

Copie de diffusion et de conservation autorisée par la licence CC BY-NC-SA
Diffusé par le Centre de documentation collégiale au EDUQ.info
36 p. PDF

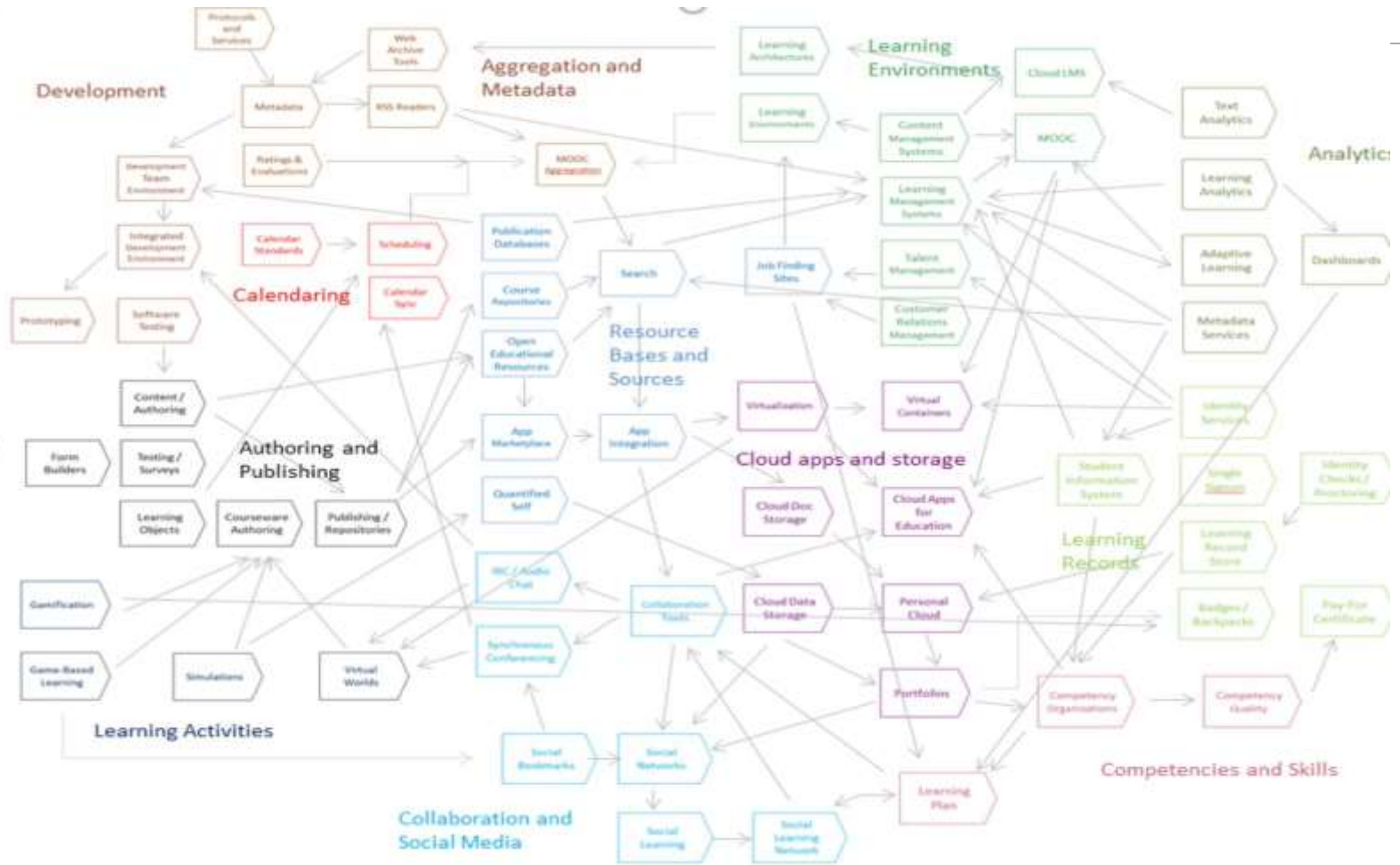


Applications, Algorithms and Data: Open Educational Resources and the Next Generation of Virtual Learning

Stephen Downes
RELIF
Hammamet, Tunisia
November 30, 2017

<http://www.downes.ca/presentation/481>

State of the Art



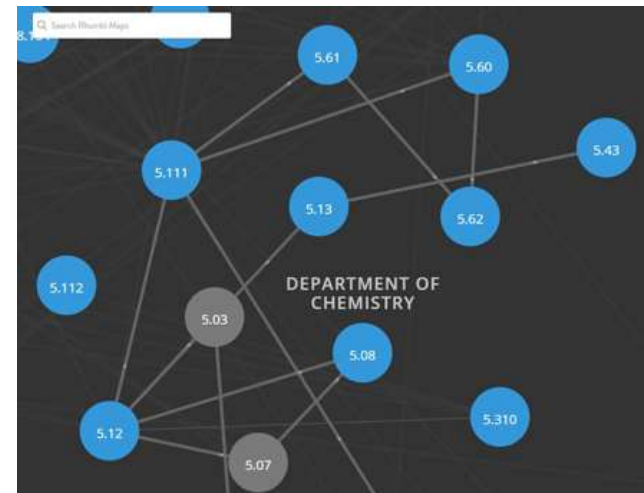
OER Repositories



<https://www.oercommons.org/>



<https://openstax.org/>



<https://ocw.mit.edu/>

OERs are now widely available through subject-specific libraries with provisions for authoring as well

<http://irsc.libguides.com/openeducationalresources/oerrepositories>

Open Resources, Open Teaching

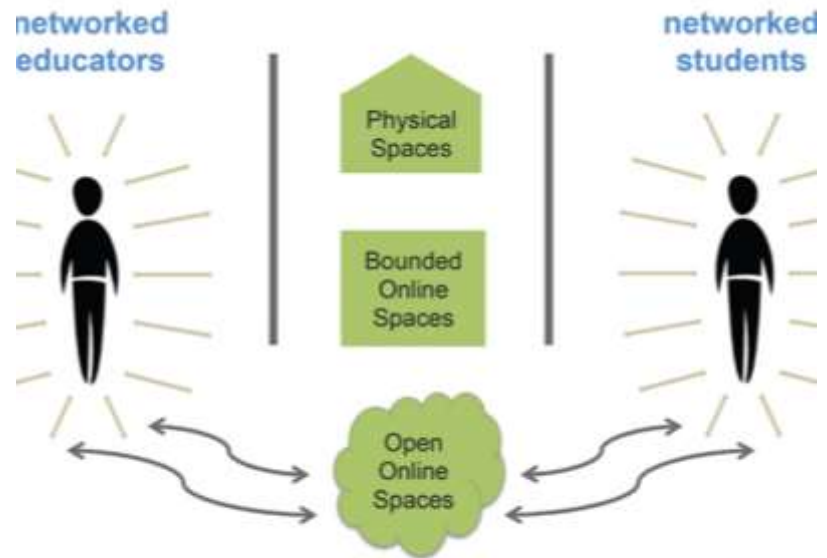
Open Pedagogy – Using OER to Change How We Teach – Heather Ross

<https://words.usask.ca/gmcte/2016/09/26/open-pedagogy-using-oer-to-change-how-we-teach/>

Open Education, Open Questions – Catherine Cronin

<https://er.educause.edu/articles/2017/10/open-education-open-questions>

“The use of open practices by learners and educators is complex, personal, and contextual; it is also continually negotiated.”



1. A Model for Networked Education (Credit: Image by Catherine Cronin ^{CS}, building on *Networked Teacher* ^{CS} by Alec Couros. CC BY-SA)

OERs as Student Production

DS106 – assignment bank
<http://assignments.ds106.us/>

Domain of One's Own -
<https://reclaimhosting.com/domain-of-ones-own/>

Creation of OERs through 'renewable assignments' – Christina Hendricks
<http://flexible.learning.ubc.ca/news-events/renewable-assignments-student-work-adding-value-to-the-world/>



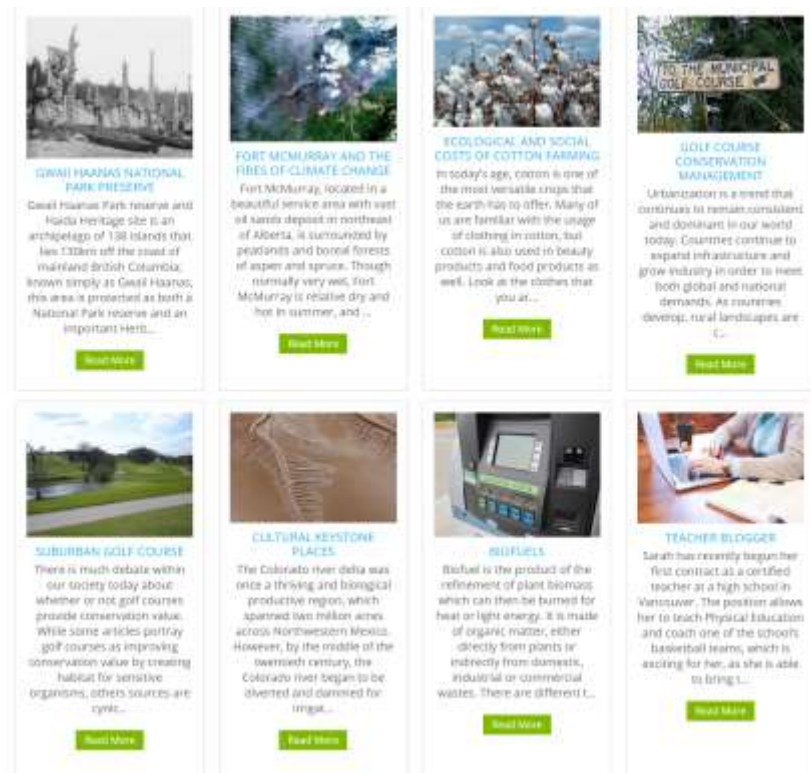
Open Case Studies

Case studies that can be used by anyone, at UBC or elsewhere.

Many focus on topics in sustainability

cases on this site are open educational resources: they have an open license to allow for revision and reuse of the cases in other courses and contexts

Quoted from: <http://cases.open.ubc.ca/>



GUWAJ HAANAS NATIONAL PARK PRESERVE
Gwa'alaan Park reserve and Haida Heritage Site is an archipelago of 138 islands that lies 130km off the coast of mainland British Columbia, known simply as Gwa'alaan; this area is protected as both a National Park reserve and an Important Herb...

FORT McMURRAY AND THE RIBES OF CLIMATE CHANGE
Fort McMurray, located in a beautiful service area with vast oil sands deposit in northwest of Alberta, is surrounded by peatlands and boreal forests of aspen and spruce. Though normally very wet, Fort McMurray is relative dry and hot in summer, and ...

ECOLOGICAL AND SOCIAL COSTS OF COTTON FARMING
In today's age, cotton is one of the most versatile crops that the earth has to offer. Many of us are familiar with the usage of clothing in cotton, but cotton is also used in beauty products and food products as well. Look at the clothes that you at...

GOLF COURSE CONSERVATION MANAGEMENT
Urbanization is a trend that continues to remain consistent and dominant in our world today. Countries continue to expand infrastructure and grow industry in order to meet both global and national demands. As countries develop, rural landscapes are ...

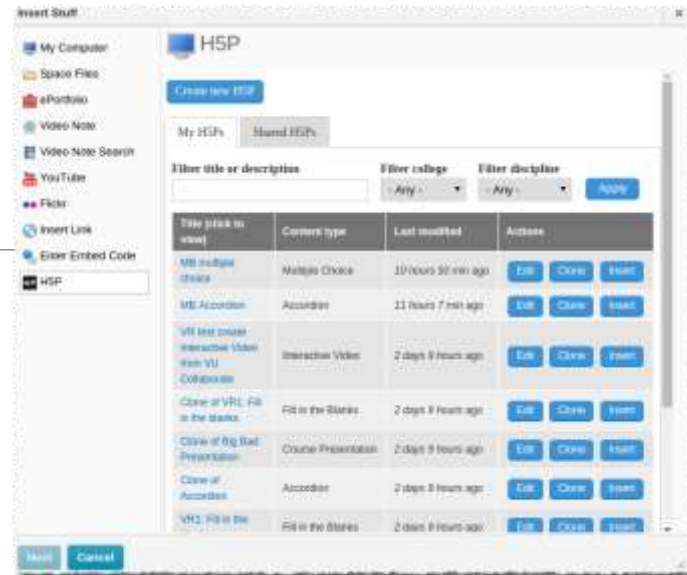
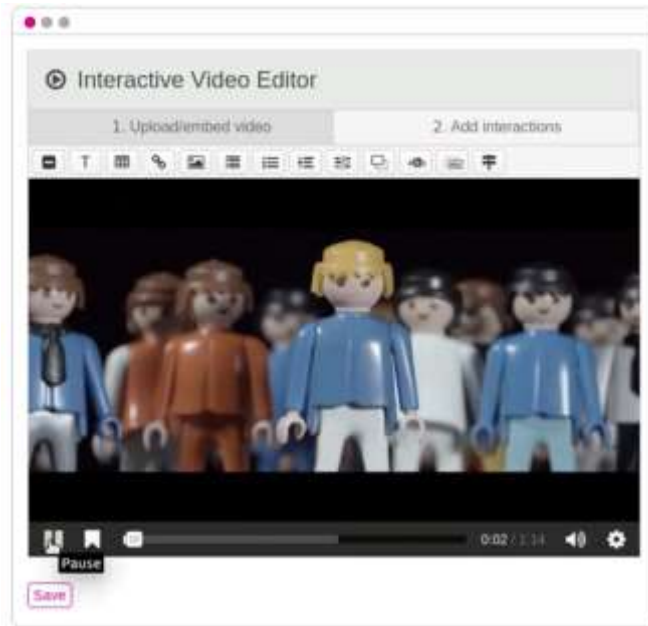
SUBURBAN GOLF COURSE
There is much debate within our society today about whether or not golf courses provide conservation value. While some articles portray golf courses as improving conservation value by creating habitat for sensitive organisms, others sources are ...

CULTURAL KEystone PLACES
The Colorado river delta was once a thriving and biological productive region, which spanned ten million acres across Northwestern Mexico. However, by the middle of the twentieth century, the Colorado river began to be diverted and dammed for ...

BIOFUELS
Biofuel is the product of the refinement of plant biomass, which can then be burned for heat or light energy. It is made of organic matter, either directly from plants or indirectly from domestic, industrial or commercial wastes. There are different ...

TEACHER BLOGGER
Sarah has recently begun her first contract as a certified teacher at a high school in Vancouver. The position allows her to teach Physical Education and coach one of the schools basketball teams, which is exciting for her, as she is able to bring ...

H5P



<https://h5p.org/h5p-plus-brightspace-equals-smashing-interactive-learning>

H5P is an abbreviation for HTML5 Package, and aims to make it easy for everyone to create, share and reuse interactive HTML5 content. – Wikipedia

<https://en.wikipedia.org/wiki/H5P>

H5P is available as a Moodle plugin, a Drupal module and a WordPress plugin. <https://h5p.org/>

Content Syndication

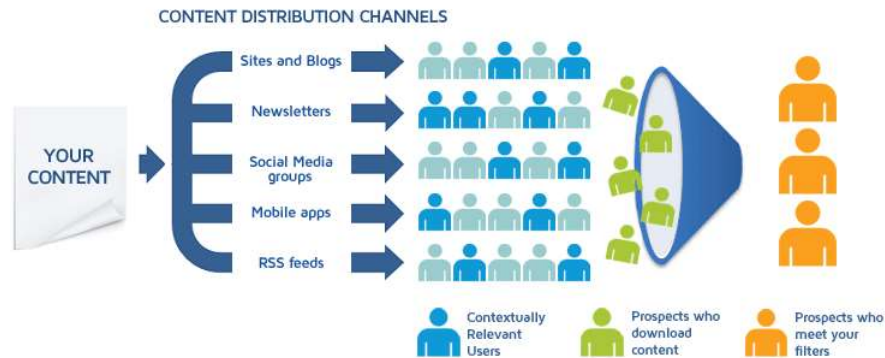


Image:

<https://blog.izooto.com/best-content-syndication-tools/>

Blog posts and comments were the core of CCK08

- gRSShopper – <http://grsshopper.downes.ca>

FeedPress - <https://wordpress.org/plugins/feedpress/>

FeedBurner - <https://feedburner.google.com>

Scrapy

```
Terminal
$ pip install scrapy
$ cat > myspider.py <<EOF
import scrapy

class BlogSpider(scrapy.Spider):
    name = 'blogspider'
    start_urls = ['https://blog.scrapinghub.com']

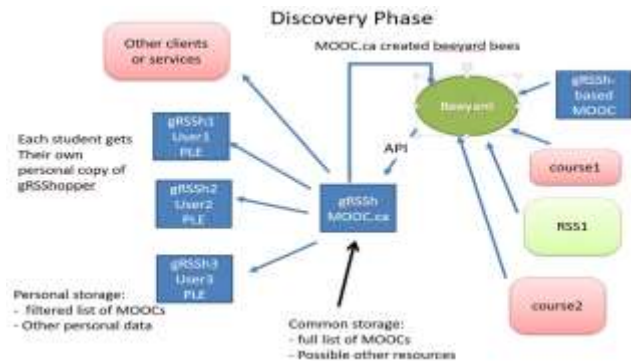
    def parse(self, response):
        for title in response.css('h2.entry-title'):
            yield {'title': title.css('a ::text').extract_first()}

        for next_page in response.css('div.prev-post > a'):
            yield response.follow(next_page, self.parse)
EOF
$ scrapy runspider myspider.py
```

<https://scrapy.org/>

Python framework to aggregate and store content in RSS feeds and web sites

Forms the core of the NRC-developed 'Beeyard' application



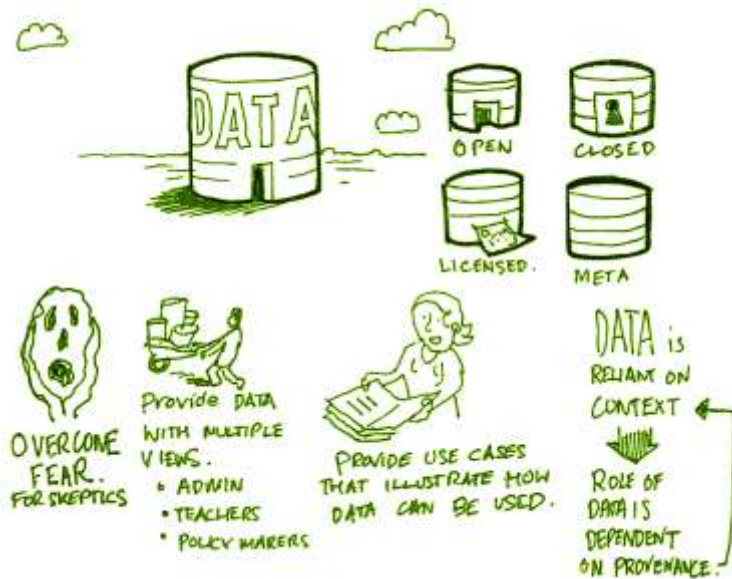
MOOC.ca and gRSShopper



<http://grsshopper.downes.ca/>

www.mooc.ca is an aggregator of MOOC course offerings (and is planned to aggregate OERs as well) using gRSShopper and Beeyard

Open Data as OERs



Civic engagement in Italy

Into programming assignments

Article-level metrics

Geodata and Land Walks in Wales

Open data for sustainable development

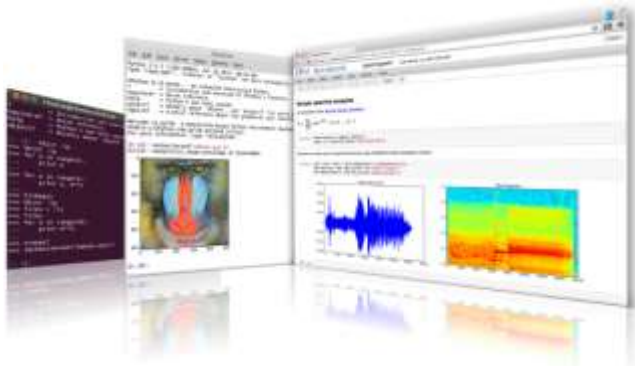
Atenas, J., & Havemann, L. (Eds.). (2015). Open Data as Open Educational Resources: Case studies of emerging practice. London: Open Knowledge, Open Education Working Group. <http://dx.doi.org/10.6084/m9.figshare.1590031>
Also: Leo Havemann, slides http://eprints.bbk.ac.uk/14750/1/Leo_ODasOER_UCL_4March16.pdf

CodePen



<https://codepen.io/caraujo/pen/LVPzxO>

iPython and Jupyter



iPython is an interactive programming shell for the Python programming language <https://ipython.org/>



The Jupyter Notebook is an open-source web application that allows you to create and share documents that contain live code... <http://jupyter.org/>

A gallery of Jupyter Notebooks

```
In [4]: my @svg = split ' ', q[
        https://upload.wikimedia.org/wikipedia/commons/f/fd/G
        https://upload.wikimedia.org/wikipedia/commons/f/f9/L
        ];
        IPerl->display( IPerl->svg( $_ , width => "200" ) ) for @svg;
        $png_display;
```



<https://github.com/jupyter/jupyter/wiki/A-gallery-of-interesting-Jupyter-Notebooks#machine-learning-statistics-and-probability>

... and more ...

Linguistics and Text Mining

- [Workshop on text analysis](#) by Neal Caren.
- [Detecting Algorithmically Generated Domains](#), part of the [Data Hacking](#) collection on security-oriented data analysis with IPython & friends.
- [Mining the Social Web \(2nd Edition\)](#). A complete collection of notebooks accompanying Matthew Russel's book by O'Reilly.

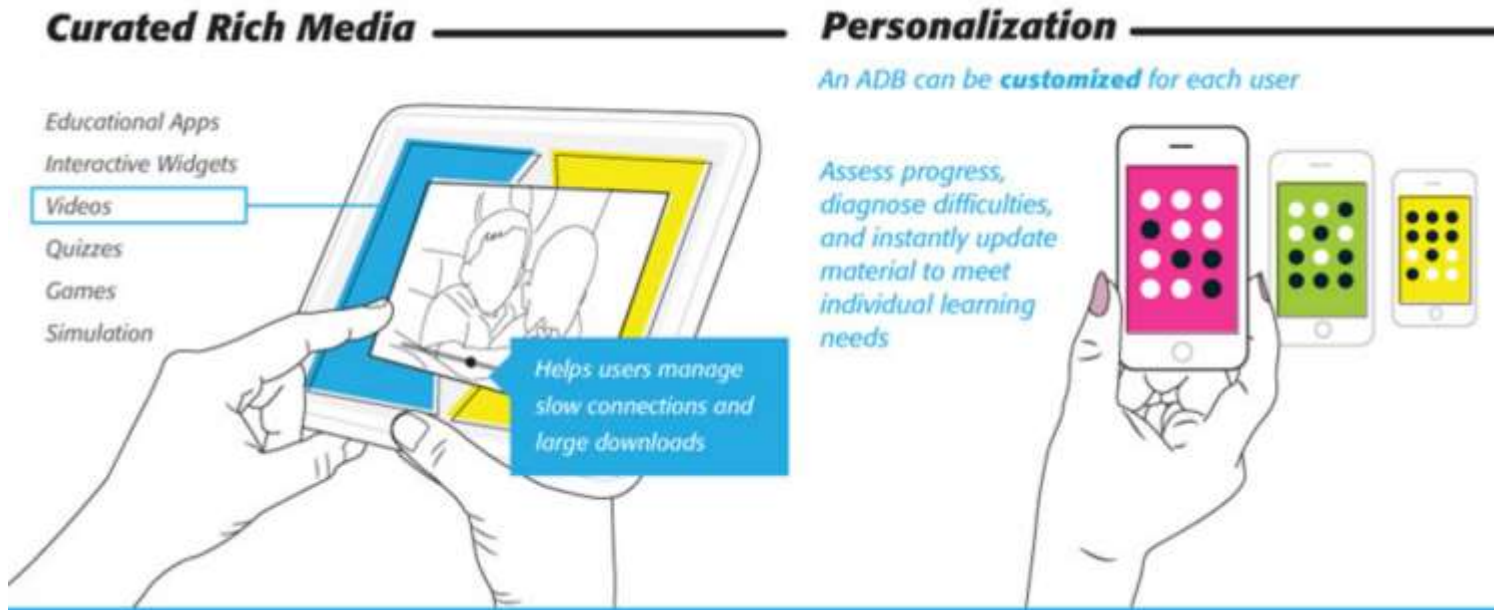
Signal Processing

- [Sound Analysis with the Fourier Transform](#). A set of IPython Notebooks by [Caleb Madrigal](#) to explain what the Fourier Transform is and how to use it for basic audio processing applications.
- [An introduction to Compressed Sensing](#), part of [Python for Signal Processing](#): an entire book (and blog) on the subject by Jose Unpingco. [@dsd](#)
- [Kalman and Bayesian Filters in Python](#). A textbook and accompanying filtering library on the topic of Kalman filtering and other related Bayesian filtering techniques.
- [Classify human movements using Dynamic Time Warping & K Nearest Neighbors](#): Signals from a smart phone gyroscope and accelerometer are used to classify if the person is running, walking, sitting standing etc. This IPython notebook contains a python implementation of DTW and KNN algorithms along with explanations and a practical application.
- [Digital Signal Processing](#) A collection of notebooks that accompanies a masters course on the topic.
- [An introduction to openCV](#) An introduction course into using openCV for computer vision in python

Engineering Education

- [Introduction to Chemical Engineering Analysis](#) by Jeff Kantor. A collection of IPython notebooks illustrating topics in introductory chemical engineering analysis including

Actionable Data Book



“... mobile technology, experiential analytics, and rich media, delivered through interactive eBook technology.”

<https://standards.ieee.org/develop/indconn/adb/index.html>

The IEEE Actionable Data Book and EPUB 3

<https://www.slideshare.net/JohnBCosta/adb-brief-for-edupub-2014>

XAMPP



“XAMPP is a completely free, easy to install Apache distribution containing MariaDB, PHP, and Perl. The XAMPP open source package has been set up to be incredibly easy to install and to use.”



XAMPP on a USB Stick

<https://portableapps.com/apps/development/xampp>

<https://willtan.com/installing-xampp-on-usb-flash-drive/>

<https://www.apachefriends.org/index.html>

Spoodle

“Spoodle is an up to date portable moodle / ‘moodle on a stick’ solution for learners to access Moodle courses without requiring constant internet access.”

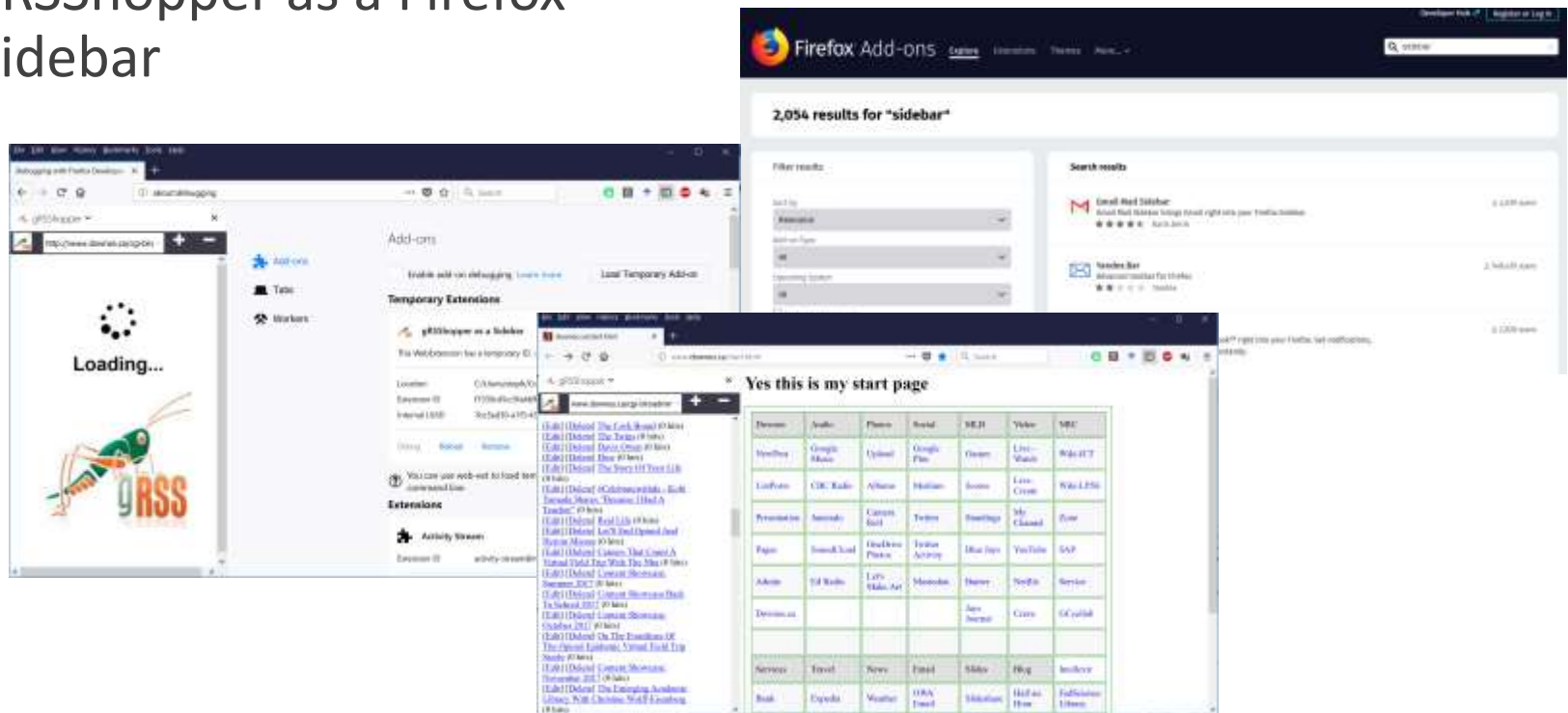


<https://moodle.org/mod/forum/discuss.php?d=342367>

<https://www.youtube.com/watch?v=EsHEgSYKr4A>

Applications in Other Applications

gRSShopper as a Firefox Sidebar



<https://addons.mozilla.org/en-US/firefox/search/?q=sidebar&platform=WINNT&appver=58.0>

Applications in Other Applications

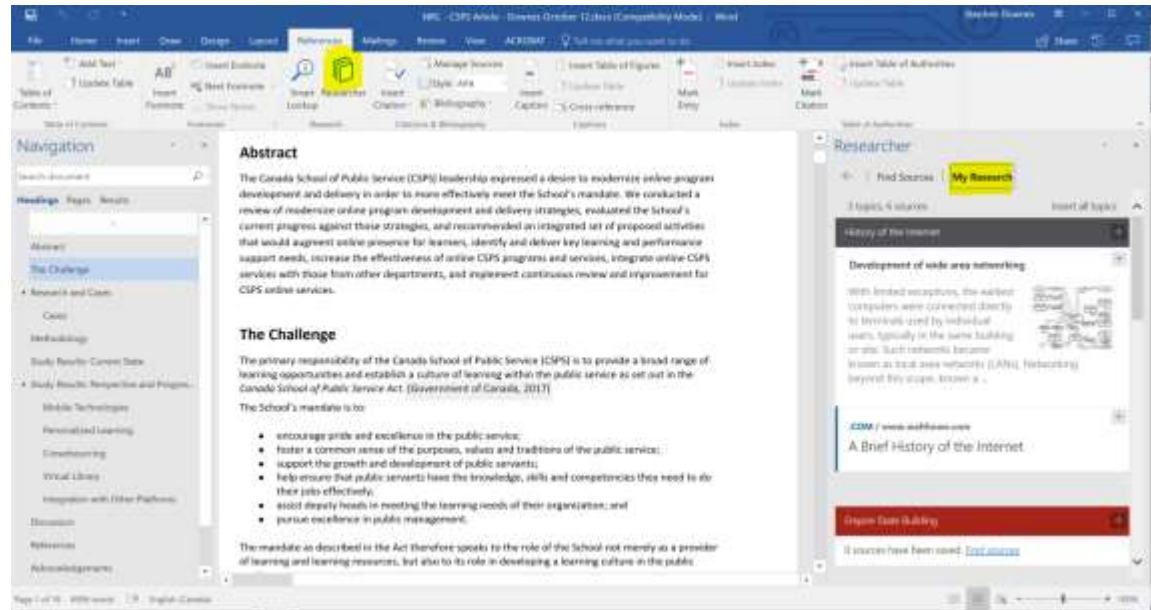
gRSShopper in Vivaldi

The image shows a Vivaldi browser window with two overlapping windows. The background window is a YouTube page for a video titled "The Twins" by Discovery Education, published on May 5, 2017. The video features a young boy with a large afro hairstyle wearing a blue t-shirt with the name "LUCAS" on it. The video has 1,400 views. The foreground window is the gRSShopper application, which is a web-based RSS feed reader. It shows a list of links on the left side, including "The Cook Board", "The Twins", "Diva Ocean", "How", "The Story Of Your Life", "Celebrate withale", "Kobi Yamashita Shares 'Because I Had A Teacher'", "Real Life", "Lori's Final Opus", "And Heron Slaves", "A Yarnal Field Trip With The Nba", "Content Showcase, Summer 2017", and "The Cook Board". The main content area of gRSShopper displays a post from "CogDogBlog" with the title "On Transformations" and a URL "http://cogdogblog.com/2017/11/on-transformations/". The post content includes a paragraph about a special evening in Melbourne and a paragraph about the International Specialised Skills Institute Fellowship Awards Ceremony. The gRSShopper interface includes a search bar, a list of links, and a main content area.

<https://vivaldi.com/>

Applications in Other Applications

Research and References in an MS-Word Plugin



https://www.officetooltips.com/office_2013/tips/advanced_research_with_research_pane.html

Server Virtualization

Parallels -

<https://www.parallels.com/>

VMWare -

<https://www.vmware.com/>

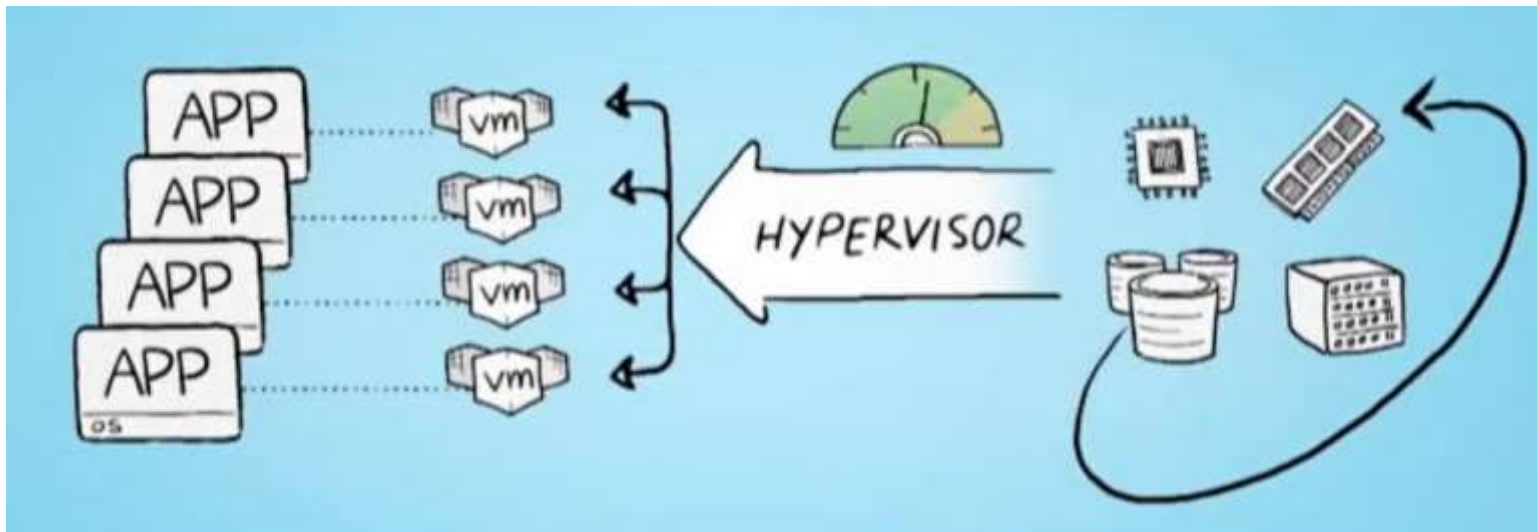
XenServer - <https://xenserver.org/>

- Virtual Box -

<https://www.virtualbox.org/>

- Hyper-V -

<https://docs.microsoft.com/en-us/virtualization/hyper-v-on-windows/quick-start/enable-hyper-v>



Virtualization Platforms - Vagrant

```
$ vagrant init hashicorp/precise64

$ vagrant up
Bringing machine 'default' up with 'virtualbox' provider.
==> default: Importing base box 'hashicorp/precise64'...
==> default: Forwarding ports...
default: 22 (guest) => 2222 (host) (adapter 1)
==> default: Waiting for machine to boot...

$ vagrant ssh
vagrant@precise64:~$ _
```



<https://www.vagrantup.com/>

Loading and Running Vagrant

Scotch Box

- <https://box.scotch.io/> -- <http://192.168.33.10/>
- WPDistillery - <https://wpdistillery.org/> - for WordPress

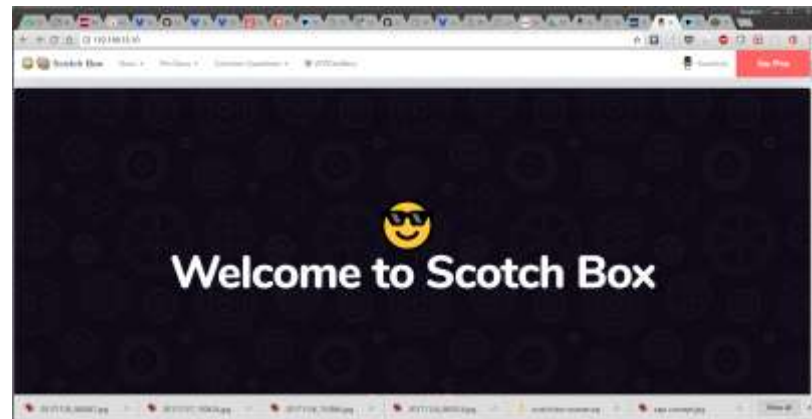
Homestead

- Instructions - <https://laravel.com/docs/5.5/homestead#first-steps>

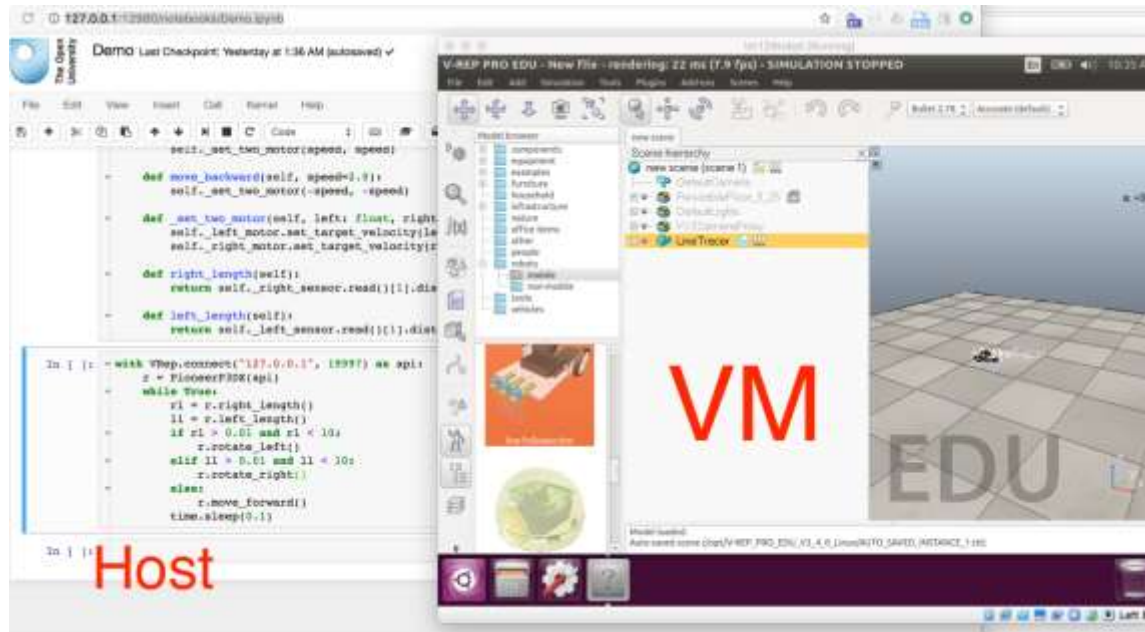
```
Command Prompt
Directory of C:\Users\steph\CodeProjects\Vagrant\lamp:
11/27/2017  04:17 PM  <DIR>          .
11/27/2017  04:17 PM  <DIR>          ..
11/27/2017  04:17 PM  <DIR>          -vagrant-
11/27/2017  04:17 PM                3,889 VagrantFile
                1 KB(s)          1,000 bytes
                3 KB(s)          324,798,441 bytes free

C:\Users\steph\CodeProjects\Vagrant\lamp> ..\scotchbox

C:\Users\steph\CodeProjects\Vagrant\scotchbox>vagrant up
Bringing machine 'default' up with 'virtualbox' provider...
=> default: box 'scotch/box' could not be found. Attempting to find and install...
   default: Box Provider: virtualbox
   default: Box Version: >= 0
=> default: Loading metadata for box 'scotch/box'
   default: URL: https://vagrantcloud.com/scotch/box
=> default: Adding box 'scotch/box' (v1.0) for provider: virtualbox
   default: Downloading: https://vagrantcloud.com/scotch/boxes/box/versions/1.0/providers/virtualbox.box
   default:
=> default: Successfully added box 'scotch/box' (v1.0) for 'virtualbox'
=> default: Importing base box 'scotch/box'...
=> default: Matching MAC address for NAT networking...
=> default: Checking if box 'scotch/box' is up to date...
=> default: Setting the name of the VM: scotchbox_default_1311952861336_42386
=> default: Cleaning any previously set network interfaces...
=> default: Preparing network interfaces based on configuration...
   default: Adapter 1: nat
```



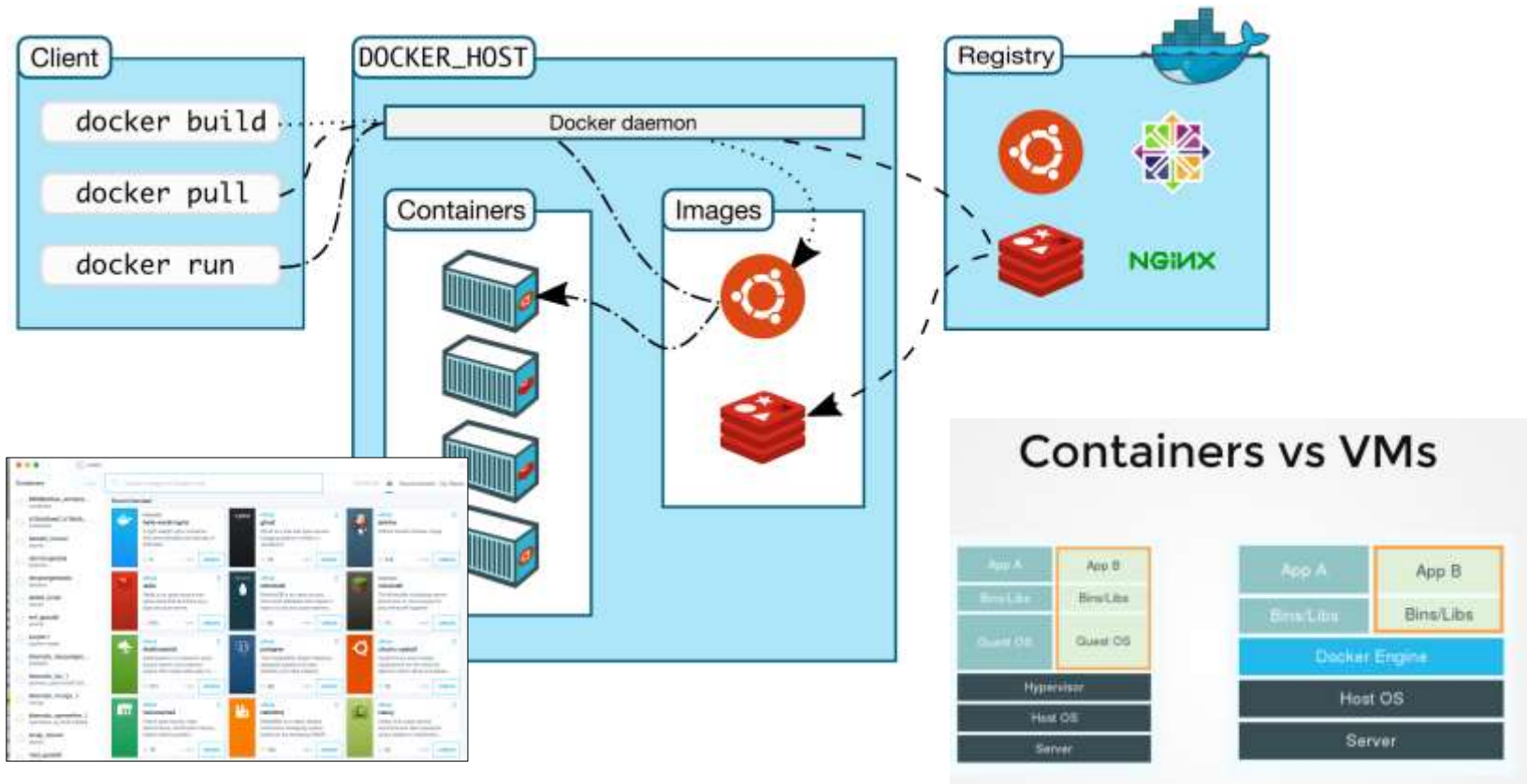
Vagrant as Learning Environment



Distributing Virtual Machines That Include a Virtual Desktop To Students – V-REP + Jupyter Notebooks – Tony Hirst

<https://blog.ouseful.info/2017/09/10/distributing-virtual-machines-that-include-a-virtual-desktop-to-students-v-rep-jupyter-notebooks/>

Docker



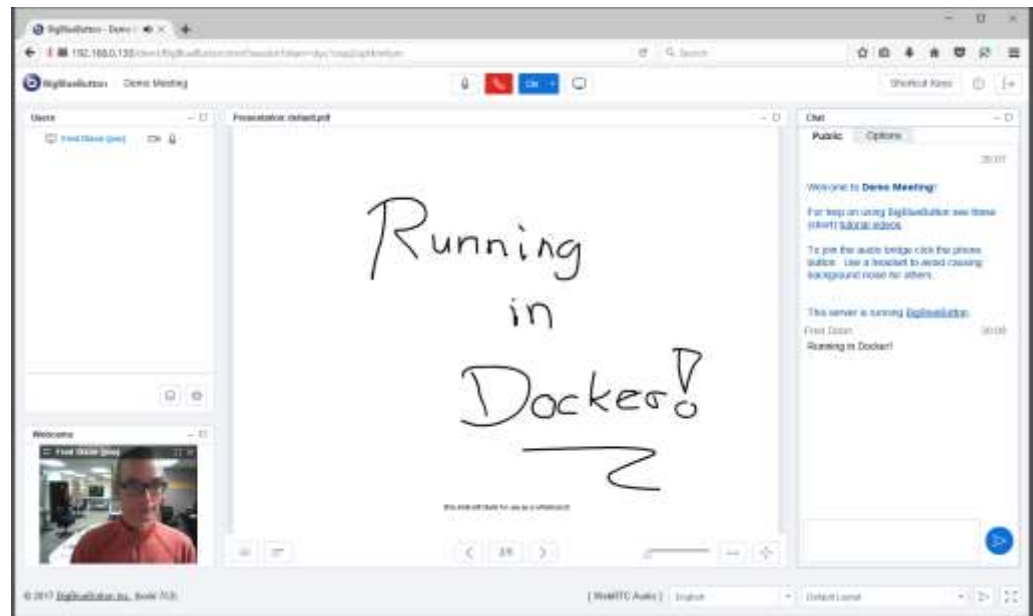
Big Blue Button in Docker

Docker Pull Command

```
docker pull bigbluebutton/bigbluebutton
```

Owner

 bigbluebutton



<http://docs.bigbluebutton.org/labs/docker.html>

<https://hub.docker.com/r/bigbluebutton/bigbluebutton/>

Moodle on Docker

docker-moodle No Maintenance Intended ✖

A Dockerfile that installs and runs the latest Moodle stable.

Installation

```
git clone https://github.com/jda/docker-moodle
cd docker-moodle
docker build -t moodle .
```

Usage

To spawn a new instance of Moodle:

```
docker run -d --name DB -p 3306:3306 -e MYSQL_D
docker run -d -P --name moodle --link DB:DB -e M
```

You can visit the following URL in a browser to get started:

<http://192.168.59.103:8080>

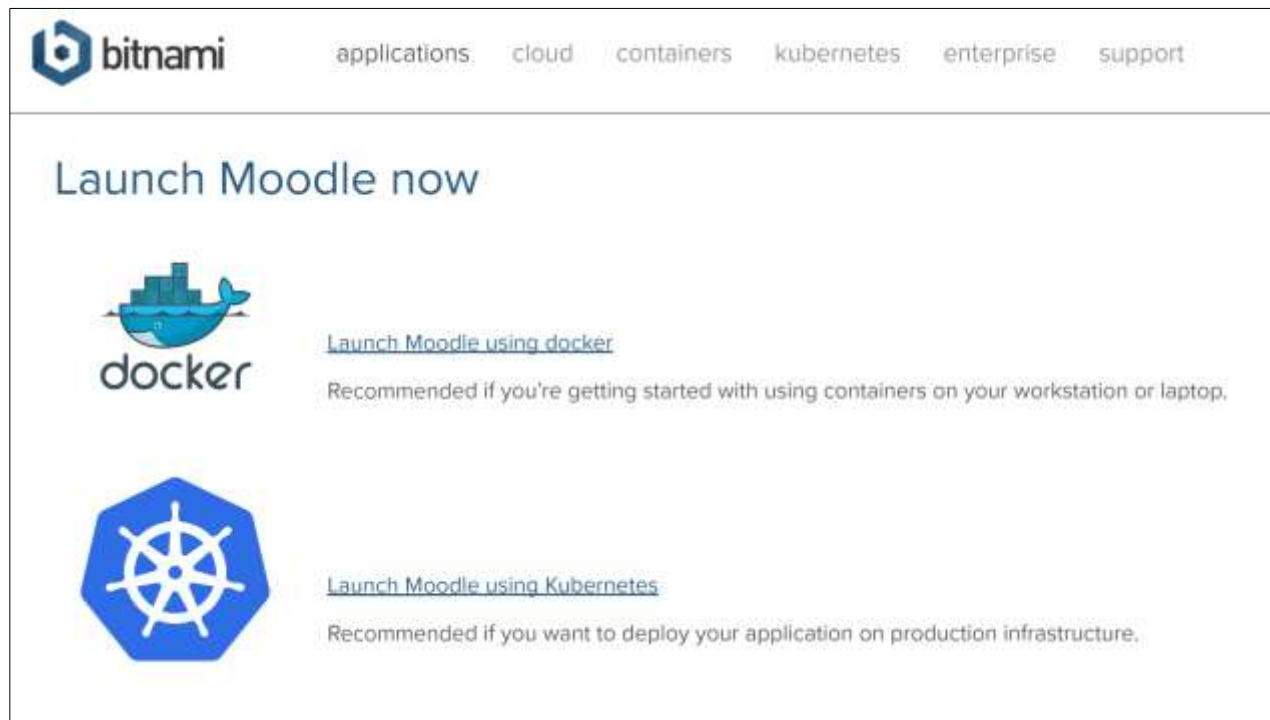


The screenshot shows the Moodle administration interface. The top navigation bar includes the Moodle logo, the user name "Admin User", and a "Logout" link. The breadcrumb trail is "Moodle > Administration > Modules > Activities". The left sidebar contains "Site Administration" and "Admin bookmarks". The main content area displays a table of activities.

Activity module	Activities	Version	Hide/Show	Delete	Settings
Assignment	0	2007020200		Delete	Settings
Chat	0	2007020200		Delete	Settings
Choice	0	2007020200		Delete	Settings
Database	0	2007022601		Delete	Settings
Forum	0	2007020202			Settings
Glossary	0	2007020200		Delete	Settings
Hot Potatoes Quiz	0	2007020202		Delete	Settings
Journal	0	2007020200		Delete	
LAMS	0	2007020200		Delete	Settings
Label	0	2007020200		Delete	
Lesson	0	2007020201		Delete	
Quiz	0	2007020200		Delete	Settings
Resource	0	2007020200		Delete	Settings
SCORM/AICC	0	2007070300		Delete	Settings
Survey	0	2007020200		Delete	
Wiki	0	2007020200		Delete	
Workshop	0	2007020200		Delete	

<https://hub.docker.com/r/jauer/moodle/>


Options




The screenshot shows the Bitnami website's navigation bar with links for applications, cloud, containers, kubernetes, enterprise, and support. Below the navigation bar, the heading "Launch Moodle now" is displayed. Two options are listed: "Launch Moodle using docker" with the Docker logo and a recommendation for workstation or laptop use, and "Launch Moodle using Kubernetes" with the Kubernetes logo and a recommendation for production infrastructure.

bitnami applications cloud containers kubernetes enterprise support

Launch Moodle now


docker

[Launch Moodle using docker](#)
Recommended if you're getting started with using containers on your workstation or laptop.



[Launch Moodle using Kubernetes](#)
Recommended if you want to deploy your application on production infrastructure.

<https://bitnami.com/stack/moodle/containers>

Cloud Infrastructure Providers



AWS – Amazon - <https://aws.amazon.com/>



Azure – Microsoft - <https://azure.microsoft.com>



Bluemix – IBM Cloud - <https://www.ibm.com/cloud/>



Google Cloud Platform - <https://cloud.google.com/>



Oracle Cloud - <https://cloud.oracle.com/>



<https://www.srgresearch.com/articles/microsoft-google-and-ibm-charge-public-cloud-expense-smaller-providers>

Cloud Computing for Education

The screenshot shows the AWS Education website layout. At the top, there are two banners: 'How To Buy Cloud' with a 'Learn More >' button, and 'AWS PUBLIC SECTOR SUMMIT' with a 'View Keynotes & Sessions >' button. Below these are three main sections:

- Higher Education**: From data center migration to student data and analytics, AWS has agile and flexible solutions. [Learn more >](#)
- K12 & Primary Schools**: Streamline district IT operations, save money, and keep student information safe in the AWS Cloud. [Learn more >](#)
- Ed Tech Companies**: Innovate and build the next generation of online learning, analytics, and campus management solutions. [Learn more >](#)



coursera

echo³⁶⁰
active learning



Amazon Web Services - <https://aws.amazon.com/education/>

OER and Virtualization

Open Distribution of Virtual Containers as a Key Framework for Open Educational Resources and STEAM Subjects Alberto Corbi and Daniel Burgos

<http://www.ejel.org/issue/download.html?idArticle=575>

“Unikernels represent and deeper simplification of the virtual container approach, given that all necessary computing elements (operative system kernel, basic libraries, frameworks, drivers, scientific application, etc.)”

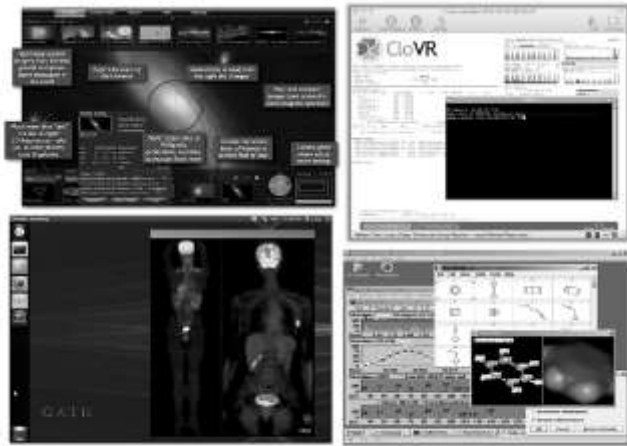


Figure 3: Some educational resources that are distributed as classic virtual machines (WWT, CloVR, vGATE, and a VirtualBox image for chemistry teaching).

Mobile Authoring for ARLearn

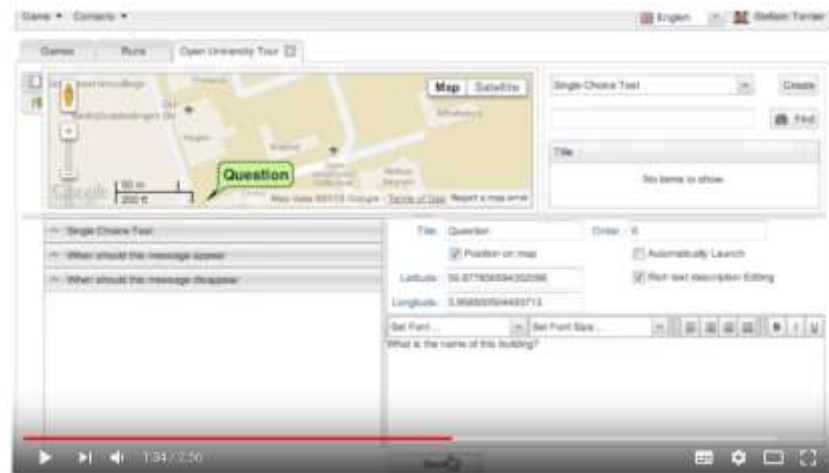
“The Mobile Authoring Tool complements the ARLearn desktop-based environment. Hence, a mobile game author can wander around creating items and synchronizing real world artefacts with game content.”

https://dspace.ou.nl/bitstream/1820/5674/1/UAIS_Tabuenca_2014.pdf

Bernardo Tabuenca; Marco Kalz; Stefaan Ternier; Marcus Specht

ARLearn <http://ar-learn.com/>

ARLearn is a technical framework for creating mobile serious games



<https://www.youtube.com/watch?v=Lqk3yrcNjNI>

Interaction and Access Data

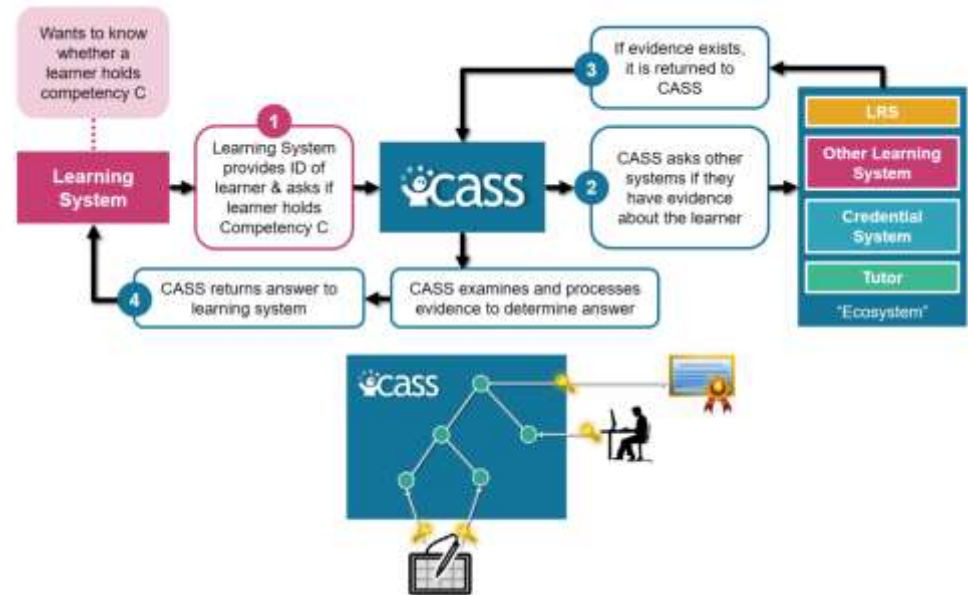
Unlocking Open Educational Resources (OERs)

Interaction Data - David Massart, Elena Shulman

- <http://www.dlib.org/dlib/may13/massart/05massart.html>

Creativity in the Open Workshop

- <http://blogs.ubc.ca/chendricks/>



Advanced Distributed Learning (ADL):

- Competencies and Skills Systems
- Experience API (xAPI)

<https://www.adlnet.gov/xapi/>

Happening Now...

Docker images to build OER

- <https://gitlab.com/oer/docker>

Creativity in the Open Workshop

- <http://blogs.ubc.ca/chendricks/>

Uhack Weekend (Tasmania)

- <http://uhack-guide.readthedocs.io/en/latest/resources/project-hosting/>
- <https://uhack-tasmania-2017.devpost.com/>



Thank You



<http://www.downes.ca>