Presentation Notes

I'll list all the notes I have for the presentation here.

Software to use

I have various options available to me for the presentation. I'll list them here and evaluate their pros and cons.

This might seem like a waste of time at first, where I could jump istinctively to the first option that comes to mind, since I have the skills to use any of them creatively.

However, I have a week left approximately, so I need to make sure I'm not wasting time on the wrong option. This will also serve to reorder my thoughts and restart with a fresh mind, after a long deterioration of my mental state.

- **PowerPoint** or equivalents - I can't wrap my head around its entire paradigm and it's mediocre at best. Hard pass for sure.
- **Latex Beamer** - First time I use Beamer, although at this point I'm pretty familiar with Latex. I can use it to create a presentation that looks good and is easy to edit.

  In order to make it look good I'd have to find a pretty good template, as there's no time to create one from scratch, although I do have a great skillset to do so myself.

  Time is limited however and I can't use my talent with that, I need to save energy for my mental state.

  Assuming I find a good template, I can use it to create a good looking presentation and the great advantage is I can easily edit it with my Latex skills, with a very non-destructing workflow.
- **Canva** - This is a very easy to use software but it has disadvantages. It's not free, it's not open source and it's not very customizable.

  I can use it to create a presentation that looks good and is easy to edit.

  This will probably give the most aesthetically pleasing result, but its lack of flexibility can hinder me in the long run. There's intrinsic limitations to the setup in the presentation room, so I can't use it to its full potential and can't probably take advantage of the animations, assuming I have no way to use the presentation offline in its native format.

  What I need to check is whether I have these exporting options:

  - **PDF** - I can use it to create a static presentation that is portable and readable anywhere. Being static, this would be a waste for Canva itself. I would still make a static PDF as a backup though, regardless.
  - **SVG** - I can make the presentation in the most flexible format possible and then further edit it in other software, like Inkscape. Time is limited though and I'm not sure it's worth the effort.
  - **HTML** - I can use it to create a presentation that is portable and readable anywhere. Any modern browser can read it, so I can use it to present the presentation, even offline and take

advantage of the animations. This would be the best option, assuming Canva can exporet to HTML. I would still make a backup PDF, regardless.

- **Inkscape** - This is my go to vector editing software, however I would need to plan everything from scratch and it's not particularly flexible with PDFs, although now it supports multipage documents. This would be very powerful in conjunction with *Sozi*, in order to get an offline HTML presentation. Way too time consuming, unfortunately.
- **Sozi** - This could be the ultimate weapon at my disposal, assuming I have an SVG template to start from (might be from Inkscape or Canva), I would just export an offline readable HTML file that I could open in any browser. Used in conjunction with Inkscape's power and flexibility, I could make a free canvas presentation, which is way more pleasing and fresh compared to the usual page by page layout. Again, this would probably take way too long, despite being the best option.

Presentation structure

At the moment, my best choice is either going to be Latex Beamer or Canva. Either choice should give my a standard page by page presentation, which is the most common and easy to follow. Assuming I go for either of these, the overall document structure should be mostly the same.

As far as the page layout goes, I could choose a 4:3 aspect ratio, which is Beamer's default and the one I tend to like the most, due to the extra vertical space.

However, as the presentation is very likely to be projected on a 16:9 screen, I should probably use that aspect ratio, in order to fully utilize the screen real estate.

As far as the content goes, I need to make sure I have a good structure, in order to make the presentation flow smoothly and that I stay within the imposed time limit of 15 minutes.

My best choice is to utilize a very simple and visually effective structure, which gives me the most flexibility when speaking and allows me to improvise or cut down on the content, if time is running out.

I'll try to organize it point by point.

Introduction

- **Title** - I should probably use the title of the presentation, which is *Preparation of bio-based powder for 3D printing applications by Selective Laser Sintering*.
- **Thesis goal** - I should quickly state the goal of my thesis, probably in a single sentence that is straight to the point. A bit harder to summarize, but a simple slogan should be enough, allowing me to elaborate on it for a couple of minutes, if necessary.
- **Thesis work structure** - I should emphasize in the most brief and effective way possible how MY work has been structured throughout the months of torture, i.e.
    - **Research** - I should quickly state the research I've done, in order to get a better understanding of the topic and the tools I had at my disposal
    - **Experimental phase** - I should touch on the various phases, which I'll discuss in more detail later on, i.e. :

- **PHBH choice**
- **Powder production**
- **Powder characterization**
- **3D printing**
- **Results**

All of this should be very brief, as I don't want to bore the audience with the details.

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ⓘ  Estimated time: 1-3 minutes
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Powder production

I should quickly explain the two possible approaches for powder production, i.e. :

- **Cryogenic grinding** - I should briefly touch the process and the advantages and disadvantages of this method.
- **Chemical precipitation** - I should briefly touch the process and why it has been chosen for this project.

I should then explain in more detail our recipe for the chemical precipitation, using a diagram to facilitate the understanding of the process.

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ⓘ Estimated time: 1-3 minutes
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Powder characterization

I should quickly explain the various methods used for powder characterization, i.e. :

- **SEM Analysis** - Brief explanation with *DALL-E*'s example and two significant images matching the ideal
- **Particle Size Distribution** - A statistical analysis putting into perspective the results of the SEM analysis, with a histogram plot for the distribution and their circularity
- **DSC Analysis** - Brief explanation of the analysis, with a focus on the plot and its points of interest, being broken down into multiple curves for a more fluid and visually clear explanation
    - *Cold Crystallization*
    - *Melting points*
    - *Glass transition temperature* (probably not)
    - *Sintering window* - The most important one, as it's the one that will be used for the 3D printing process

    I'm not sure if I should include the areas under the peaks for the enthalpy of fusion and the enthalpy of crystallization, as they are not very important for the 3D printing process, they require a long explanation and are only useful to calculate the percentage of crystallinity of the material.

It seems like a waste of time, I might just report the result without any redundant plots.

- **TGA Analysis** - Brief explanation of the analysis, then a plot of a single TGA curve with its derivative, transitioning to a plot with a powder sample overlapping the pellet sample, with no derivative. Keep it stupid simple.

This is a lot to digest, so I should probably keep it short and sweet. Oversimplifying is better than overexplaining.

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ⓘ Estimated time: 3-5 minutes
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3D printing

This is the key part of the work. I will quickly explain how I prepared the powder and the machine used (Sharebot Snowhite², not sure I should include a picture, it seems extra), then I will show the results of the 3D printing process, in the same order I used for the thesis.

This should be simpler than the previous part, as I'll just show the images with important parameters in the caption (there's no way I could remember) and explain them one by one: why they are important, what they mean and how they relate to the previous results.

I'll briefly touch on the thermal stability and the mechanical properties, by showing the overlapping results of the three sample TGA (pellet, powder and 3D printed sample) and then briefly showcase the DMA with a brief comment (there's not much to say).

In short, here are the points I'll cover:

- **Setup** - super briefly, just to show the machine and the powder
- **Results** - I'll show the results of the 3D printing process, in the same order I used for the thesis, this is the most important part for sure
- **TGA overlap** - just to showcase the thermal stability
- **DMA** - just to showcase that the mechanical properties are poor, but in line with all bio-based polymers

Unfortunately the pictures of the 3D printed samples are not very good, so I'll have to make do with what I have (not my fault!)

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ⓘ Estimated time: 3-5 minutes
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Conclusion

Here I'll just summarize the results and the conclusions I've drawn from the work, with a reference to the paper I've written in collaboration with other researchers.

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ⓘ Estimated time: 1-2 minutes
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References

Just some support slides if necessary and a shorter version of the bibliography, with the most important references.

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ⓘ Estimated time: None
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All these time estimates are very rough, the goal should be to hit the lowest possible time, while considering the rest as buffer.

Technical aspects: directory structure, file format handling and general workflow

I verified what my possibilities are with Canva and unfortunately there's no clear way to create an offline HMTL presentation, which is a shame.

I still have the option to export a PDF, but that defeats the purpose of using a web-based tool.

This is an issue with how my university wants everyone to present their work, as they don't let us use our own laptops, so I have to use the available computer and bring my own USB stick. That sucks. I would log in to the service I need, but I don't feel comfortable doing that on a machine I don't own and they probably won't let me do that anyway, as logging could take a while, which seems to be lacking in the first place.

I'll use LaTeX Beamer and export a PDF, which is fine with me and a more powerful and versatile option nonetheless, although less aestethically pleasing.

Directory structure

I'll use the following directory structure:

- 🗀 **~/Bibliography/** - Containing my custom *.bib* file I use in every work
- 🗁 **~/Master_degree_Thesis/PRESENTATION/** - The main directory, containing these very notes and the other subdirectories
    - 🗁 **Pictures**
        - 🗁 Raster
        - 🗁 Vector
            - 🗀 PDF
            - 🗀 SVG
    - 🗀 **Latex** - Containing the *.tex* file and the auxiliary files, as well as the compiled *.pdf*

File format handling

I will utilize vector images for plots and charts, as usual.

I'll create an SVG template for each plot or graph using *Inkscape*, matching the color palette and Beamer theme I'll use (which I'll probably customize).

That should be relatively easy once I have decided on the template, considering that I'll just redraw plots I already created in the thesis, just with different colors and AR to match my 16:9 document.

I'll make sure to stay consistent with fonts and the palette, so that the presentation looks uniform and professional.

Once I have the SVG files all ready and catalogued, I'll export them ad PDF, since this bears better results than an EPS, which might occasionally get rasterized entirely if there are meshes and other elements that are not vectorized (not sure this is an Inkscape bug, but PDF will do the trick regardless).

As far as diagrams, I might just create them with Latex's *TikZ* package, which is very powerful and versatile, but I'll have to see how much time I have left, since I never used it before.

Now that the structure is clear, I can start working on the presentation itself.