Writing a document

Based on: How to Write a Paper by Mike Ashby

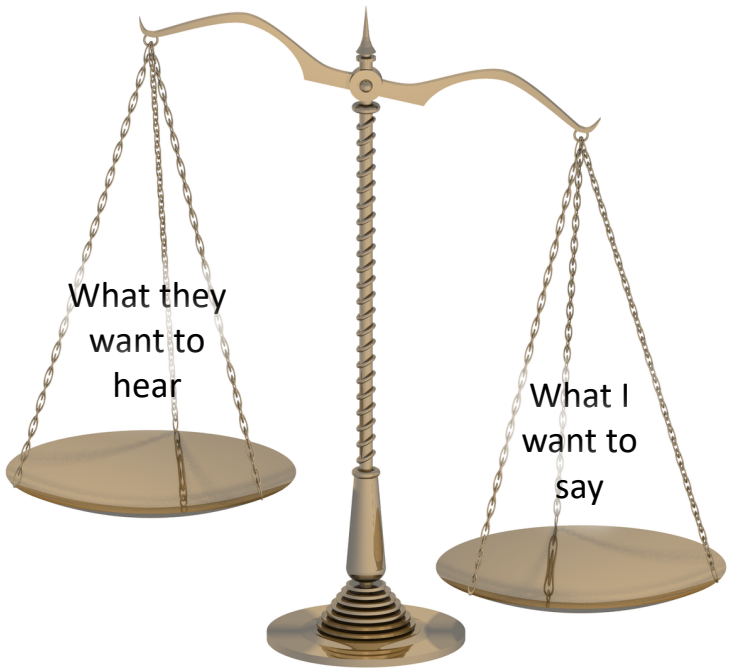
Engineering Department, University of Cambridge, Cambridge
6rd Edition, April 2005
http://www-mech.eng.cam.ac.uk/mmd/ashby-paper-V6.pdf

The ~~nine circles~~ five steps of writing

- How to write a document?

Know your audience

- Are you writing a thesis?
  - Your audience will be (mostly) the experts.
    (only the jury will read it! :D, jk?)
  - A lot of details are expected.
- Is it a scientific paper?
  - Will be reviewed by experts in your field.
  - Very knowledgeable. Need strong arguments!
  - Skeptical!
- Is it a Project proposal?
  - Audience (stakeholders, clients) may not be expert in CS.
  - They will have different priorities ($, relevance).
  - Does it look like you know what you are doing?



How to start?

- Know what you want to say!
  - You don’t know what to write! Do you know what you want to say?

- What’s the point?
  - Research paper: look at how I solved this hard/cool problem.
  - Project proposal: This is my plan to solve this problem.
  - Essay: This is what I think about this issue. Here is proof.
  - Thesis: This is my thesis. Let me convince you.

- What do I need to do this?
  - Figures, diagrams, references?

Ignore the formatting

- Put down some bullets, e.g.:

Introduction:
- It's difficult to write a document, so can I improve student's experience?
- Explain how to start writing a document:
  - Start by putting down some bullets
    - Make a snarky comment that it's the same with presentations!
    - Make a joke about how this is the opposite of advice in the presentation about presentations!
  - Think about what you want to say
  - Don't try to write the perfect document first try – iterate versions.

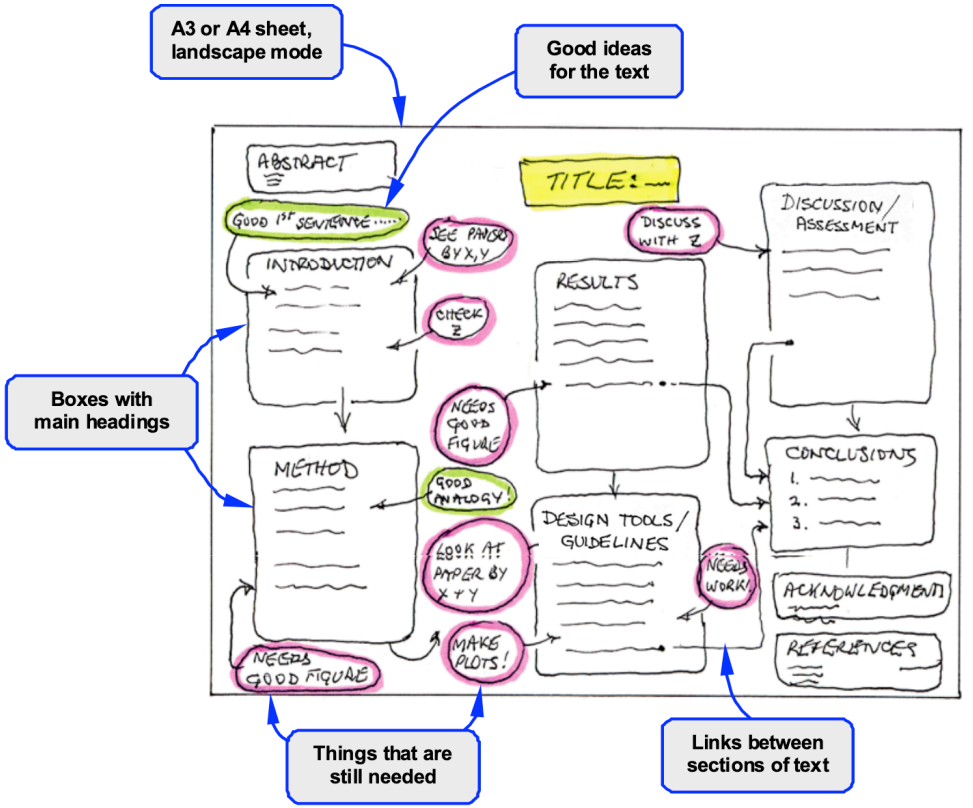
Format:
- You need to format your document
- Introduction, conclusion, abstract, the title
  - Explain the function of each of them.

…

Concept-sheets

- More visual
  - Set up post-its, make a drawing, use a board

- Check the document I based this presentation on
  - Figure 3, page 6
  - The model for a concept sheet



Develop your bullets into a first draft

- Start converting those bullets into text

- Don’t worry too much about readability at first
  - You may get stuck rewriting a paragraph for hours
  - And end up removing it in the end ☹

- Improve the draft in multiple iterations
  - Get feedback: group members, mentors, friends, etc.

Forget about it

- If you stare at something for too long, you'll miss the details

- Ignore your document for a period (1-2 days)
  - Give it to a collaborator?
  - Do it early so that you have the time

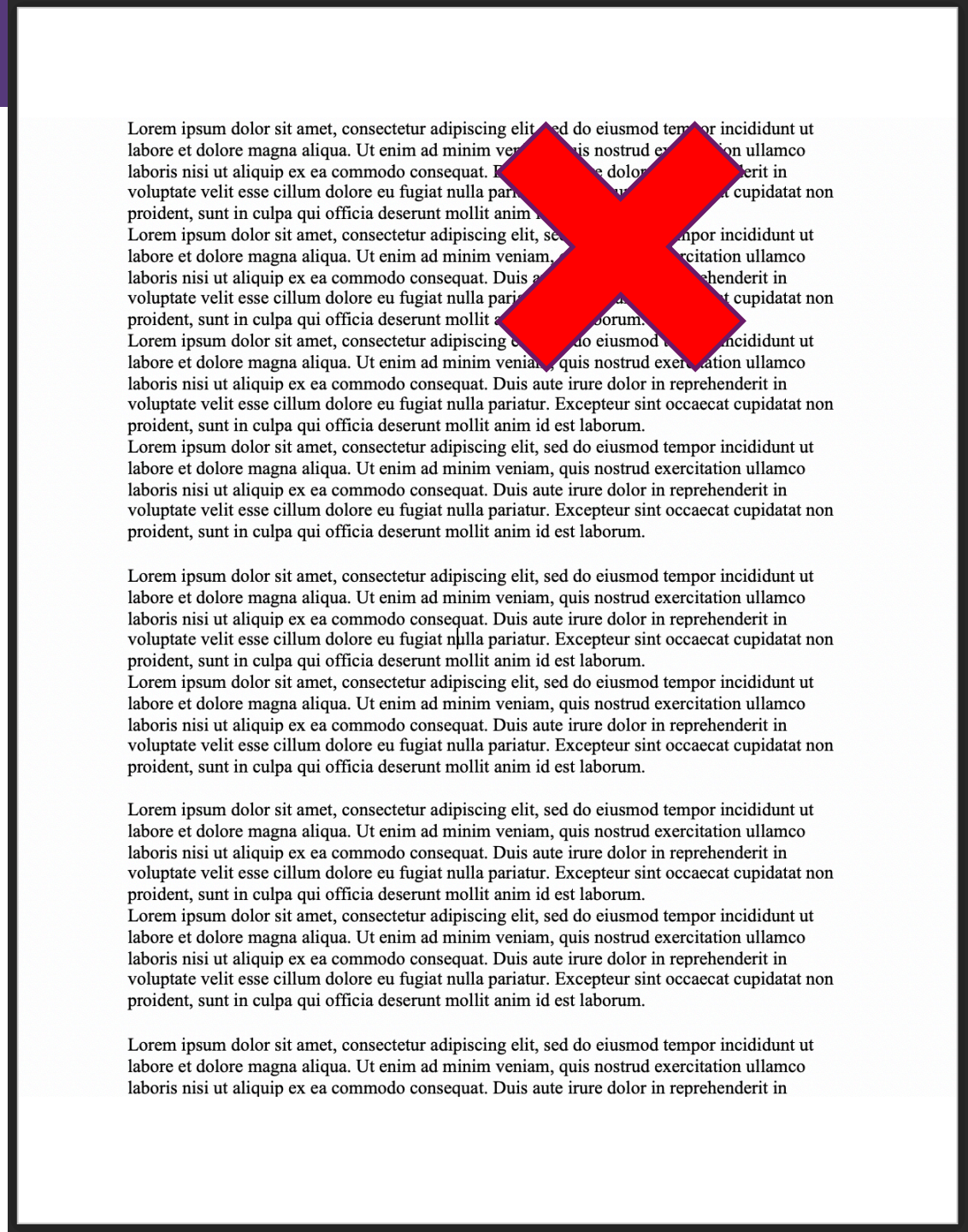
- Then read it!
  - So many wrong things with it!!!!
  - How did I miss this?
  - Read out loud!

https://www.forbes.com/sites/katelee/2012/08/01/to-write-like-a-human-read-your-work-out-loud/#48af62474771

Organization

Format

Have one!



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The high level

- The title page
  - This is your lure!

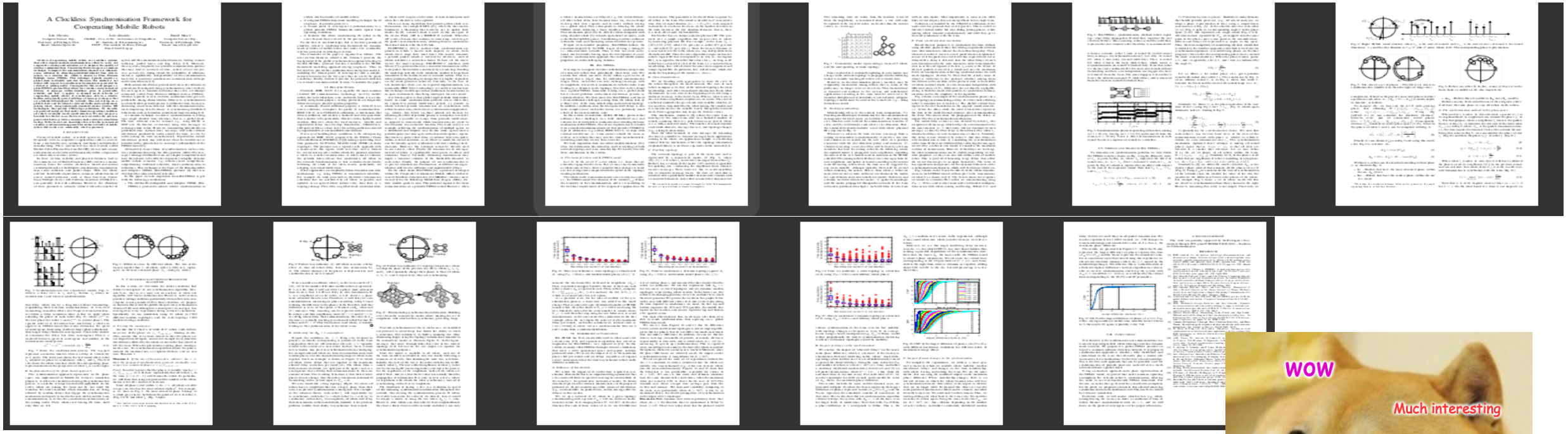
- Abstract (if longer than 1-2 pages) [Executive summary in projects!]
  - The reader bit, reel the reader in!!!

- Introduction
  - Convince the reader of the value of your work

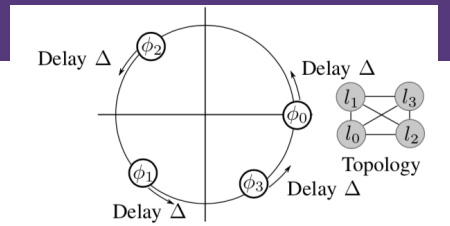
- Body
  - The detail, for those who really want them!

- Conclusion
  - The thing everyone will remember

How I see my paper



How they see my paper



A Clockless Synchronisation Framework for Cooperating Mobile Robots

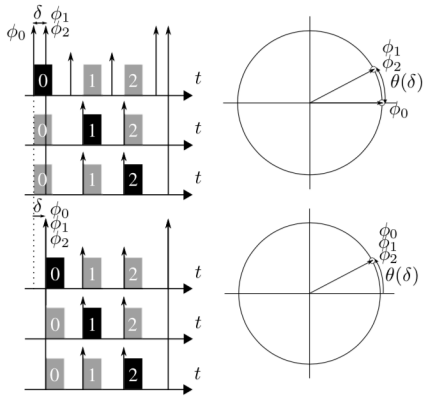
***Abstract*—Cooperating mobile robots are real-time systems** global TDMA protocol that allows for real-time and guaranteed delivery of messages within deadlines, given its predictable

Nice title

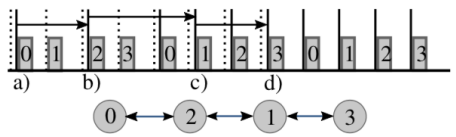
Abstract… Hmm good

VII. Conclusions

Conclusions… nice!



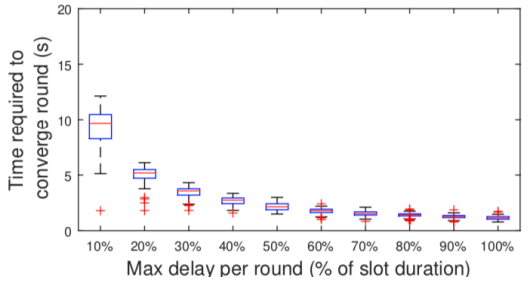
Cool pictures, they are great



Did you cite me???

References

[1] IEEE standard for information technology–telecommunications and information exchange between systems local and metropolitan area networks–specific requirements part 11: Wireless LAN medium access



The title

- This is how you lure the reader
  - It’s the first thing anyone will read
- Title should match the contents
  - Document ignored
- But it should sound interesting and appealing

Rate Monotonic vs. EDF: Judgment Day

GIORGIO C. BUTTAZZO
University of Pavia, Italy

The abstract

- Three words: Short, meaningful, insightful

- The reader bit the lure!
  - Reel it in!

- Don’t make it too long!
  - Go to the point
  - Set expectations for content
  - Leave details for the document

Introduction

- Explain what you will be talking about
  - Is this a project proposal, report, essay, opinion article?

- Set the context to the reader
  - **Where** does this work fit in the grand scheme?
  - **Why** is the problem important/interesting?
  - **How** do you propose to solve it?
  - Answer the question: “So what?”

Introduction

Capture the reader's attention, start strong!

It is widely accepted that my subject is of great importance… zzzzzzzzzzz 😴 … but in fact there are issues that... zzzzzzzzzzz 😴

"Scientific reproducibility is a problem that likely will require a few hops of progress before we land on a complete solution."
- wilkie

The body

- This will greatly depend on what you are writing
  - No formula ☹

- What do you want to tell the reader?
  - You did something and have some results (paper)
  - You are planning something (project proposal)
  - You have a thesis (well… a thesis)

Writing a project proposal?

- Objectives
  - This project will… to... Because
- Approach
  - We'll solve it by creating an app that does this… to solve that…
  - I need to learn how to do …
  - I'll use the programming language/framework because…
- How? By when?
  - I plan to have this stage complete by… and that stage by…
  - This stage may take longer than predicted because…
- Product
  - The expected outcome is… that is capable of… fulfilling all the objectives

Writing a report?

- Objectives
  - This project objectives were…
- Approach
  - I solved the problem by… using this technique…
  - Communication with client was done like so…
- Completion
  - Fulfilled initially set objectives 1 through 5.
  - Did not complete objectives 6 through 7 due to a change of requirements
  - Didn’t have enough time to complete objective 8.
- Issues and reflections
  - Using tool X was a good decision because…
  - Using tool Y was a bad decision because…
  - Communicated with client/developers this way… It did(n’t) work because…

It’s your work but you’re not alone

- Refer back to what you want to say!

- Check if there is a guide
  - In my website is the guide is very flexible
  - others may not be

- Check what other people did
  - Ask colleagues, friends, mentors

Other references

How to Structure & Organize Your Paper
by Odegaard Writing & Research Center

https://depts.washington.edu/owrc/Handouts/How%20to%20Structure%20and%20Organize%20Your%20Paper.pdf

Guidelines for Project Proposals
by Someone?

http://writing.engr.psu.edu/workbooks/proposal_guidelines.pdf

Conclusion

- Not only a summary!
  - The summary is important, but not everything!

- Re-frame your topic in context
  - What was your contribution?
  - How are things better now?

- End with a strong statement
  - Give the reader something to think about.
  - And remember you!

Other odds and ends

Grammar, spelling, punctuation

- Boring!!!
  - But check How to Write a Paper by Mike Ashby
  - It has come interesting advice
  - And suggestions about not boring readings!

Figures and tables

- Always label and caption your figures and tables

- Introduce them in text

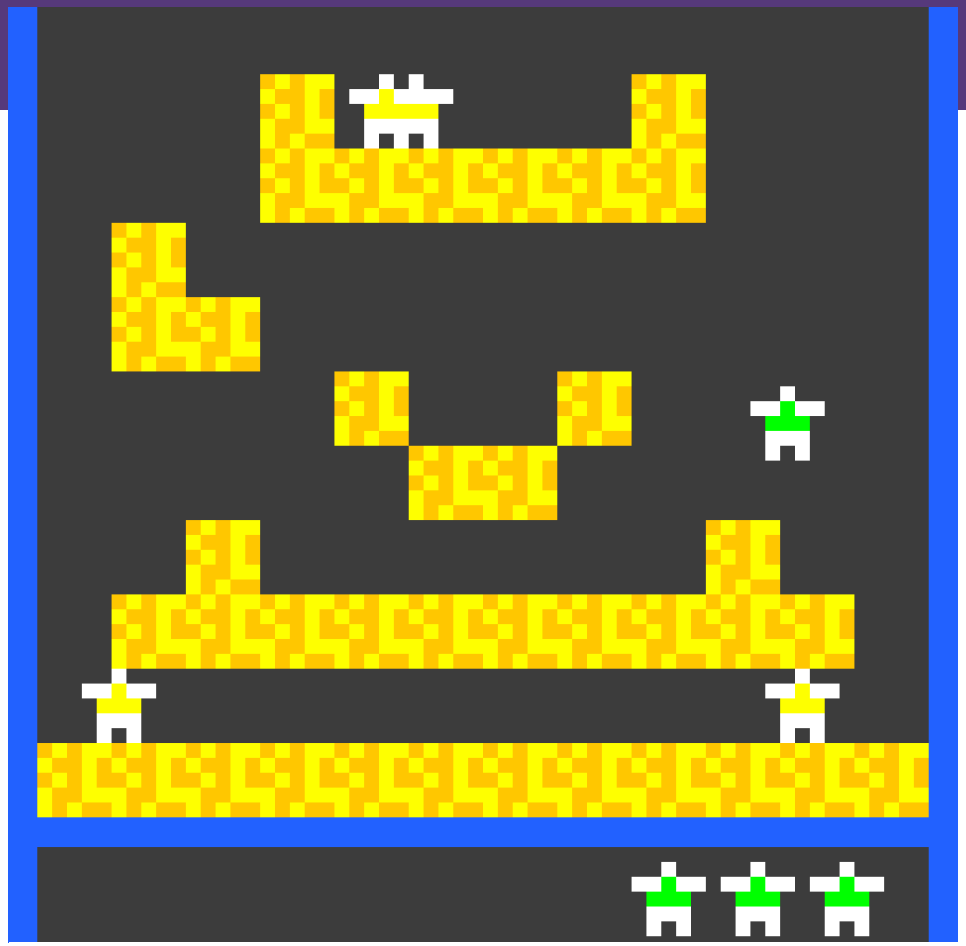


Figure 1. Frame of the second CS 447 project.

… as depicted in **Figure 1**. The project consists of a video game looooosely based on Bubble Bobble. It will be programmed in MIPS assembly.

Define everything!

- “TDMA is a well known technique…”
  - Sure, except I have no idea what you are talking about!

- Define all acronyms, abbreviations, units, symbols, etc.
  - Just because you know it, someone may not
  - E.g. “Time Division with Multiple Access (TDMA) is a well known technique…”
    - Then you can use TDMA :D

- And **please** use common terminology