

# Technical Report Writing

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# Overview

- Communication just as important to engineers as programming and theory - can't exist in a bubble.
- Clearly communicate (sometimes very complex) technical ideas.
- Do so in a professional documentation style
- This is a weak point for students - be good at this

# Good | Bad

- Quickly appreciate motivation and key points.
  - Give the whole plot away in the summary.
- Plain, clear, simple, concise English.
  - ~1 sentence -> 1 statement of fact.
- Crisp diagrams help explain complicated sections.
- Reader is directed to see important features in images/charts.
- Professional references and citations.
- Clearly fits in with other literature.
- Enjoyable to read.
- Rambling. Unclear what the point is until reading whole document. Too many words.
- Colloquial language or too much flowery intellectual-speak (moreover, hence, ergo...).
- Too many personal opinions, not supported with sound justifications.
- Doesn't pitch to the right audience (assumed experience).
- Complex walls of text - no diagrams.
- Clip art or unclear/unhelpful images.
- No references - writer has not reviewed existing work.
- Boring (wasting the reader's time).

# Types of Technical Document

- **Technical Report** / white paper
  - 4~10pg summary of new technical work or review.
  - Not peer-reviewed.
  - Published on college/company website or in-house booklet.
  - Can be formally referenced/cited. Has publisher, numbers, series etc.
- **Conference paper**
  - 6-8pg contribution to specific conference topic.
  - Peer-reviewed (usually 3 anonymous volunteers)
  - Published in conference proceedings or lecture notes series. Presented at conference.
  - Most common academic output. Lots of prestige for companies.

# Types of Technical Document

- **Journal article**
  - 6-10pg contribution to specific journal topic.
  - Peer-reviewed (usually 3 anonymous volunteers)
  - Published in journal volume. May be presented.
  - Journal prestige usually much higher than conferences.
- **Thesis**
- **Book** or book chapter

# Structure

- All types have similar structure. Usually publisher provides a template.
  - Title, authors, affiliation, date
  - Summary or **abstract** paragraph
  - **Intro**/Background/Related Works
  - **Method** (may be several sections)
  - Results/**Discussion**/Future Works
  - **References**/Bibliography
- Your short reviews may merge intro+method+discussion in one section and have these as paragraphs instead.

# What to Put In Where

- Summary or abstract paragraph
- Intro/Background/Related Works
- Method (may be several sections)
- Results/Discussion/Future Works
- References/Bibliography

*"I'm very busy and important - give me a 1 paragraph summary of the entire thing. I'll read details if it interests me." **Spoilers.***

**What's** the motivation behind this technique? Talk about some similar techniques that you may know - what are the pros and cons?  
**Add formal reference(s).**

**How** does this thing work? Put **algorithms**, code **listings**, or **diagrams** here to help.

Discuss the merits and drawbacks. Where would it be useful and why? You may add personal opinions and suggestions here.

The full reference for tech docs referenced should appear here.  
*Authors, title, how published, year, publisher, etc.*



# Publications



## We publish our work.

Valve engineers and artists regularly contribute to industry publications and academic conferences. Their articles, papers, and presentations cover a wide range of topics, from the high level goals of Valve's cabal development process to the inner workings of our cutting-edge rendering algorithms.

## 2015

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- Sergiy Migdalskiy. March 2015. "**Physics for Game Developers: Physics Optimization Strategies.**" Game Developers Conference.  
[Slides](#), [Video](#)
- Dirk Gregorius. March 2015. "**Robust Contact Creation for Physics Simulations.**" Game Developers Conference.  
[Slides](#)
- Alex Vlachos. March 2015. "**Advanced VR Rendering.**" Game Developers Conference.  
[Slides](#)
- Pierre-Loup Griffais, et al. March 2015. "**Vulkan: The Future of High-Performance Graphics.**" Game Developers Conference.



# Examples

- Emulate style of good papers and know what a bad paper reads like.
- Handout:  
[http://www.valvesoftware.com/publications/2007/SIGGRAPH2007\\_AlphaTestedMagnification.pdf](http://www.valvesoftware.com/publications/2007/SIGGRAPH2007_AlphaTestedMagnification.pdf)
- The Tech Reports list from when I was studying  
<http://complexity.massey.ac.nz/cstn/index.html>
- Search on Google Scholar etc from within college network to get full texts.
- Plenty of trees articles with diagrams and formal algorithms e.g. BSP trees.

# LaTeX

- Very professional-looking typesetting.
  - Beautiful rendering of mathematical formulae.
  - Excellent referencing support.
  - More reliable for large documents (final year reports / thesis).
  - EPS etc vector images.
  - Output PDF.
- Similar to HTML or markdown style (just as fiddly).
- Programs exist to write in md and convert to latex.
- **Overleaf** and **ShareLaTeX** online editors are very good. Plenty of desktop apps.

# Your Assignments

- Like this but only ~2 pages.
- A well placed diagram would be good.
- Don't forget to properly reference the thing you are reviewing.
- If you want to learn LaTeX - start with an example document and modify it.