TU Clausthal
Clausthal University of Technology

Pandoc Template Development for E-Learning

Type	Master Thesis
Credits	30 CP
Start date	01.05.2023 / 01.06.2023

Description

As a research group, the ETCE-Lab offers various courses (https://etce-lab.com/index.php/courses/). Our current workflow for developing course material for these courses is as follows:

1. We create presentations (.pptx files) in an office suite, such as LibreOffice.
2. Export these presentation files to PDF.
3. Publish these files to our GitHub repository under a CC-BY-SA-4.0 License (https://github.com/ETCE-LAB/teaching-material).

While this workflow is relatively simple, it two main drawbacks:

1. Modifying and unifying style, for e.g., bullet point styles, fonts, etc. is a highly repetitive and time-heavy task.
2. Handling merge conflicts for .pptx files is virtually impossible, since they cannot be diff-ed like ordinary text files → any changes that were made by different contributors would have to be made again.

Furthermore, we are planning to transition our courses to the Massive Open Online Course (MOOC) model, and would like to develop interactive content in a format that is web-friendly, such as Shareable Content Object Reference Model (SCORM) packages; while also producing PDF course materials do distribute to students who prefer offline course material.

Pandoc (https://pandoc.org/MANUAL.html) is an extensible Haskell library for converting between various markup formats such as markdown, HTML, .docx, LaTeX, etc. It also supports the creation of custom templates (https://pandoc.org/MANUAL.html#templates) for managing special conversion rules. You task is to develop a set of requisite scripts, (such as using Pandoc Templates) to convert course material developed in Markdown, to both LaTeX Beamer Presentations; as well as SCORM packages.

Prerequisites

1. Versatile programming experience, including but not limited to:
    1. HTML
    2. CSS
    3. Javascript
    4. Haskell (Optional)
2. Experience with GitHub projects and FOSS development

Tasks

Your task will be composed of the following:

1. To develop a set of requisite Pandoc templates to facilitate the following workflow:
    1. We develop course material in Markdown.
    2. We develop a unifying set of style patterns, including but not limited to:
        1. Bullet style
        2. Fonts
        3. Background Images
        4. Table style
    2. Conversion of the Markdown course material (using Pandoc) into two formats:
        1. LaTeX Beamer PDF files
        2. SCORM packages
2. Create scripts for mass-conversion using GNU Make (https://www.gnu.org/software/make/).
3. Maintain the implementation on a GitHub repository with detailed documentation of the project (Licensed under a FOSS license such as GNU GPLv3).
4. Write a report, ie., thesis.

Contact

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