

# How to become a (Media)Wiki hacker

An overwhelming overview of Wikimedia's many technical areas, some projects, and development infrastructure to get ideas where to get involved.



**WIKIMEDIA**  
FOUNDATION

## What this session is

- An overview of the many technical areas which involve code and its development and the many related programming languages used in the Wikimedia universe
- Some (hopefully) helpful links to more information if an area interests to
- Questions & Answers

## What this session is not

- Not a hands-on workshop to install MediaWiki, to register a developer account or to set up code review workflow etc.
- Not a workshop to learn how to code in some programming language

# Wikipedia, Wikimedia, MediaWiki, Wiki?



**WIKIPEDIA**  
The Free Encyclopedia



**WIKIMEDIA**  
FOUNDATION



**MEDIAWIKI**



**WIKIMEDIA**  
MOVEMENT



**WIKI**

# Mission and Projects

Wikimedia is a global movement whose mission is to bring free, multilingual, and educational content of its wiki-based projects to the world.



## Wikipedia

Free encyclopedia



## Wikibooks

Free textbooks and manuals



## Wikiversity

Free learning tools



## Commons

Shared media repository



## Wiktionary

Dictionary and thesaurus



## Wikiquote

Collection of quotations



## Wikivoyage

Free travel guide



## Wikidata

Free knowledge base



## Wikinews

Free content news source



## Wikisource

Free source documents



## Wikispecies

Directory of species



## MediaWiki

Free wiki software

[https://meta.wikimedia.org/wiki/Our\\_projects](https://meta.wikimedia.org/wiki/Our_projects)

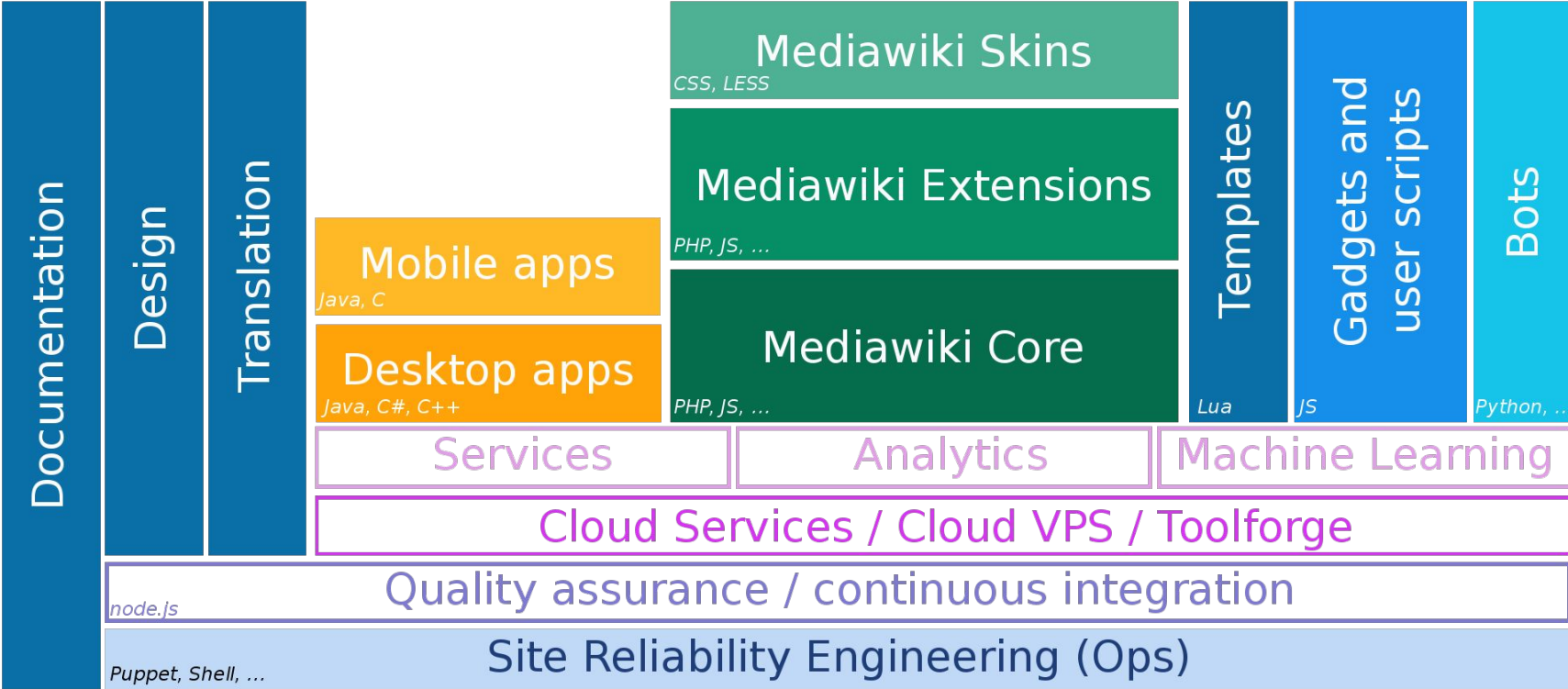
# Infrastructure and tools for development collaboration

- Communication: on-wiki, IRC chat (common among developers), mailing lists:  
<https://www.mediawiki.org/wiki/Communication>
- Tracking and discussing tasks, bugs, enhancement requests in Phabricator:  
<https://www.mediawiki.org/wiki/Phabricator>
- Source code repositories in Git and Code review in Gerrit:  
<https://www.mediawiki.org/wiki/Gerrit>  
(a few projects use Github though, and we also have some code inside of wiki pages)

# Who develops?

- Employees and contractors of Wikimedia Foundation, Wikimedia Deutschland, Wikimedia Sverige, ..., 3rd party companies who use Wikimedia software, volunteers
- Decision making / "ownership" (per organization: annual plans, quarterly goals, etc), <https://www.mediawiki.org/wiki/Developers/Maintainers> as an (incomplete) list
  - Community Wishlist (once a year)
  - For developers: Grants: <https://meta.wikimedia.org/wiki/Grants:Start>
- Some statistics on <https://wikimedia.biterg.io/> (for Git code repositories)

# Wikimedia Technical Areas



# Gadgets and User scripts

## On-wiki scripts that extend functionality

- Site wide: Preferences→Gadgets (when logged in)
- <https://en.wikipedia.org/wiki/Special:GadgetUsage>
- Per user: On [User:YourUserName/common.js](#)
- Skills required: JavaScript
- [https://www.mediawiki.org/wiki/Gadget\\_kitchen](https://www.mediawiki.org/wiki/Gadget_kitchen)
- <https://www.mediawiki.org/wiki/ResourceLoader>



Screenshot of Gadget: Navigation Popups

## Example: QuickPresets

- Wikidata-Gadget that allows to add often used statements with a single click
- Skills required: CSS, JavaScript, Wikibase, etc



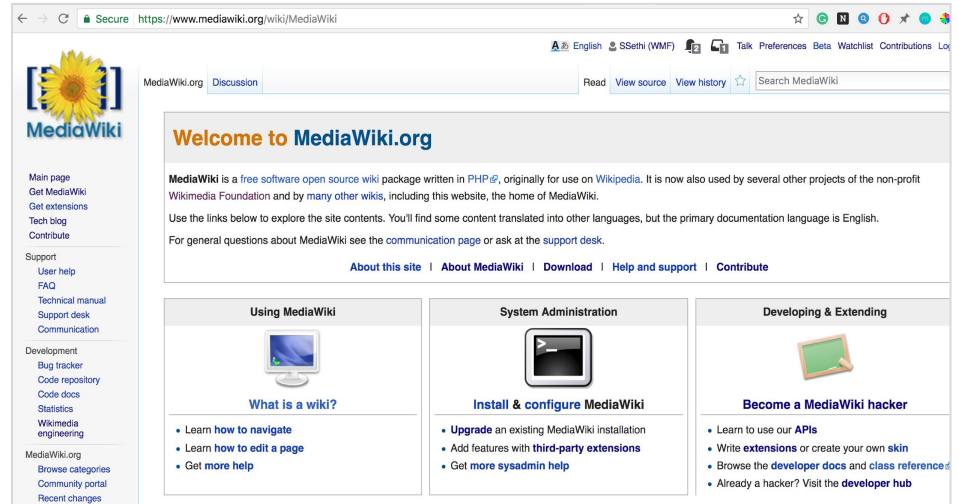
Screenshot of Gadget: QuickPresets



# MediaWiki

The core wiki software / engine

- Started in 2003; >0.5mio lines of code
- Needs web server, database, PHP
- Skills required: PHP, some JS/jQuery
- If you are a new developer, MediaWiki core itself is not a recommended place to start hacking on
- As a development environment: Vagrant, Docker, manual:  
[https://www.mediawiki.org/wiki/How\\_to\\_become\\_a\\_MediaWiki\\_hacker](https://www.mediawiki.org/wiki/How_to_become_a_MediaWiki_hacker)



Screenshot of MediaWiki software

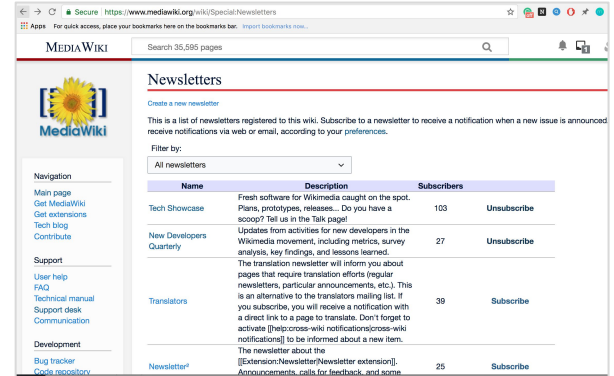
# MediaWiki Extensions

Extending functionality or look of the MediaWiki software

- Circa 180 extensions deployed on Wikimedia websites
- Nearly 2000 extensions listed on mediawiki.org:

[https://www.mediawiki.org/wiki/Category:Extensions  
by\\_category](https://www.mediawiki.org/wiki/Category:Extensions_by_category)

- PHP, JavaScript, LESS/CSS



Screenshot of list of Newsletters available on MediaWiki

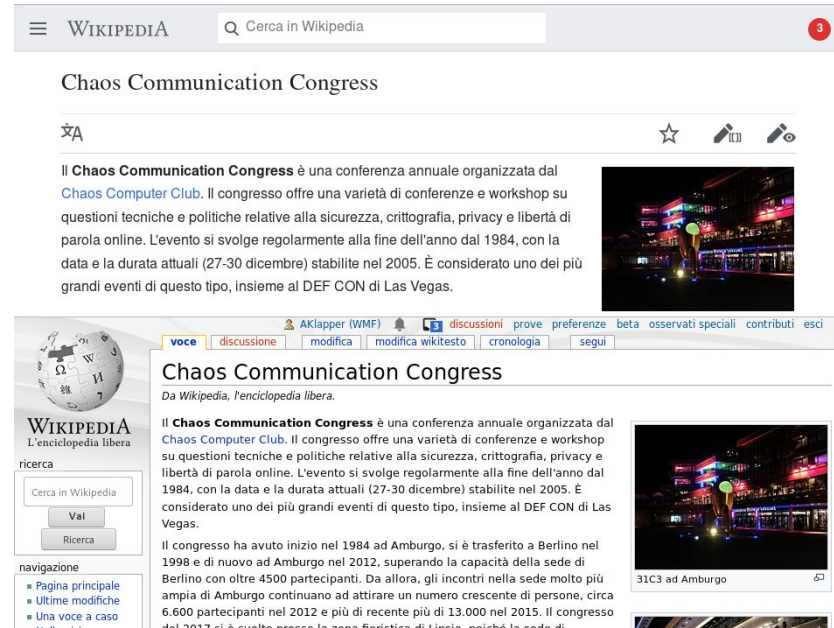
## Example: Newsletter

- <https://www.mediawiki.org/wiki/Extension:Newsletter>
- Allows creating, publishing and subscribing to newsletters on a topic of your interest
- Skills required: PHP, Javascript

# MediaWiki Skins

Customize the look and feel of MediaWiki

- Currently 6 skins available on Wikimedia sites
- <https://www.mediawiki.org/wiki/Manual:Skin>
- S
- Required skills: CSS



The image displays two screenshots of the Italian Wikipedia page for "Chaos Communication Congress".

The top screenshot shows the page using the **Minerva** skin. It features a clean, modern layout with a light grey header containing the Wikipedia logo and a search bar. The main content area is white with a clear separation between the title, a small image, and the introductory text. Navigation and editing tools are visible in the top right corner.

The bottom screenshot shows the same page using the **Monobook** skin. This skin has a more traditional, cluttered appearance with a prominent sidebar on the left containing the Wikipedia logo, search bar, and navigation links. The main content area is narrower and includes a table of actions (voce, discussione, modifica, etc.) above the article title and text.

The Minerva and the Monobook skins on Italian Wikipedia

# Web API and REST API

- [https://www.mediawiki.org/wiki/API:Main\\_page](https://www.mediawiki.org/wiki/API:Main_page)
- Use data from Wikimedia sites for your own needs.



Listen to Wikipedia: <http://listen.hatnote.com/>

# Data Dumps / Offline Applications

## Data dumps

- Download XML and SQL data dumps for offline usage.
- [https://meta.wikimedia.org/wiki/Data\\_dumps](https://meta.wikimedia.org/wiki/Data_dumps)

## Offline applications

- Overview: [https://meta.wikimedia.org/wiki/Offline\\_Projects/Tech\\_Development](https://meta.wikimedia.org/wiki/Offline_Projects/Tech_Development)

## Example: KiwiX

- Take Wikipedia with you and use it without internet connectivity
- Example: KiwiX at <http://www.kiwix.org/>
- Skills required: C++

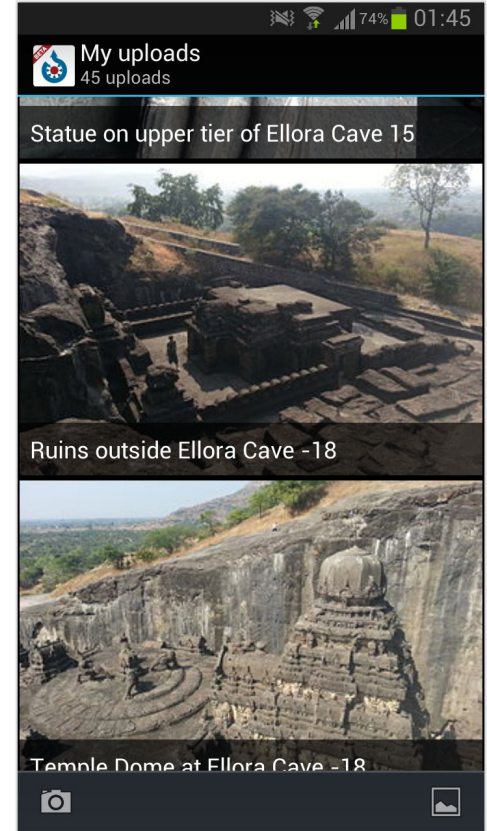
# Mobile Applications

## Wikipedia App

- Skills required: Objective-C/Swift (iOS), Java (Android)
- [https://www.mediawiki.org/wiki/Wikimedia\\_Apps](https://www.mediawiki.org/wiki/Wikimedia_Apps)

## Wikimedia Commons Android App

- Allows uploading pictures to Wikimedia Commons from Android
- Skills required: Java (Android)
- [https://commons.wikimedia.org/wiki/Commons:Mobile\\_app](https://commons.wikimedia.org/wiki/Commons:Mobile_app)



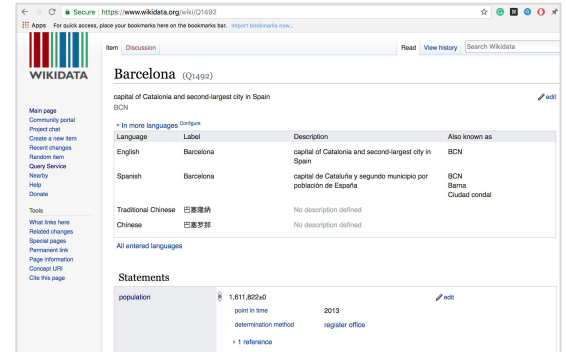
Commons app screenshot  
CC BY-SA 3.0 by Yuvipanda

# Structured Data

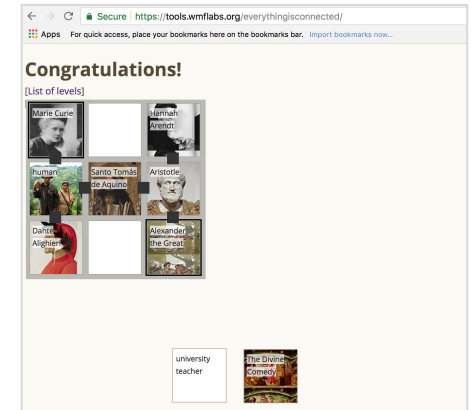
Organization of data in a structured format that makes data easily editable, searchable and re-usable

## Wikidata

- Central repository of structured data for all Wikimedia sites
- Skills required: PHP, Javascript, SPARQL to formulate queries



Screenshot of Wikidata item on Barcelona



Screenshot of Wikidata puzzle game

# Cloud Services

<https://wikitech.wikimedia.org/wiki/Portal:Toolforge>

- Hosting environment (based on Openstack) for developers working on services that provide value to the Wikimedia movement. (Basically: Webspace for your tools which you want to share with others.)
- Allows developers to do ad hoc analytics, administer bots, run web services, generally create tools to help contributors in their work. Also includes access to a variety of data services.
- 1000+ tools hosted: <https://tools.wmflabs.org/admin/tools>
- Cloud VPS: [https://wikitech.wikimedia.org/wiki/Portal:Cloud\\_VPS](https://wikitech.wikimedia.org/wiki/Portal:Cloud_VPS)
- >160 projects: <https://tools.wmflabs.org/openstack-browser/project/>



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Harris



# Bots

- Automated tools that help perform tedious or repetitive tasks related to a wiki (e.g. spell check, revert vandalism). They use the API to automatically process/change and analyze content.
- Example Bot: Pywikibot  
<https://www.mediawiki.org/wiki/Manual:Pywikibot>
- Skills required: Python & related libraries

More info: <https://www.mediawiki.org/wiki/Manual:Bots>

# Machine Learning

## ORES

- Machine learning web service & API, allows scoring and evaluating an edit
- Skills required: Any/some of: HTML, JS, CSS, Python, Redis, Postgres, Python Scikit-learn, MediaWiki, MariaDB

More info: <https://www.mediawiki.org/wiki/ORES>



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# Desktop Applications

For interacting with content (requires knowing how Wikimedia works)

## Huggle

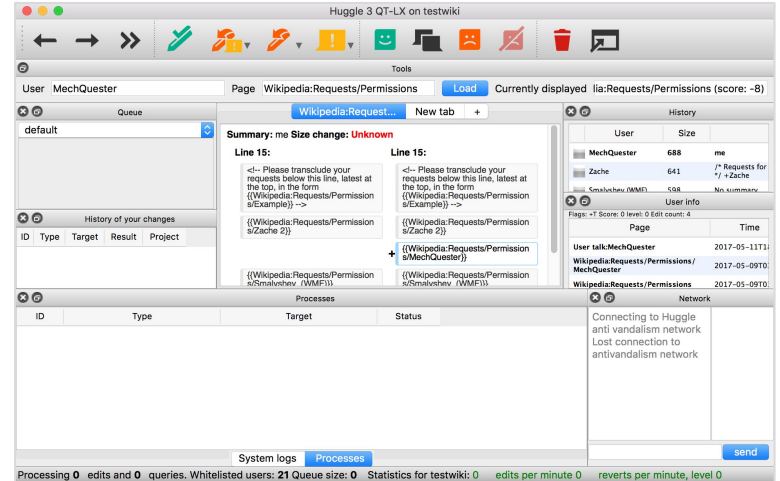
- An anti-vandalism tool that helps revert edits that are problematic
- Skills required: C++ & Qt framework
- <https://meta.wikimedia.org/wiki/Huggle>

## AutoWikiBrowser

- Skills required: C#
- <https://en.wikipedia.org/wiki/Wikipedia:AutoWikiBrowser>

## WPCleaner

- Skills required: Java
- <https://en.wikipedia.org/wiki/Wikipedia:WPCleaner>



Huggle

# Analytics, Testing, SRE, Services, ...

**Analytics:** Get statistics. Create visualizations. Make data informed decisions.

- <https://wikitech.wikimedia.org/wiki/Analytics>

**Testing / Quality Assurance:** QA and Browser test automation

- Skills required: Node.js / JavaScript, Selenium
- [https://www.mediawiki.org/wiki/Quality\\_Assurance](https://www.mediawiki.org/wiki/Quality_Assurance)

**Site reliability (SRE) of Wikimedia servers:** Configuration and maintenance

- Skills required: Python, Puppet, Shell scripts, ...
- For example: [https://wikitech.wikimedia.org/wiki/Puppet\\_coding](https://wikitech.wikimedia.org/wiki/Puppet_coding)

**Services (Core Platform)**

- Examples: Citoid (locate citation data), Mathoid (convert math input to MathML/images)
- Skills required: Node.js / JavaScript

Welcome to the ~~chaos~~  
many opportunities.

# Resources

- Ways how to contribute, also non-technical:  
[https://www.mediawiki.org/wiki/How\\_to\\_contribute](https://www.mediawiki.org/wiki/How_to_contribute)  
(Translation, Design, Documentation, ...)
- Recommend projects (with mentors) for new developers:  
[https://www.mediawiki.org/wiki/New\\_Developers](https://www.mediawiki.org/wiki/New_Developers)
- Good first bugs across any projects, for self-learners:  
[https://www.mediawiki.org/wiki/Good\\_first\\_bugs](https://www.mediawiki.org/wiki/Good_first_bugs)

Explore, create, share, collaborate, have fun!

Thank you!

Did you find something interesting?

Or did we scare you too much?

How can we help?



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Slides based on [https://commons.wikimedia.org/wiki/File:Wikimedia\\_Hackathon\\_2018\\_-\\_Introduction\\_to\\_Wikimedia\\_technical\\_areas\\_and\\_projects.pdf](https://commons.wikimedia.org/wiki/File:Wikimedia_Hackathon_2018_-_Introduction_to_Wikimedia_technical_areas_and_projects.pdf) by Srishti Sethi, CC BY SA 4.0