How to create presentations with emacs-reveal *

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Presentation Hints

General

- This is a reveal.js presentation and an Open Educational Resource (OER)
  - Generated with emacs-reveal from Free/libre Org mode sources
    - See usage hints for emacs-reveal presentations
  - Key bindings and navigation
    - Navigation with standard controls in lower right
    - Press "?" to see key bindings of reveal.js, e.g.:
      - Keys "n" and "p" move to next and previous slide (mouse wheel works as well)
      - Search with Ctrl-Shift-F
      - Up/down (swiping, arrows) move within sections, left/right jump between sections (type "o" to see what is where)
      - Type "g", slide number, Enter, to jump to that slide
    - Custom controls in lower left with selected features
    - Browser history works
    - Zoom with Ctrl-Mouse or Alt-Mouse

Why?

- I created emacs-reveal as software bundle to produce Open Educational Resources (OER) for my own teaching
  - Described in (Lechtenbörger 2019a)
  - Personally, I prefer text over video when learning
    - Skim reading with superior search, navigation, and hyperlinks; own speed
    - Lots of students like audio explanations (and PDF), though
- Education should be free and open

*This PDF document is an inferior version of an OER in HTML format; free/libre Org mode source repository.

  - Recording of a talk "Open Educational Resources: What, why, and how?"
  - Proper license attribution is a hassle
    * Emacs-reveal simplifies that process (for me), see (Lechtenbörger 2019b)

Offline work

- Students often ask for download-able presentations
- Alternatives
  1. Clone repository, build presentations locally (see Usage)
  2. Download build artifacts from recent pipeline (if not expired)
  3. Generate PDF
     - Why, really?
       * Why not download source files instead?
       * Org mode, which is plain text
     - Change the URL by adding "?print-pdf" after ".html", then print to PDF file (usually, Ctrl-p)
       * Or print to PDF in Docker
         · E.g., printed howto
     - Alternatively, generate PDF via LaTeX from Org source file
       * Replace `.html` (and whatever follows) in address bar of browser with `.pdf`
         · E.g., this howto as PDF

Audio

- Audio should start automatically here (differently from emacs-reveal's default)
  - Enthusiast by Tours
    * Licensed under Creative Commons Attribution 3.0 Unported (CC BY 3.0)
    * Converted to free Ogg format with Audacity
  - See compatibility and known issues of the underlying audio plugin
    * Firefox, which I recommend as browser in general (here in English and here in German), seems to work everywhere
  - Audio controls are shown at bottom left

(Speaker) Notes

- Slides contain additional notes as plain text if you see the folder icon at the top right (as on this slide)

Figure 1: Figure under CC0 1.0

  - Either use custom controls (icons in lower left) to toggle notes or (deprecated) press "v" to see the "courseware view" or click on that icon or press "s" to see the "speaker notes view"
  - You need to allow pop-ups
    * If the pop-up window does not work, you may need to press "s" twice or close the pop-up window once

These are sample notes

- Lists can be used here
- You can time your presentation
  - Maybe look at one of my talks to see how to define timing

Text-To-Speech (TTS)

- Audio can be generated from speaker notes and used in a "video-mode"
- Demo presentation

Introduction

What's This?

- `Emacs-reveal` is free software to generate reveal.js presentations (slides with audio) from simple text files in Org mode

Figure 2: "Figure" under CC0 1.0; converted from Pixabay

  - Benefits
    * For your audience
      · Self-contained presentations embedding audio
      · Usable on lots of (including mobile and offline) devices with just a browser
    * For you as producer
      · Separation of layout and contents (similarly to, e.g., LaTeX)
      · Simple text format allows diff and merge for ease of collaboration

Prerequisites

- I suppose (and strongly recommend) that you use GNU/Linux (help on getting started)
  - Actually, not much here is operating system specific
- `Emacs-reveal` should really be used with the text editor GNU Emacs
  - (You could try other editors and build presentations within GitLab, thanks to GitLab's infrastructure)
    * (In fact, you do not need an editor at all but could edit presentations using a Web browser on `GitLab.com`, e.g., with the Web IDE (requires login))

Installation and Quickstart

- `Emacs-reveal` builds upon Gnu Emacs with Org mode

  - `Emacs-reveal` is available as free software on GitLab

- You also need Git
  - Getting started
    * The Pro Git book is a great source in general
  - Git introduction as OER (created with `emacs-reveal`)

- And maybe more, see next slide

LaTeX and other dependencies

- By default, emacs-reveal generates HTML presentations and PDF variants
  - PDF output requires a LaTeX installation
    * If missing, `elisp/publish.el` stops with an error, resulting in **broken** presentations
  - Add following to beginning of `elisp/publish.el` to generate only HTML

    ```
    (setq oer-reveal-publish-org-publishing-functions
          '(oer-reveal-publish-to-reveal))
    ```

- This howto also contains a DOT/Graphviz example
  - Dependencies of emacs-reveal specified in two Docker files
    * docker/debian-emacs-tex/Dockerfile
    * docker/emacs-reveal/Dockerfile

Initial Consideration

- `Emacs-reveal` can manage bundled software
  - (Submodules for Lisp packages Org mode, org-re-reveal, org-re-reveal-citeproc, org-re-reveal-ref, oer-reveal as well as reveal.js with several plugins)
  - Default with customizable variable `emacs-reveal-managed-install-p` being `t`
  - Variable `oer-reveal-revealjs-version` specifies the target version of reveal.js for emacs-reveal

- Or, you manage those components yourself
  - Set `emacs-reveal-managed-install-p` to `nil`

- In any case, `emacs-reveal` changes values of other packages (`org-ref`, `oer-reveal`) without warning

Managed install of `emacs-reveal`

- Install `emacs-reveal` in a directory of your choice
  1. Choose directory, e.g., `~/.emacs.d/elpa`, and clone software
     - `cd ~/.emacs.d/elpa`
     - `git clone --recursive https://gitlab.com/oer/emacs-reveal.git`
       * (Option `--recursive` downloads submodules)
  2. Add following lines to `~/.emacs`
     - `(add-to-list 'load-path "~/.emacs.d/elpa/emacs-reveal")`
     - `(require 'emacs-reveal)`
  3. Restart Emacs (installation of `org-ref` or `citeproc` is offered, if necessary)

Alternative installation

- You may prefer to manage submodules of `emacs-reveal` yourself
  1. Choose directory and clone (without option `--recursive`)
     - `cd ~/.emacs.d/elpa`
     - `git clone https://gitlab.com/oer/emacs-reveal.git`
  2. Add following lines to `~/.emacs`
     - `(add-to-list 'load-path "~/.emacs.d/elpa/emacs-reveal")`
     - `(setq emacs-reveal-managed-install-p nil)`
       * Read doc string of `emacs-reveal-managed-install-p`
     - `(require 'emacs-reveal)`
  3. (Now, subdirectories under `"~/.emacs.d/elpa/emacs-reveal"` remain empty)

Quickstart with `emacs-reveal`

- E.g., generate this howto
  1. Install emacs-reveal (see previous two slides for alternatives)
  2. Choose directory for howto, clone it
     - `git clone --recursive https://gitlab.com/oer/emacs-reveal-howto.git`
       * Option `--recursive` gets an embedded repository for figures
     - `cd emacs-reveal-howto/`
  3. Generate the HTML presentation from Org source `howto.org`
     - `emacs --batch --load elisp/publish.el`
     - Publication code needs to be able to locate `emacs-reveal.el`
       * Code in `elisp/publish.el` tries (a) `~/.emacs.d/elpa/emacs-reveal` (suggested on earlier slide) and (b) sibling directory `emacs-reveal`

Default Configuration

- Package oer-reveal (included in emacs-reveal) ships the file `org/config.org`
  - Meant to be included in source files of presentations for default configuration
    * Included at top of the source code of this howto
    * Please take a look

Usage

Alternatives

1. Create presentations locally on Command Line
2. Create presentations in GNU Emacs
3. Create presentations with Docker

Figure 3: "Docker logo" under Docker Brand Guidelines; from Docker

   - Docker image emacs-reveal
     - Similarly to previous alternative; necessary software bundled
     - See README of emacs-reveal
     - Introduction to Docker, built with `emacs-reveal`

4. Create and publish presentations on GitLab

Figure 4: "GitLab Logo" by GitLab under CC BY-NC-SA 4.0; from gitlab.com

   - Based on GitLab Continuous Integration infrastructure and above Docker image

Build Presentations on Command Line

0. Install emacs-reveal and howto
1. Create Org file in directory `emacs-reveal-howto`
   - See contained source file for this presentation, `howto.org`
2. Build presentations for files ending in `.org`
   - (Except internal ones, see function `oer-reveal-publish-all`)
   - `emacs --batch --load elisp/publish.el`

  - Presentations are built in subdirectory `public/`

3. Open presentation in Firefox
   - E.g.: `firefox public/howto.html`
4. Optional: Copy `public/` to public web server

Build Presentations in Emacs

1. Generate HTML presentation for visited `.org` file using Org export functionality: Press `C-c C-e w b` (export with oer-reveal)
   - This generates HTML file in current directory and opens it in default browser
   - For this to work
     (a) Settings of `emacs-reveal` should be in effect (`emacs-reveal.el` is loaded, e.g., with step (2) above)
     (b) Necessary resources, in particular `reveal.js`, must be accessible in `.org` file's directory
       - I use `emacs --batch --load elisp/publish.el` once to populate `public/`, then create a symbolic link:
         `ln -s public/reveal.js`
     (c) For image grids, you may need: `(setq oer-reveal-export-dir "./")`

Org-re-reveal and oer-reveal

- Emacs-reveal embeds the packages org-re-reveal and oer-reveal
  - Package oer-reveal is an Org mode export backend (extending org-re-reveal)
    * Starting with oer-reveal 1.4.0, part of emacs-reveal 4.1.0
    * With key binding mentioned on previous slide
  - You can export with org-re-reveal (`C-c C-e v v` and `C-c C-e v b`) or oer-reveal (`C-c C-e w w` and `C-c C-e w b`)
    * With oer-reveal, additional reveal.js plugins are enabled by default
      · See customizable variables `oer-reveal-plugins` and `oer-reveal-plugin-config`

Build Presentations in Docker

- Emacs-reveal has a Docker image
  - Docker image bundles necessary software
    * Introduction to Docker
  - Sample invocations in directory of this project

```
docker run --rm -it -v $PWD:/oer registry.gitlab.com/oer/emacs-reveal/emacs-revea
cd oer
emacs --batch --load elisp/publish.el
```

  - See README of emacs-reveal for more details

Build Presentations on GitLab

1. Fork emacs-reveal-howto on GitLab (fork documentation)
   - `git clone <the URL of YOUR GitLab project>`
2. Create or update Org files in cloned directory
   - Push changes to your fork
3. GitLab infrastructure picks up changes and publishes presentations as GitLab Pages
   - Based on Continuous Integration (CI) infrastructure
     - Configured by file .gitlab-ci.yml
   - CI run takes some minutes
   - Go to Settings → Pages to see the Pages' address

Some Presentation Features

Text Slide

- A list
- With a sub-list whose items appear
  - This is *emphasized*
  - This is **bold**
  - This `looks like code`
  - This is green
  - Nothing special

Some Fragment Styles

- Forget
- Shrink
- Grow
- Very important

Fragments with Custom Order

- I'm first.
- Fourth.
- Third.
- Second.
- I'm also first.

Centered Text

Just some horizontally centered text. Created by assigning class `org-center` (for which `oer-reveal.css` specifies `text-align: center`).

Alternatively, Org's `center` blocks are exported by plain HTML export, see `org-html-center-block`.

On Sections

- This slide is part of section Some Presentation Features
  - We can link to slides, e.g., an earlier slide
    - You can use the browser history to go back
  - Side note: Check source code to see two variants of link targets used on this slide
- This slide can also be perceived as its own subsection
  - The next slide is on a deeper level of nesting
- (This list item appears simultaneously with previous bullet point)

Another Slide

- This slide is on a deeper level of nesting
- This level of nesting is not shown in the table of contents in the slide's bottom
- By the way, the headings in the table of contents below are hyperlinks
  - And your browser remembers the history, back/forward buttons and shortcuts should work
  - Mousewheel and swiping work

Licensing

- Starting with emacs-reveal 5.0.3 (and oer-reveal 2.0.2), presentations can show license information derived from SPDX headers of the REUSE project
  - See licensing slide at the end of this presentation
    - Information on that slide is derived from header lines of `howto.org`

      ```
      #+SPDX-FileCopyrightText: 2017-2020 Jens Lechtenbörger <https://lechten.gitlab
      #+SPDX-License-Identifier: CC-BY-SA-4.0
      ```

    - Note that SPDX headers must be prefixed with `#+` to be recognized as Org mode keywords
  - License information is also embedded in machine-readable RDFa format
- Macros for OER figures with (human- and machine-readable) license information are discussed later

Reservation of rights related to text and data mining

- Starting with emacs-reveal 9.24.0 (and oer-reveal 4.12.0), presentations include meta elements of the W3C TDM Reservation Protocol (TDMRep)
  - Reserve rights related to text and data mining (TDM) in machine-readable format
  - Briefly, you must ask for permission if you want to mine my OER without respecting their license terms
    * See that document

Two Columns: Pro/Con of emacs-reveal

Pro

- Free/libre open source software
- Device-independent presentations
  - Also mobile and offline
  - Generated from simple text format
    * Easy to learn
    * Collaboration with diff/merge/git
    * Separation of layout and content

Con

- No WYSIWYG
- (Need to learn something new)

Hyperlinks

- Different types of hyperlinks exist
  - External ones
    * Plain Org mode link
      · Or with emphasis that you should really check out Org mode before you continue
    * Details of Docker are beyond the scope of this howto
  - Internal ones (within presentation)
    * Maybe pointing to an earlier slide
    * Or pointing to a later slide
    * Or emphasizing that a mentioned concept like figures and audio is revisited later

URL Parameters

- See usage hints for emacs-reveal presentations, e.g.:
  - `./howto.html?default-navigation` switches to the default navigation mode of reveal.js

  - `./howto.html?hidelinks=32` hides hyperlinks that go beyond presentation topics
    * (Note the link for navigation modes of reveal.js above)
    * Or both: `./howto.html?default-navigation&hidelinks=32`
  - Configure audio: `audio-autoplay`, `audio-speed=2.0`

Figures and Audio

- The following figures and their license metadata are maintained in a separate project
  - Embedded here as Git submodule
  - See source file for use of macros `reveallicense`, `revealimg`, `revealgrid`
    * Macros defined and documented in config.org of oer-reveal
  - Presentation contains license information in machine-readable RDFa format (Lechtenbörger 2019b)

Slide with Figure and Audio

- This figure is part of a different presentation **Warning!** Figure omitted as gif format **not** supported in LaTeX: "Animation of Clock algorithm for page replacement"
  (See HTML presentation instead.)
  - Notice: No license displayed for figure → License of document applies
- The song Enthusiast by Tours is licensed under Creative Commons Attribution 3.0 Unported (CC BY 3.0)

Figure with Caption and License

- Display image with meta-data specified in file
  - Simplify sharing of images with source and license
- Functionality and meta-data format are specific to `emacs-reveal`
  - See next slide for sample file

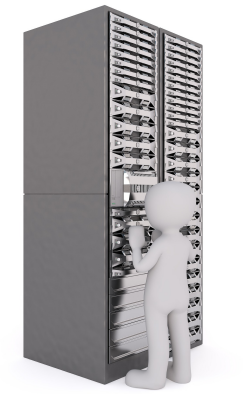
Figure 5: To share or not to share (“Figure” under CC0 1.0; converted from Pixabay)

Meta-Data File for Previous Image

```
;; Semicolon starts comment until end of line (Emacs Lisp).
;; Note that the line for dc:title below is just a comment.  In that
;; case, "Image" is used as generic title; uncomment for real title.
;; CC0 does not require attribution of author/creator; uncomment if needed.

((filename . "./figures/3d-man/decision-1013751_1920.jpg") ; Note the path prefix
; (dc:title . "The title given by the author")
 (licenseurl . "https://creativecommons.org/publicdomain/zero/1.0/")
 (licensetext . "CC0 1.0")
; (cc:attributionName . "Jens Lechtenbörger")
; (cc:attributionURL . "https://lechten.gitlab.io/#me")
 (dc:source . "https://pixabay.com/en/decision-question-response-1013751/")
 (sourcetext . "Pixabay")
 (imgalt . "Balance tipping in favor of Yes")
 (imgadapted . "converted from") ; Adjust as needed
 (texwidth . 0.5) ; Width in percent of textwidth for LaTeX export
)
```

An Image Grid: Computers



(a) Figure under CC0 1.0

(b) Figure under CC0 1.0

(c) Figure under CC0 1.0

(d) Figure under CC0 1.0

(e) Figure under CC0 1.0

(f) Figure under CC0 1.0

(g) Figure under CC0 1.0

(h) Figure under CC0 1.0

(i) Figure under CC BY-SA 4.0

Creation of Previous Image Grid

- Single line in source file, using macro `revealgrid`

  ```
  {{{revealgrid(42,"./figures/devices/computer.grid",60,4,3,"\"ga1 ga2 ga2 ga3\" \"ga1 g
  ```

  - Arguments explained in config.org of oer-reveal
  - With file `computer.grid` as follows

    ```
    ("./figures/devices/white-male-1834091_1920.meta"
     "./figures/devices/commodore-160186_1280-CC0.meta"
     "./figures/devices/laptop-154091_1280.meta"
     "./figures/devices/router-157597_1280.meta"
     "./figures/devices/car-49278_960_720.meta"
     "./figures/devices/beauty-1260974_1920.meta"
     "./figures/devices/vintage-tv-1116587_960_720.meta"
     "./figures/devices/smartwatch-1874536_1280.meta"
     "./figures/devices/Fairphone_2_reverse.meta")
    ```

Notes on figures

- If you used emacs-reveal previously and did not like that it exported all figures from a growing repository, note that as of emacs-reveal 5.2.0, only used figures are exported
- So far, emacs-reveal uses meta-data in an ad-hoc format (as shown on a previous slide)
  - For all figures in this repository
  - Please, contact me if you'd like to contribute with a different format, e.g., JSON-LD
    * Maybe with an issue?

Appearing Items with Audio

(Audios produced with MaryTTS, converted to Ogg format with Audacity)

- One
- Two
- Three

Misc

Quiz Plugin

- `Emacs-reveal` embeds this quiz plugin
  - Demo of plugin's author
- In presentations, quizzes support active learning
  - In particular, retrieval practice

Sample Quiz

Klipse for Code Evaluation

- Org-re-reveal supports Klipse
  - Teach programming
    * Code changes in upper part result in output changes in lower part
  - Browser-side code evaluation for various programming languages
    * See `org-re-reveal-klipse-languages` for supported subset
      · clojure, html, javascript, js, php, python, ruby, scheme, sql
    * To activate, either add option `reveal_klipsify_src:t` (as in header of this file) or set variable `org-re-reveal-klipsify-src` to `t`; be sure to disable scaling of reveal.js
    * Correct indentation may require that you set `org-src-preserve-indentation` to `t` (see bottom of this file)
- Code on next two slides copied from README of Org-Reveal

HTML Src Block

```
<h1 class="whatever">hello, what's your name</h1>
```

Javascript Src Block

```
console.log("success");
var x='string using single quote';
x
```

Python Src Block

```
def factorial(n):
    if n < 2:
return 1
    else:
return n * factorial(n - 1)

print(factorial(10))
```

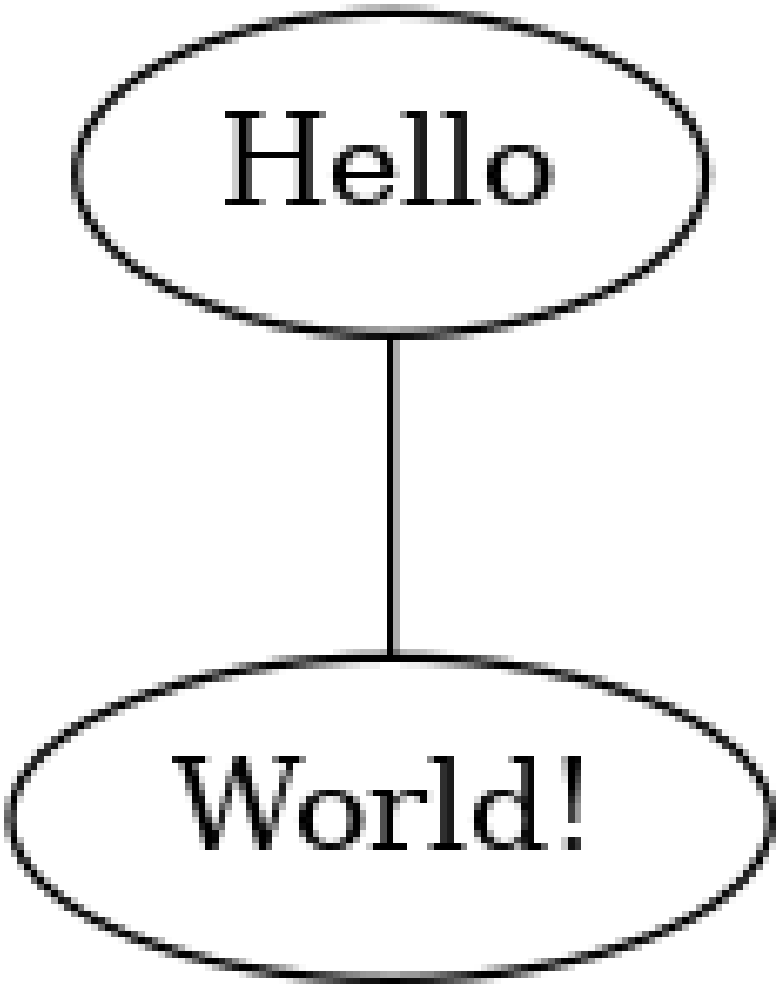
Figures with Babel

- Org export can execute embedded source code, with results injected into exported HTML presentation
  - For example, diagrams generated with `dot` of Graphviz
- With emacs-reveal
  - Activate necessary source languages in `oer-reveal-publish-babel-languages`
  - Maybe generate figures into separate directory
    - Publish contents with `org-publish-project-alist`
- See subsequent slides for sample code

Hello World with Dot

```
graph {
  hello [label="Hello"];
  world [label="World!"];

  hello -- world;
  }
```



Relevant Excerpt of Publication Code

- The following snippet of `elisp/publish.el` activates `dot` and publication of generated images
  - Adapt based on your needs
    - Note that necessary directories must exist (Babel does not create them)

```
(make-directory "img" t)
(setq oer-reveal-publish-babel-languages '((dot . t) (emacs-lisp . t))
    org-publish-project-alist
    (list (list "img"
:base-directory "img"
:base-extension "png"
:publishing-function 'org-publish-attachment
:publishing-directory "./public/img")))
```

Need Additional Software in Publication Process?

- Maybe suggest as issue for Docker image of emacs-reveal
- Or install additional software in Docker container of your project with `before_script`

The End

Further Reading

- Quickstart for Org mode
- Presentations for a course on Operating Systems
  - My first use case for emacs-reveal
  - More features of Org mode (e.g., table of contents as agenda, keyword index) and reveal.js (e.g., notes, animated SVGs)

Go for it!

Figure 7: The road ahead . . . ("Figure" under CC0 1.0; converted from Pixabay)

`https://gitlab.com/oer/`

Bibliography

Lechtenbörger, Jens. 2019a. "Emacs-reveal: A software bundle to create OER presentations." *Journal of Open Source Education (Jose)* 2 (18). `https://doi.org/10.21105/jose.00050`.

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