- Speak slowly and clearly
- Timing

- First: Practice alone
- Later: Practice with friends/colleagues
- Or: Make a video and watch yourself

Structure

Structure your speech by

- Slide Layout

- In addition: verbally

„I summarize ...”

„I will answer two questions now ...”

„That’s all for the methods, let’s come to the results ...”

„What is the next step?”

Clarity

Explain such that whole audience understands your key contribution!

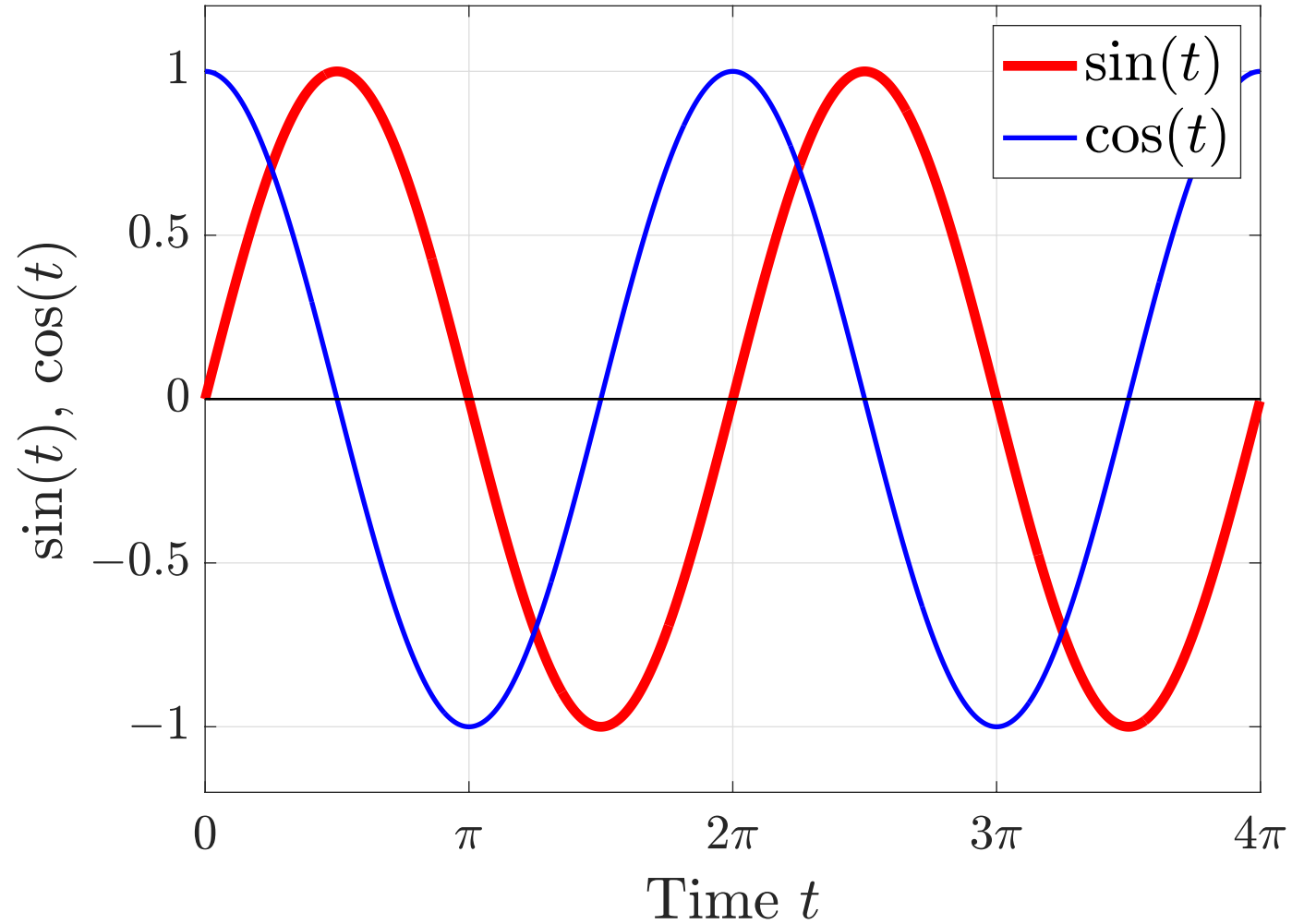
- Thorough Introduction/Motivation/Problem Statement
- Also give a „version for dummies“ of complicated concepts
- Keep central theme in mind (roter Faden)

- Go through all the text/figures of the slides
- Explain equations in detail (output, input, variables, constants...)
- Explain figures in detail (axes, legend,)



Practicing how to discuss a figure ...

Trigonometric Functions



Questions, Recommendations

- Listen carefully, wait until question is finished
- Positive reaction
- If necessary to clarify, repeat question in own words
- Give concise and objective answer
- Do not wander from the subject
- Thank for helpful recommendations



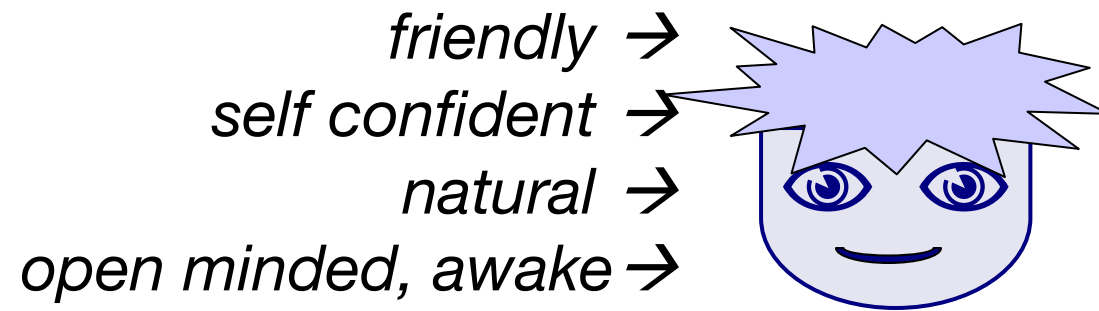
Style: Language

- Simple and short sentences
- Avoid passive formulations
- Avoid unnecessary technical terms and abbreviations

Style: Voice

- Avoid high pitch, vary intonation
 - Natural speech melody
- Appropriate volume
- Clear pronunciation
- take a breath (without “ähm”/ “mmh”)

Style: Body Language - Face



Eye contact with audience!

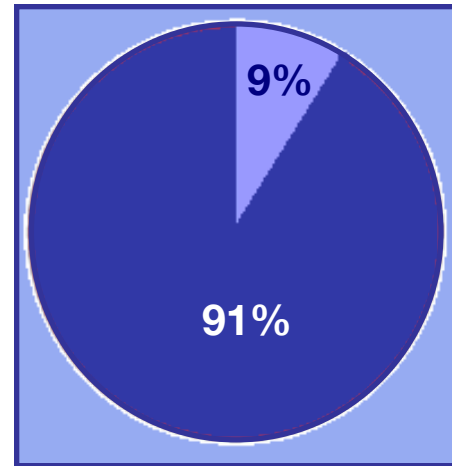
Style: Body Language - Posture

- Stand on both legs
- Control your gesture
- Turn to the audience
- Use (Laser) Pointer

Besides: dress adequately

Stage Fright

Only 9% do never have stage fright



[Allhoff ,1998]



„The human brain starts working the moment you are born and never stops until you stand up to speak in public“

[Mark Twain]

Stage Fright

Preparation

- Prepare notes
- Learn opening by heart
- Train difficult passages more often
- Practice a lot!



On-Site

- Check room and technical equipment in advance

Blackout

- Summarize what you have just said
- Repeat what you have just said
- Go to next part

→ Admit that you got lost

Checklist for Presenter



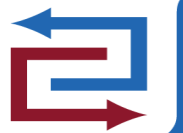
| Checklist for Presenter Part 1 - Structure of Presentation | | Yes/No | | | | | | | | | | | | | | | | | | | | | | |
|--|--|------------------------|---------|---------------------------|--|----------|---|-------------------------------|--|--|--|---|--|-------------------------|--|-----------------------------------|--|------------------------------------|--|----------------------|--|--------------|-----|--|
| Is the number of slides appropriate? (ideally 20 minutes <= 20 slides) | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>Analyze your structure</th> <th>#Slides</th> </tr> </thead> <tbody> <tr> <td>Introduction / Motivation</td> <td></td> </tr> <tr> <td>Overview</td> <td>1</td> </tr> <tr> <td>Main Part – Problem statement</td> <td></td> </tr> <tr> <td>Main-Part – Comparison to state-of-the-art</td> <td></td> </tr> <tr> <td>Main Part – Preparation for main result</td> <td></td> </tr> <tr> <td>Main Part – Main Result</td> <td></td> </tr> <tr> <td>Main Part – Example / Application</td> <td></td> </tr> <tr> <td>Main Part – Discussion /Assessment</td> <td></td> </tr> <tr> <td>Summary / Conclusion</td> <td></td> </tr> <tr> <td>Bibliography</td> <td>1-2</td> </tr> </tbody> </table> | Analyze your structure | #Slides | Introduction / Motivation | | Overview | 1 | Main Part – Problem statement | | Main-Part – Comparison to state-of-the-art | | Main Part – Preparation for main result | | Main Part – Main Result | | Main Part – Example / Application | | Main Part – Discussion /Assessment | | Summary / Conclusion | | Bibliography | 1-2 | |
| Analyze your structure | #Slides | | | | | | | | | | | | | | | | | | | | | | | |
| Introduction / Motivation | | | | | | | | | | | | | | | | | | | | | | | | |
| Overview | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| Main Part – Problem statement | | | | | | | | | | | | | | | | | | | | | | | | |
| Main-Part – Comparison to state-of-the-art | | | | | | | | | | | | | | | | | | | | | | | | |
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| Summary / Conclusion | | | | | | | | | | | | | | | | | | | | | | | | |
| Bibliography | 1-2 | | | | | | | | | | | | | | | | | | | | | | | |
| Is the presentation complete? | | | | | | | | | | | | | | | | | | | | | | | | |
| Do footers of the slides reflect the structure? | | | | | | | | | | | | | | | | | | | | | | | | |
| Are headings appropriate? | | | | | | | | | | | | | | | | | | | | | | | | |

| Checklist 2: Contents of Presentation | Yes/No |
|--|---------------|
| Does every slide have a main message? | |
| Is this main message somehow highlighted? | |
| Is the heading appropriate for the content? | |
| | |
| Is the problem statement entirely clear? | |
| Is there enough illustration by videos and figures? | |
| Are there enough and appropriate examples? | |
| Are difficult things explained well enough? | |
| Are contents arranged in a logical and consistent order? | |
| | |
| Are all symbols introduced? | |
| Are all technical terms and abbreviations/acronyms introduced? | |
| Is the spelling correct? | |

| Checklist 3: Layout & Style of Slides | Yes/No |
|---|---------------|
| Text: | |
| Is the selection of the fonts appropriate (only fonts from template allowed!) | |
| Are font sizes appropriate (only 2-3 sizes allowed throughout all slides) | |
| Are there still overloaded/messy slides? | |
| Is layout exploited to emphasize the structure? | |
| | |
| Figures: | |
| Are all lines thick enough? | |
| Are marker sizes appropriate? | |
| Are colors well distinguishable and logically chosen? | |
| Are axis labels complete (appropriate text, units)? | |
| Are font and font size of text / equations appropriate? | |

| Checklist 4: Oral Presentation | Yes/No |
|--|---------------|
| Do I turn to the audience? | |
| Do I look into faces? | |
| Is my body language appropriate? | |
| | |
| Is my voice loud enough / not too loud? | |
| Is the talking speed appropriate? | |
| Is my language clear and simple enough? | |
| Do I avoid to use fill words that are annoying? | |
| Do I memorize my narrative enough to have a fluent presentation? | |
| | |
| Do I spend enough time on each slide? | |
| Do I explain all equations and figures slow enough? | |
| Do I use expressions that structure the presentation? | |

Checklist for Audience



Checklist for Audience

Evaluate from 1 (poor)
to 10 (excellent)

Clarity of Contents:

How clear is the problem statement?

How clear are the main results of the paper presented?

How well is the difference between material from the paper and own assessment communicated?

Layout:

How appealing is the layout and to what extent does it support the structure of the contents?

Oral Presentation:

How well is free speech realized and how appropriate is the body language?

What are your recommendations for improvements?

Conclusion

Slides/Minute?

All the best for your presentation

Bad!

References

- C. Wickens and J. Hollands. *Engineering psychology and human performance*. Prentice-Hall Inc., Upper Saddle River, New Jersey, 2000.
- R. A. Ruddle, J. C. Savage, and D. M. Jones. Symmetric and asymmetric action integration during cooperative object manipulation in virtual environments. *ACM Transactions on Computer-Human Interaction*, 9(4):285–308, 2002.

Good!