

# Hauptseminar Computer Graphics and Visualization

*Advanced Seminar*

## Physically-based Rendering and Simulation

Scientific Writing

APB E009 / 02<sup>nd</sup> May 2024 / 2. DS



Computer Graphics  
and Visualization

# Agenda

- Organization
- Timeline of the Seminar
- Structure of a Scientific Report
- Literature Review
- Avoiding Plagiarism
- Additional Tips
- Useful Resources

# Organization

- Teams are set
- Some emails missing! (Team of Fluid Simulation)
- Supervisors are assigned. Please make an appointment with your supervisor.

# Organization

- **Solutions to the rendering equation**  
Team: Frode Meier  
Supervisor: David Groß [david.gross1@tu-dresden.de](mailto:david.gross1@tu-dresden.de)
- **Advanced light transport effects**  
Team: Andrei Salov, Timur Gildeev, Bulat Fakhrutdinov  
Supervisor: David Groß [david.gross1@tu-dresden.de](mailto:david.gross1@tu-dresden.de)
- **Real-time global illumination**  
Team: Alibek Kabuldinov, Youwei Hui, Thomas M. Kühn  
Supervisor: Mario Henze [mario.henze@tu-dresden.de](mailto:mario.henze@tu-dresden.de)
- **Radiance Fields**  
Team: Pareel Amre, Ching-En Kuo, Minjiang Lin  
Supervisor: Lennart Woidtke [lennart.woidtke@tu-dresden.de](mailto:lennart.woidtke@tu-dresden.de)
- **Rigid Bodies**  
Team: Jan Biedermann  
Supervisor: Sebastian Vogt [sebastian.vogt1@tu-dresden.de](mailto:sebastian.vogt1@tu-dresden.de)
- **Cloth Simulation**  
Team: Anna Wang, Yunhan Hao, Yichao Sheng  
Supervisor: Kristijan Bartol [kristijan.bartol@tu-dresden.de](mailto:kristijan.bartol@tu-dresden.de)
- **Fluid Simulation**  
Team: Akshay Singh Yadav, Dominik Maier, Leon Georgi  
Supervisor: David Groß [david.gross1@tu-dresden.de](mailto:david.gross1@tu-dresden.de)
- **Machine learning in simulation**  
Team: Song Bai, Ranim Zarour, Sepideh Ghorbanian, Man Ho Tsui  
Supervisor: Julien Fischer [julien.fischer@tu-dresden.de](mailto:julien.fischer@tu-dresden.de)

# Next Milestones

- 1 page draft: Deadline 16.05, 23:59 (11:59 p.m.)  
Send via email to your supervisor!
- Final report: Deadline 20.06, 23:59 (11:59 p.m.)
- Final presentation: Mid to end of July (dates to be decided)

# Scientific Report

- Scientific papers must be written with utmost clarity and conciseness.
- Fluency in English is crucial in scientific writing.
- Non-native speakers should consider getting their work proofread by a native speaker.

# Scientific Report

- (1) Abstract
- (2) Introduction
- (3) Literature Review
- (4) Methods
- (5) Results
- (6) Discussion and Conclusion
- (7) References

## Note:

- **(4) and (5):** study and write about the existing methods and their results.
- **(6):** will show how well you understood (4) and (5). Could be included with (5).

# Abstract

- Presents a brief version of the study for the reader. The abstract should include:
  - (1) Stating the problem
  - (2) Explaining your approach
  - (3) Presenting the solution
  - (4) Highlighting the significance of the results
- Readers often only read the abstract to make first impression.
- Should be written carefully and concisely to make a strong impact.
- Although it appears first, most scientists write the abstract last.
- The abstract should be comprehensive but not duplicate the content in the paper.



# Introduction

- Critical section that can make or break your scientific report.
- Should answer: Why the study is of scientific interest and what the objectives are?
- Should transition from general information to specific details about the study.
- Should summarize the background succinctly.
- Only studies that relate directly to the topic should be discussed.
- Last sentences of the introduction should state objectives.

# Introduction

The [Stanford InfoLab](#)'s patented five-point structure for Introductions. Each point as a separate paragraph.

- (1) Stating the problem.
- (2) Explaining why its interesting and important.
- (3) Discussing why it's hard to solve.
- (4) Highlighting what's wrong with previous solutions.
- (5) Outlining key components of the approach and results.

# Tips: Abstract and Introduction

- Abstract and Introduction sections are the challenging sections of a scientific paper.
- Don't aim for perfection because these sections will require significant modifications.
- Scientists often write them last to carefully balance general context and specific focus.
- These sections of the paper are all that many people will read.
- Must get your message across in direct, crisp, and enticing manner.

# How to perform Literature Review

- A structured literature review efficiently summarizes prior work on the topic.
- Create a note with possible keywords in your topic.
- Evidences may be found in books, journals, research articles, review papers etc.
- Stay focused on the given topic to find relevant papers.
- Who are the popular researchers in the field?
- Search for references through bibliographic databases. Example: [Google Scholar](#)

# How to perform Literature Review

- **Primary source:** studies written by the researchers who conducted them.
- **Secondary source:** studies prepared by someone other than the original researcher.

## The four pillars of a literature review:

1. Question
2. Gather
3. Analyze
4. Summarize

# How to perform Literature Review

- **Ancestry approach:** involves using citations from current studies to locate previous research that informed those studies.
- **Descendancy approach:** involves starting with an influential earlier study and tracking forward through citation indexes to identify more recent research.
- **Review papers:** identify significant works discussed in the review paper, and take notes.

# Tips: How to perform Literature Review

- Keep a record of search strategies in your notebook and search results in databases such as <https://www.zotero.org/>.
- Evaluate study quality and draw overall conclusions.
- Critiques of literature reviews often focus on methodology.
- Answer the broad question: How much do the findings reflect the truth?

# Method

- This section provides all the technical details necessary to understand the approach.
- Presents a narrative of the steps performed to obtain the results.
- Choose which technical information to detail carefully.
- Experimental details **do not** constitute a method section.
- Show only methods of important papers during the seminar and in final report.



# Results

- Present experiment results and choose relevant information to summarize in text, tables, or figures.
- Always direct readers to tables or figures to view data.
- Show results from relevant papers.

# Discussion

- Interpret and compare results to other approaches and published works and cite accurately.
- Relate discussion to objectives and questions from the Introduction, but avoid restating them.
- Limit conclusions to data support.
- Speculate on reasons for outcomes based on other findings. Suggest future directions, methods.

# Avoiding Plagiarism

- Integrating sources into writing is challenging, but crucial for academic success.
- Balancing others' ideas with your own interpretations is key in academic writing.
- With writing experience, summarizing and restating the ideas of others becomes easier.
- Follow guidelines to avoid plagiarism.

# Avoiding Plagiarism

- Not citing information from another source.
- Paraphrasing that is too close to the original (patchwriting).
- Copying online sources into your paper.
- Failing to quote the source.

## What doesn't require acknowledgement?

- Common knowledge that your readers will already know. **Examples:** Sun rises from the east.
- Common knowledge in a specific field. **Examples:** Newton's laws of motion.

## What you should acknowledge?

- Direct quotations: using someone else's words in your paper. **(Rare practice in scientific literature)**
- Paraphrasing of facts and statistics that most people wouldn't know.
- Paraphrased or summarized claims, and theories.
- Ideas from personal communication with others.

# Avoiding Plagiarism - Do's

- Scan introduction, headings & conclusion before reading to get an overview.
- Take notes or highlight key points relevant to your research.
- Summarize in **your own words** after reading and note-taking.
- Include direct quotations sparingly and only when appropriate.
- Note clearly when you are adding personal comments to the findings.
- Keep track of all bibliographic information.

# Avoiding Plagiarism - Dont's

- **Patchwriting**, which is the act of copying a passage and only changing a few words, as it still counts as plagiarism.
- **Copy-pasting** text without proper summarization, paraphrasing, or quotation is considered plagiarism.
- **Forgetting to cite** is plagiarism!
- **Don't use large language models to write for you!**

# Avoiding Plagiarism - Summarizing

- Summarizing is condensing information in your own words.
  - Includes main argument and supporting ideas.
  - Avoid restating the main ideas repetitively.
- Avoid adding personal opinions while summarizing unless properly indicated as your own and not the original author's.
- The summary length depends on your writing purpose and the original work's length.
- Acknowledge the author's last name with a parenthetical citation or in the text itself.

# Avoiding Plagiarism - Paraphrasing

- Restate the passage in your own words.
- Typically has a similar length as the original, unlike a summary.
- Usually, only sentences or paragraphs are paraphrased.

## Examples:

**Original sentence:** "The government is implementing new policies to improve healthcare for citizens."

## Paraphrasing vs Patchwriting:

1. New healthcare measures are being introduced by the government to benefit the public.
2. The administration is implementing fresh policies to enhance healthcare for citizens.
3. The authorities are adopting novel strategies to upgrade healthcare services for the people.

# Writing

- LaTeX or Microsoft Word are commonly used tools for writing.
- Collaborative work is supported by Google Docs or Overleaf (see TU Dresden ShareLatex)
- Use a template to help with formatting:
- IEEE TVCG journal paper template: <https://tc.computer.org/vgvc/publications/journal/>



# Useful tip – Summarizing and Paraphrasing

- Understand the material completely before paraphrasing or summarizing.
- It may require multiple readings to be able to restate the original source in your own words

## Important resource:

Purdue's online writing lab

[https://owl.purdue.edu/owl/avoiding\\_plagiarism/documents/plagiarism\\_one\\_pager.pdf](https://owl.purdue.edu/owl/avoiding_plagiarism/documents/plagiarism_one_pager.pdf)

# Additional Tips

- **Tailor your writing style to your intended readership:** consider the specific audience and use appropriate language and terminology.
- **Revise and edit your draft thoroughly before submission:** Your supervisor is not responsible for teaching you basic grammar and spelling. Dedicate time to refine, rewrite, and improve the manuscript.
- **Use concise language:** Avoid unnecessarily lengthening your report by using lengthy words or sentences instead of shorter, simpler ones.
- **Improve figures' quality:** Ensure that the details in the figures are clear and legible. Avoid using oversized figures to increase the report's length.

# Additional Tips

- **Outline your writing:** plan out major headings and key ideas before starting to write to ensure a well-organized text.
- **Organize your paragraphs:** start with a clear topic sentence that sets the stage for the following sentences to follow in a logical sequence.
- **Use appropriate tenses:** Avoid using "might," "may," and "would" as they weaken the clarity of the statement.
- **More about tenses:** Use past tense for methods and results, and present tense for accepted facts and discussing results and conclusions.
- **Table and figure captions should not merely name them:** they should provide enough information to explain how to read them.

# Additional tips

- Sentences should never start with an abbreviation or acronym.
- Avoid using contractions (e.g. didn't, can't, haven't) in formal writing.
- Avoid direct quotes. Paraphrasing is typically more concise and effective.
- Read and re-read your references.
- Ensure each sentence has clear context and organize them logically within paragraphs.
- Allocate sufficient time for writing, as it's a process that requires multiple revisions.

# Additional tips

- Take a break after finishing the rough draft, then revise details like the language.
- Writing quality reflects research quality. Use clear, direct language and concise words.
- Use a high quality research paper as a writing model.
- Have a team member review your draft and consider their feedback.
- Carefully check grammar and spelling. Ensure clear and logical ideas.
- **Remember:** Even experts struggle with writing. A perfect paper won't be achieved on the first attempt.

**D Day: Send the draft to your supervisor for his/her feedback!**

# Useful resources

- [https://cloudstore.zih.tu-dresden.de/index.php/s/mS8zW79tmrg79Rz?path=%2FScientific\\_Writing](https://cloudstore.zih.tu-dresden.de/index.php/s/mS8zW79tmrg79Rz?path=%2FScientific_Writing) (Hauptseminar SS 2022)
- [Tips for Writing Technical Papers \(stanford.edu\)](https://www.stanford.edu/group/technicalwriting/)
- <https://web.stanford.edu/class/ee384m/Handouts/HowtoReadPaper.pdf>
- <https://www.science.org/content/article/how-seriously-read-scientific-paper>
- <https://www.scribbr.com/citing-sources/citation-styles/>
- [https://www.sprachenzentrum.tum.de/fileadmin/w00buo/www/Sprachen/Englisch/Academic\\_English\\_Cluster/Department\\_Resources/WZW\\_SW\\_Guidelines\\_Scientific\\_Paper\\_WS1617\\_151006.pdf](https://www.sprachenzentrum.tum.de/fileadmin/w00buo/www/Sprachen/Englisch/Academic_English_Cluster/Department_Resources/WZW_SW_Guidelines_Scientific_Paper_WS1617_151006.pdf)
- <https://www.scribbr.com/plagiarism/how-to-avoid-plagiarism/>
- <https://library.ndnu.edu/internationalstudents/avoidingplagiarism>
- <https://www.citationmachine.net/resources/plagiarism/how-to-avoid-plagiarism/>

**Thank you. Please feel free to ask any questions. 😊**