How to create presentations with emacs-reveal *

This is only a fork as GitLab Pages demo. Real and current Howto.

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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
    - Press "?" to see key bindings of reveal.js
      - In general, "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 slide's number followed by Enter to jump to that slide
    - Browser history
    - 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 HTML page; 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 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

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
        * See top of the source code of this howto
    - In particular, it includes the CSS code `helper.css` for the accessibility plugin (that is activated by default with emacs-reveal)

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

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

Presentation contains image grid. LaTeX export not supported.

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))
```

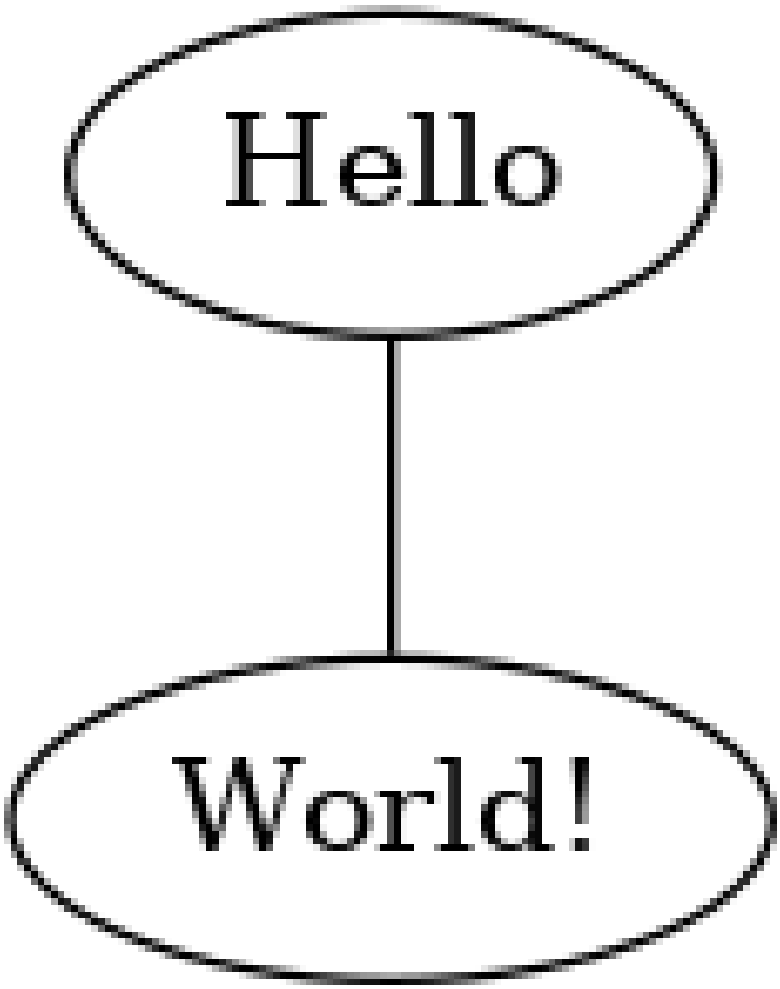
Figures with Babel

- 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 6: 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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