



Aalto University
Media Factory

Digital_Fabrication_Studio.02

Projects and Information - managing and retrieving information from databases and objects

Massimo Menichinelli

massimo.menichinelli@aalto.fi

@openp2pdesign

<http://www.slideshare.net/openp2pdesign>





Aalto University
Media Factory

Today:

- * Content Management Systems
- * Version Control Systems
- * QR Codes
- * Blueprints

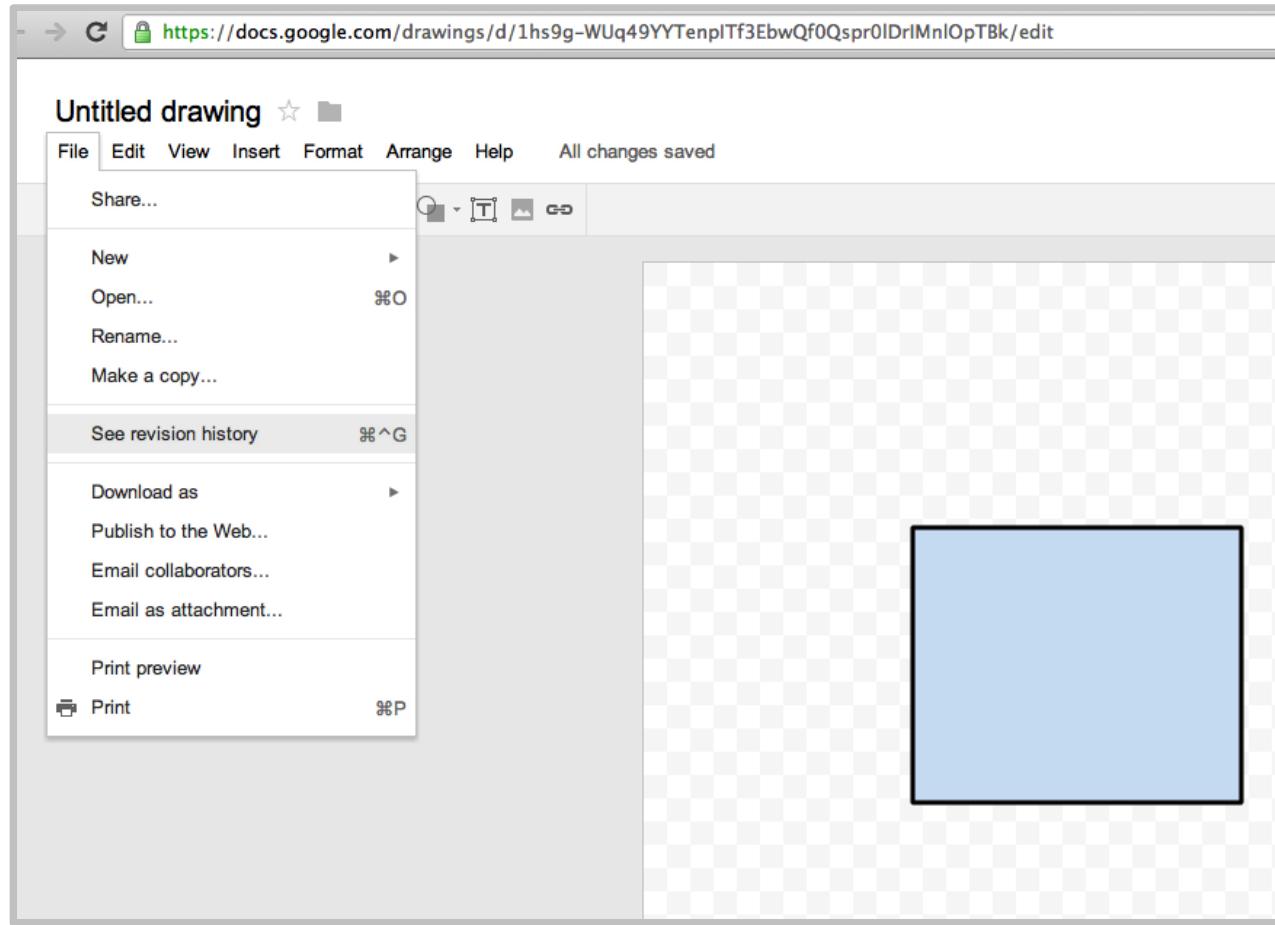


Aalto University
Media Factory

01.

Content Management Systems: web interfaces to databases

Versioning: you've already seen it on Google Docs...



Even Google Docs has a very simple versioning system available. It is an important mechanism for keeping track of the history of a project.

Blog: Wordpress.org

The screenshot shows the WordPress.org website. At the top, there's a navigation bar with links for Home, Showcase, Themes, Plugins, Mobile, About, Docs, Blog, Forums, Hosting, and a prominent red Download button. To the right of the navigation is a search bar with a 'Go' button. Below the navigation is the main content area. On the left, a sidebar displays a site menu with options like Home, Updates (3), Posts, Media, Links, Pages, and Comments (1). The main content area features a large 'Dashboard' section with a house icon. Below it, a 'Right Now' summary shows 2 Posts, 1 Page, 1 Category, and 0 Tags. To the right of this summary is a descriptive text block about WordPress, followed by a 'Ready to get started?' link and a 'Download WordPress 3.3.2' button. At the bottom of the main content area is a yellow banner stating 'WordPress is also available in Suomi and Svenska.'

WORDPRESS.ORG

Home Showcase Themes Plugins Mobile About Docs Blog Forums Hosting Download

Search WordPress.org Go

My Awesome Site

Dashboard

Home

Updates 3

Posts

Media

Links

Pages

Comments 1

Dashboard

Right Now

Content

2 Posts

1 Page

1 Category

0 Tags

WordPress is web software you can use to create a beautiful website or blog. We like to say that WordPress is both free and priceless at the same time.

The core software is built by hundreds of community volunteers, and when you're ready for more there are thousands of [plugins](#) and [themes](#) available to transform your site into almost [anything you can imagine](#). Over 60 million people have chosen WordPress to power the place on the web they call "home" — we'd love you to join the family.

Ready to get started? [Download WordPress 3.3.2](#)

WordPress is also available in [Suomi](#) and [Svenska](#).

The easiest way to manage content (and a bit of versioning).

Source: <http://wordpress.org/>

Blog: Wordpress.org (+ plugin)

Plugin Directory

Username Password [Log in](#) ([forgot?](#)) or [Register](#)

Extend Home

Plugins [Developer Center](#)

Themes

Mobile

Ideas

Kvetch!

Search Plugins [Search](#)

Popular Tags [More »](#)

- widget (3047)
- Post (2019)
- plugin (1897)
- admin (1542)
- posts (1484)

The Revisions Meta box

Revision Control

Revision Control allows finer control over the Post Revision system included with WordPress

[Download Version 2.1](#)

Description Screenshots Other Notes Changelog Stats

Compare	Date Created	Author	Actions
<input checked="" type="radio"/>	9 January, 2010 @ 13:31 [Current Revision]	admin	
<input type="radio"/>	9 January, 2010 @ 13:31	admin	Restore Remove
<input type="radio"/>	9 January, 2010 @ 13:31	admin	Restore Remove
<input type="radio"/>	9 January, 2010 @ 13:31	admin	Restore Remove
<input type="radio"/>	9 January, 2010 @ 13:30	admin	Restore Remove
<input type="radio"/>	9 January, 2010 @ 13:28	admin	Restore Remove
<input type="radio"/>	9 January, 2010 @ 13:28	admin	Restore Remove
<input checked="" type="radio"/>	9 January, 2010 @ 13:11 [Autosave]	admin	Restore Remove

Requires: 3.2 or higher
Last Updated: 2011-8-19
Downloads: 107,773

Average Rating  (95 ratings)

FYI
[Other Versions »](#)
[Subversion Repository »](#)

[Forums Posts](#)

Revision Control allows finer control over the Post Revision system included with WordPress.

Source: <http://wordpress.org/extend/plugins/revision-control/>

Blog: Wordpress.org (+ plugin)

Plugin Directory

Username Password Log in (forgot?) or Register

Extend Home

Plugins

- Developer Center

Themes

Mobile

Ideas

Kvetch!

Search Plugins

Popular Tags More »

- widget (3047)
- Post (2019)
- plugin (1897)
- admin (1542)
- posts (1484)
- sidebar (1348)
- comments (1056)
- twitter (1024)
- google (1016)
- images (997)
- page (951)
- image (870)
- links (815)

WP Document Revisions

A document management and version control plugin that allows teams of any size to collaboratively edit files and manage their workflow.

[Download Version 1.3](#)

Description Installation FAQ Screenshots Other Notes Changelog Stats

WP Document Revisions is a [document management](#) and [version control](#) plugin. Built for time-sensitive and mission-critical projects, teams can collaboratively edit files of any format — text documents, spreadsheets, images, sheet music... anything — all the while, seamlessly tracking the document's progress as it moves through your organization's existing workflow.

Requires: 3.2 or higher
Compatible up to: 3.4
Last Updated: 2012-4-28
Downloads: 12,309

Average Rating

★★★★★ (22 ratings)

FYI

[Other Versions »](#)
[Subversion Repository »](#)
[Donate to this plugin »](#)

A document management and version control plugin that allows teams of any size to collaboratively edit files and manage their workflow.

Source: <http://wordpress.org/extend/plugins/wp-document-revisions/>

CMS: Drupal.org

Get Started Community Documentation Support Download & Extend Marketplace About

Drupal™

Come for the software, stay for the community

Drupal is an open source content management platform powering millions of websites and applications. It's built, used, and supported by an active and diverse community of people around the world.

Drupal Homepage Log in / Register

Search drupal.org

Refine your search

All Documentation
 Modules Forums & Issues
 Themes Groups

Why Choose Drupal?

Use Drupal to build everything from personal blogs to enterprise applications. Thousands of add-on modules and designs let you build any site you can imagine. Join us!

Get Started with Drupal

Sites Made with Drupal



Symantec Connect Case Study

Drupal is used by some of the biggest sites on the Web, like [The Economist](#), [Examiner.com](#) and [The White House](#). Read more Drupal [case studies](#).

Develop with Drupal

15,814 Modules 1,369 Themes 407 Distributions 17,543 Developers This week 3,743 [Code commits](#) 6,441 [Issue comments](#)

Drupal Core Security Info Developer Docs API Docs

Get Drupal Security Announcements
Keep your site secure.

Drupal contains basic features common to a cms: user account registration and maintenance, menu management, RSS-feeds, page layout customization...

Source: <http://wordpress.org/extend/plugins/wp-document-revisions/>

CMS: Drupal.org (+modules)

You can extend the versioning system of Drupal with these modules:

- * <http://drupal.org/project/revisioning>
 - * http://drupal.org/project/revision_fu
 - * <http://drupal.org/project/revisionreference>
 - * http://drupal.org/project/block_revisions
 - * http://drupal.org/project/diff_revision
 - * http://drupal.org/project/revision_all
 - * http://drupal.org/project/user_revision
 - * http://drupal.org/project/user_diff
-

CMS: Drupal.org -> fablab.aalto.fi

Home FAQ Equipment Activities People Contact

AALTO FABLAB

Find us on Twitter or Facebook,
see our pictures on Flickr, visit us at Arabia or
mail us: fablab@aalto.fi

FabLab (fabrication laboratory) is a small-scale workshop for digital fabrication, started by MIT. In a Fablab you can find machines such as the lasercutter, vinyl cutter, desktop CNC milling machine and 3D printer and electronics prototyping equipment.

FabLabs aim to make this equipment available to everyone, not just students of art, design and engineering - we will host Open Days every week. Just bring your design idea along!



NOW AT AALTO FABLAB
Tuesday 7.5. - NO OPEN DAY
Tuesday 14.5. Open Day 12-18

NO OPEN DAY
Flickr Feed

Our website is based on Drupal...

Wiki: Mediawiki.org

MediaWiki logo: A yellow sunflower with a blue center and green leaves, enclosed in a blue square frame.

Main page | Page Discussion | Read View source View history | Search | Select font Log in / create account

Our updated Terms of Use will become effective on May 25, 2012. [Find out more.](#)

Welcome to MediaWiki.org

MediaWiki is a free software open source wiki package written in PHP, originally for use on Wikipedia. It is now used by several other projects of the non-profit Wikimedia Foundation and by many other wikis, including this website, the home of MediaWiki.

Use the links below to explore the site contents. You'll find some content translated into other languages, but the primary documentation language is English.

For general questions about MediaWiki see the [communication page](#) or ask at the [support desk](#).

About this site | About MediaWiki | Download | Help and support

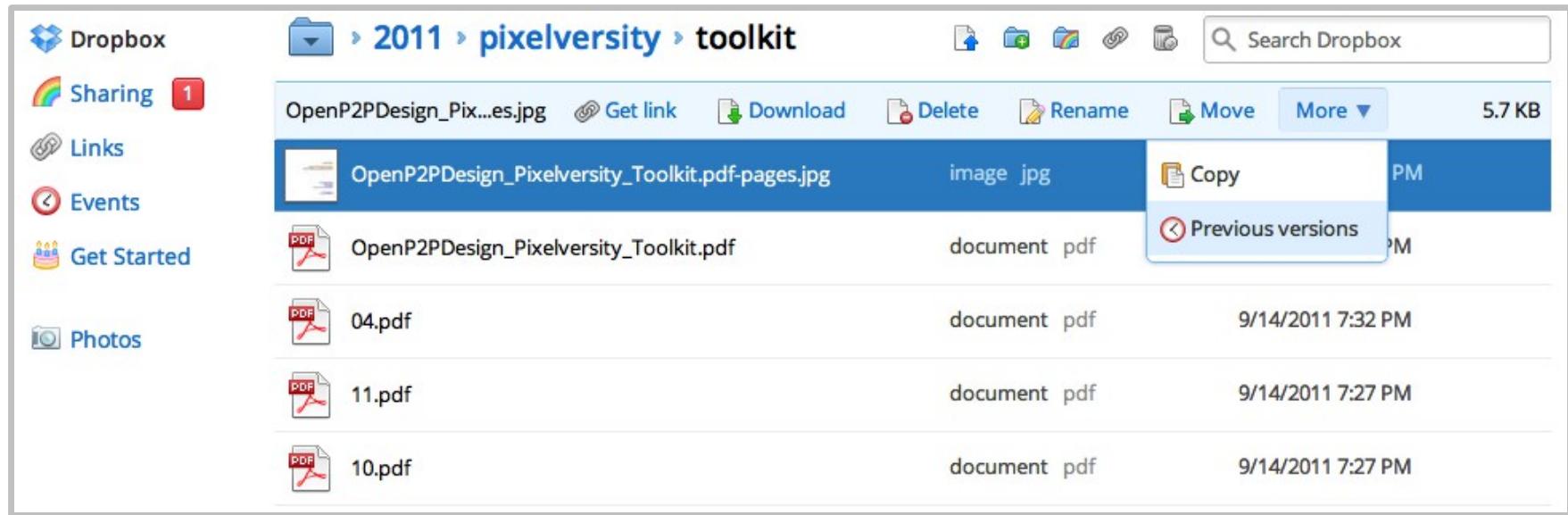
Users  What is a wiki? <ul style="list-style-type: none">Learn how to navigateLearn how to edit a pageGet more help	System administrators  Install & configure MediaWiki <ul style="list-style-type: none">Upgrade an existing MediaWiki installationAdd features with third-party extensionsGet more sysadmin help	Developers  Become a MediaWiki hacker <ul style="list-style-type: none">Learn to use the API and write extensionsBrowse the developer docs and class referenceAlready a hacker? Visit the developer hub
--	--	--

Main page | Page Discussion | Read View source View history | Search | Select font Log in / create account

MediaWiki is a free software open source wiki package written in PHP, originally for use on Wikipedia.

Source: <http://www.mediawiki.org/wiki/MediaWiki>

Backup: DropBox



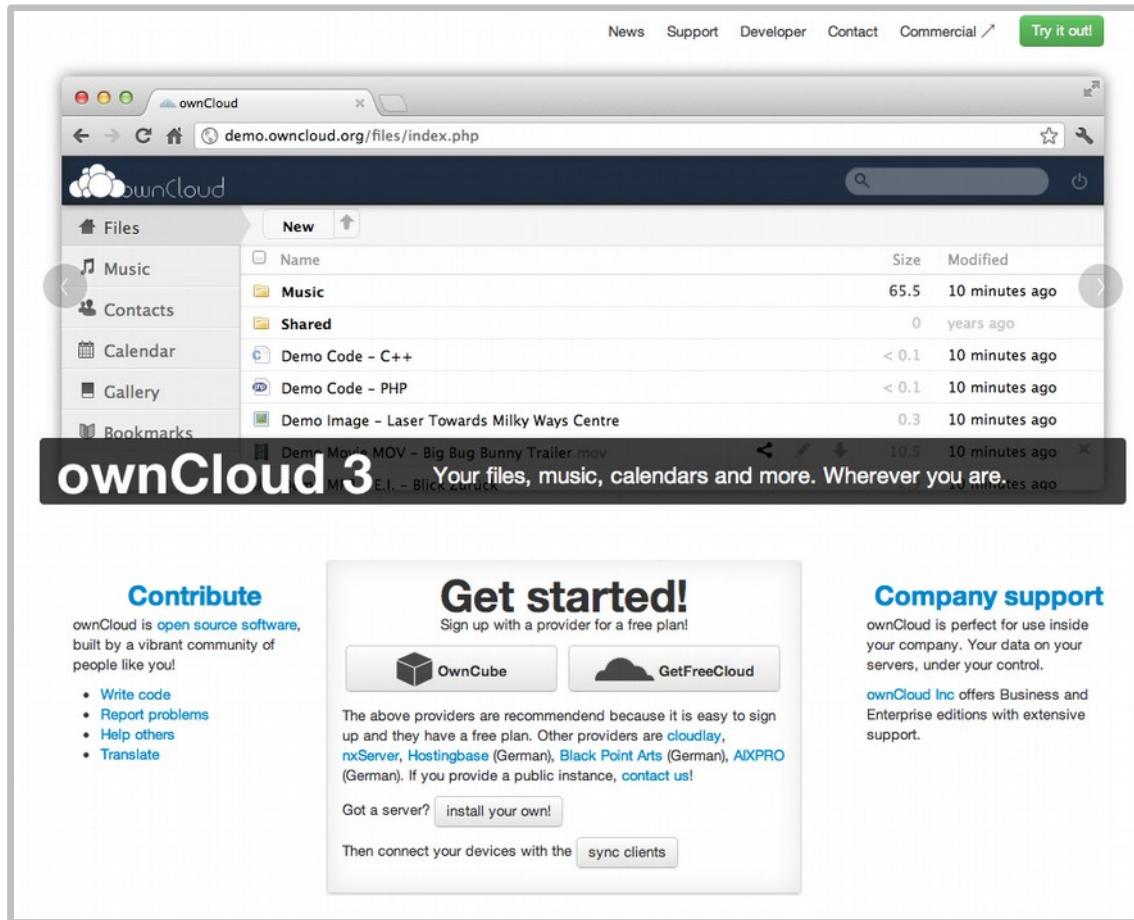
The screenshot shows a Dropbox interface with a sidebar on the left containing links for Sharing, Links, Events, Get Started, and Photos. The main area displays a folder structure: 2011 > pixelversity > toolkit. Inside the toolkit folder, there are several files listed:

File Name	Type	Size
OpenP2PDesign_Pix...es.jpg	image jpg	5.7 KB
OpenP2PDesign_Pixelversity_Toolkit.pdf-pages.jpg	image jpg	(highlighted)
OpenP2PDesign_Pixelversity_Toolkit.pdf	document pdf	
04.pdf	document pdf	9/14/2011 7:32 PM
11.pdf	document pdf	9/14/2011 7:27 PM
10.pdf	document pdf	9/14/2011 7:27 PM

A context menu is open over the highlighted file "OpenP2PDesign_Pixelversity_Toolkit.pdf-pages.jpg", showing options like Copy and Previous versions.

DropBox has a limited versioning system, that goes back to 30 days only.

Backup: ownCloud



An open source version of DropBox, in case you have a server available.

Source: <http://owncloud.org/>

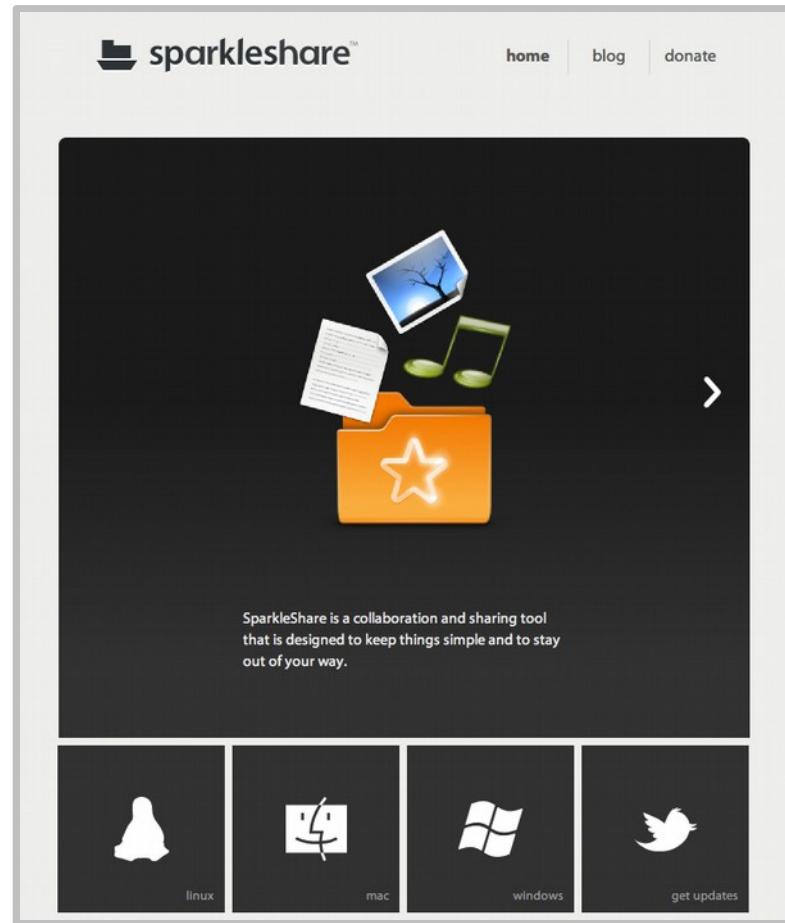
Backup: ownCloud (with versioning)

The screenshot shows a GitHub repository page for 'craig0990 / ownCloud'. The repository is described as a 'Personal clone of ownCloud, containing an in-development versioning app (I would seriously advise against cloning and pulling from this repository at the moment) — [Read more](#)'. Below this, there's a link to <http://owncloud.org>. The page includes standard GitHub navigation tabs: Code, Network, Pull Requests, Issues, Wiki, and Graphs. Under the 'Code' tab, there are download options (Clone in Mac, ZIP, HTTP), a 'Git Read-Only' link, and a 'Read-Only access' button. The main content area shows the 'files_versioning' branch. A commit message from 'craig0990' is visible, dated 3 days ago, fixing a minor new folder bug. Below this, a table displays the version history for the 'ownCloud' directory, listing files like '.tx', '3rdparty', 'apps', 'config', 'core', and 'files' with their respective ages and commit messages.

name	age	message	history
.tx	7 months ago	integrated and updated calendar translations [Jan-Christoph Borchardt]	
3rdparty	a month ago	Added Granite library v0.2.0 to '3rdparty/' [craig0990]	
apps	3 days ago	Fixed minor new folder bug [craig0990]	
config	a month ago	make it possible to connect to other ocs appstores and other ocs know... [Frank Karlitschek]	
core	a month ago	Merge commit 'refs/merge-requests/102' of git://gitorious.org/ownclou... [CBiX]	
files	a month ago	webdav needs to load authentication apps [Arthur Schiwon]	

“Personal clone of ownCloud, containing an in-development versioning app (I would seriously advise against cloning and pulling from this repository at the moment)”

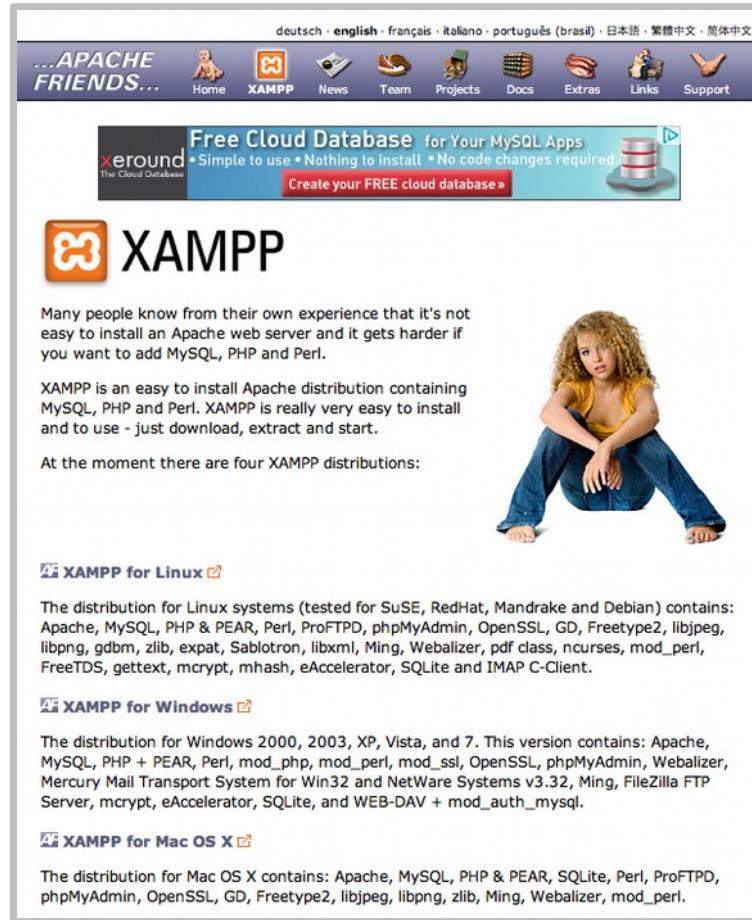
Backup: Sparkleshare



An open source version of DropBox, in case you have a server available (based on Git!).

Source: <http://sparkleshare.org/>

Need a local server? XAMPP



The screenshot shows the Apache Friends XAMPP website. At the top, there's a navigation bar with links for Home, XAMPP (highlighted), News, Team, Projects, Docs, Extras, Links, and Support. Below the navigation, there's a banner for "xeround The Cloud Database" with text about it being free, simple to use, and requiring no installation or code changes. A "Create your FREE cloud database" button is also present. The main content area features a large orange XAMPP logo icon followed by the word "XAMPP". Below the logo, there's a paragraph about the difficulty of installing an Apache web server and adding MySQL, PHP, and Perl. It then describes XAMPP as an easy-to-install distribution containing these components. A woman sitting cross-legged on the floor is shown on the right side of the page. Below the main text, there are three sections with links to "XAMPP for Linux", "XAMPP for Windows", and "XAMPP for Mac OS X", each providing a brief description of the distribution's contents.

Many people know from their own experience that it's not easy to install an Apache web server and it gets harder if you want to add MySQL, PHP and Perl.

XAMPP is an easy to install Apache distribution containing MySQL, PHP and Perl. XAMPP is really very easy to install and to use - just download, extract and start.

At the moment there are four XAMPP distributions:

[XAMPP for Linux](#)

The distribution for Linux systems (tested for SuSE, RedHat, Mandrake and Debian) contains: Apache, MySQL, PHP & PEAR, Perl, ProFTPD, phpMyAdmin, OpenSSL, GD, Freetype2, libjpeg, libpng, gdbname, zlib, expat, Sablotron, libxml, Ming, Webalizer, pdf class, ncurses, mod_perl, FreeTDS, gettext, mcrypt, mhash, eAccelerator, SQLite and IMAP C-Client.

[XAMPP for Windows](#)

The distribution for Windows 2000, 2003, XP, Vista, and 7. This version contains: Apache, MySQL, PHP + PEAR, Perl, mod_php, mod_perl, mod_ssl, OpenSSL, phpMyAdmin, Webalizer, Mercury Mail Transport System for Win32 and NetWare Systems v3.32, Ming, FileZilla FTP Server, mcrypt, eAccelerator, SQLite, and WEB-DAV + mod_auth_mysql.

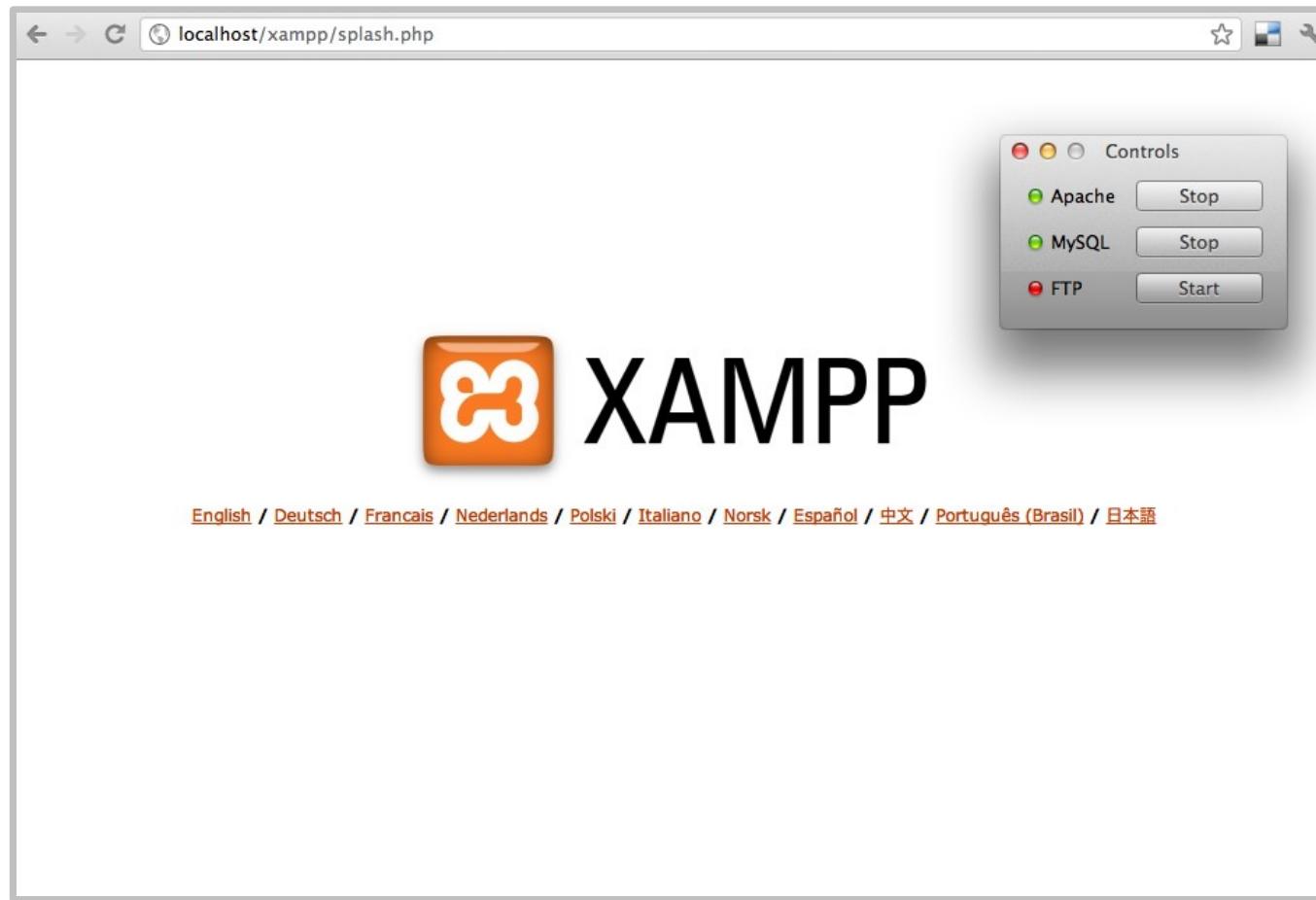
[XAMPP for Mac OS X](#)

The distribution for Mac OS X contains: Apache, MySQL, PHP & PEAR, SQLite, Perl, ProFTPD, phpMyAdmin, OpenSSL, GD, Freetype2, libjpeg, libpng, zlib, Ming, Webalizer, mod_perl.

If you want to use Wordpress, Drupal, MediaWiki locally
on your computer.

Source: <http://www.apachefriends.org/en/xampp.html>

Your local server, `http://localhost/`



Look for the `htdocs` folder in your XAMPP application, all the files accessible through `http://localhost` should be there.

Source: <http://localhost/>

Your local database, <http://localhost/phpmyadmin>

The screenshot shows the phpMyAdmin interface for MySQL localhost. The top navigation bar includes links for Databases, SQL, Status, Variables, Charsets, Engines, Privileges, Processes, Export, and Import. The left sidebar lists databases: cdcoll (1), django, drupal (171), information_schema (28), mysql (23), openp2pdesign (153), test, and wp (20). A message says 'Please select a database'. The main area has sections for Actions (Create new database, MySQL connection collation), Interface (Language: English, Theme / Style: Original, Custom color, Font size), MySQL (Server: Localhost via UNIX socket, Server version: 5.1.44, User: root@localhost, MySQL charset: UTF-8 Unicode (utf8)), Web server (Apache/2.2.14 (Unix) DAV/2 mod_ssl/2.2.14 OpenSSL/0.9.8l PHP/5.3.1, MySQL client version: 5.1.44, PHP extension: mysql), and phpMyAdmin (Version information: 3.2.4, Documentation, Wiki, Official Homepage, [ChangeLog] [Subversion] [Lists]). A note at the bottom left says 'The additional features for working with linked tables have been deactivated. To find out why click [here](#)'. A warning message at the bottom right says 'Your configuration file contains settings (root with no password) that correspond to the default MySQL privileged account. Your MySQL server is running with this default, is open to intrusion, and you really should fix this security hole by setting a password for user ".root".' A link 'Open new phpMyAdmin window' is also present.

You can easily create a database with PhpMyAdmin (but you will probably have to change the password for installing MediaWiki).



Aalto University
Media Factory

02.

Version Control Systems: managing the history of a project

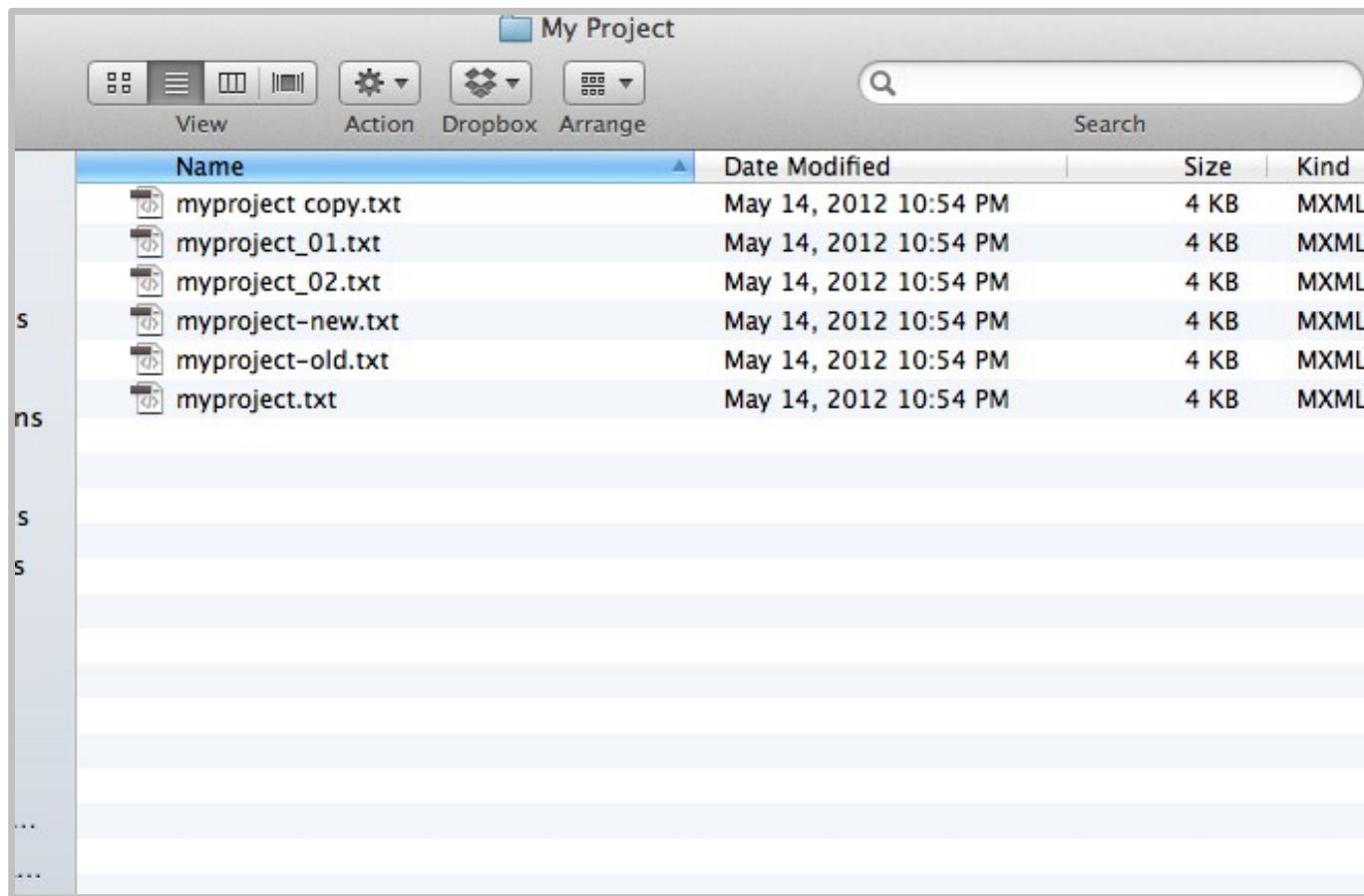


Aalto University
Media Factory

02.01

Version Control Systems: Subversion (SVN)

Control? Organization?



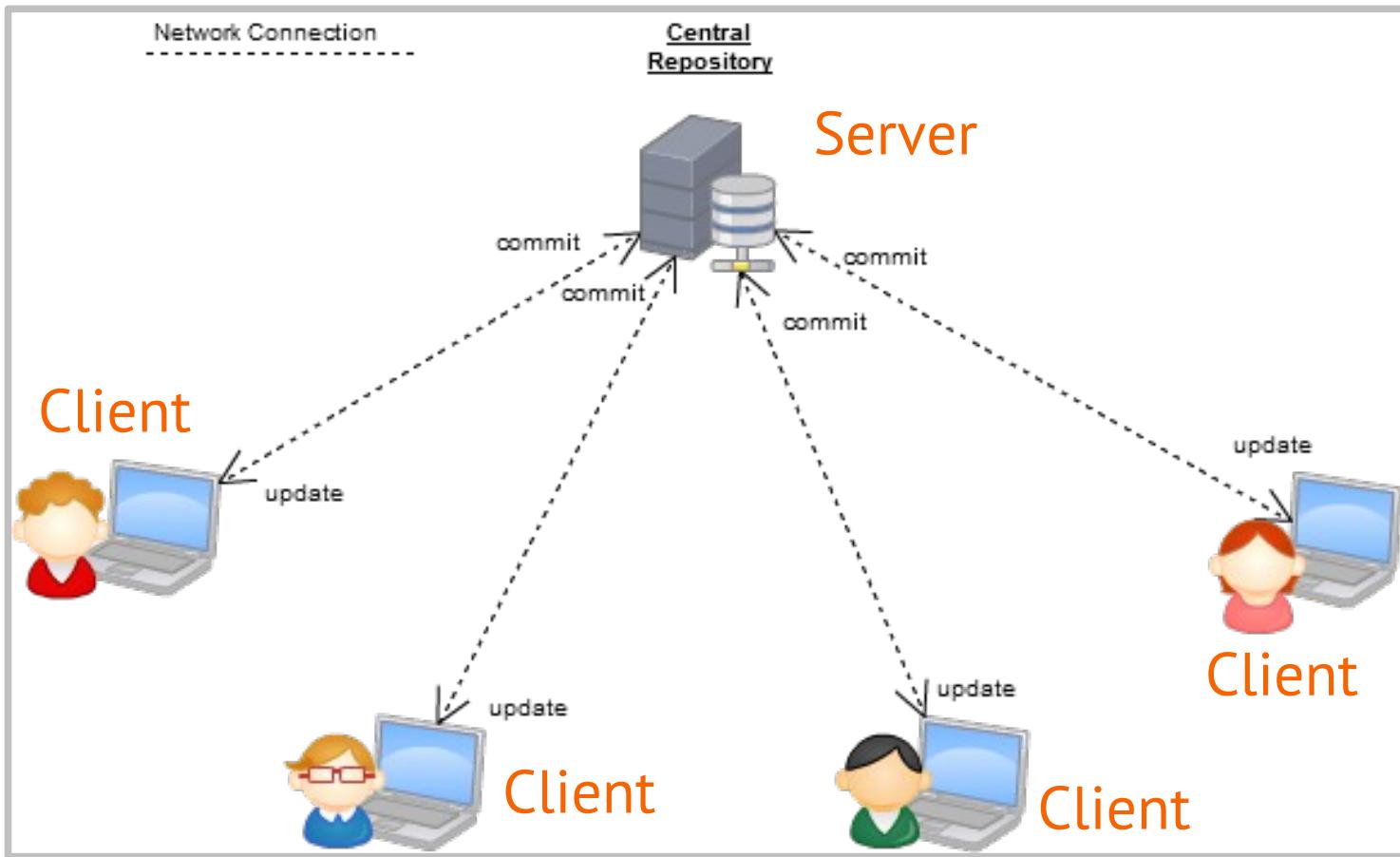
Something very common, that I don't want to see in this course!!

Version Control Systems

A version (or revision) control system is a system that **tracks incremental versions (or revisions)** of files and directories over time. It allows you to explore the changes which resulted in each of those versions and facilitates the arbitrary recall of the same.

- * Backup and Restore
 - * Synchronization
 - * Short-term undo + Long-term undo
 - * Track Changes
 - * Track Ownership
 - * Branching and merging
 - * not in real time!
-

Server/client-based Version Control System



The first architecture to appear, you need to be connected and you need a server (unless you want to work alone on your computer).

Version Control System: Subversion (SVN)



SUBVERSION®

<http://www.apache.org/> 

About Subversion
[News](#)
[Features](#)
[Documentation](#)
[FAQ](#)
[Roadmap](#)
[Security](#)

Getting Subversion
[Source Download](#)
[Binary Packages](#)
[Release Notes](#)

Community
[Mailing Lists](#)
[Reporting Issues](#)
[Wiki](#)
[Getting Involved](#)

About the ASF
[Licenses ↗](#)
[Donate ↗](#)
[Thanks ↗](#)

Search...

Apache™ Subversion®

"Enterprise-class centralized version control for the masses"

Welcome to **subversion.apache.org**, the online home of the Apache Subversion™ software project. Subversion is an open source version control system. Founded in 2000 by CollabNet, Inc., the Subversion project and software have seen incredible success over the past decade. Subversion has enjoyed and continues to enjoy widespread adoption in both the open source arena and the corporate world.

Subversion is developed as a project of the [Apache Software Foundation](#), and as such is part of a rich community of developers and users. We're always in need of individuals with a wide range of skills, and we invite you to participate in the development of Apache Subversion. Here's [how to get started](#).

For helpful hints about how to get the most out of your visit to this site, see the [About This Site](#) section below.

Our Vision

Subversion exists to be universally recognized and adopted as an open-source, centralized version control system characterized by its reliability as a safe haven for valuable data; the simplicity of its model and usage; and its ability to support the needs of a wide variety of users and projects, from individuals to large-scale enterprise operations.

Subversion manages files and directories, and the changes made to them, over time. Think of it as a sort of “time machine” of changes.

An introduction to SVN

The Standard in Open Source Version Control

Version Control with

Subversion

Introduction

This is the home of [Version Control with Subversion](#), a [free](#) book about the ubiquitous [Apache™ Subversion®](#) version control system and written by some of the developers of Subversion itself.

As you may have guessed from the layout of this page, we are quite pleased that some versions of this book have been [published](#) by O'Reilly Media. You can certainly [buy](#) a traditionally published print copy of the book if you'd like to, but you'll always find the most recent versions here on this site, available in both HTML and PDF formats.

Online Versions of the Book

Versions of this book use a numbering system designed to match those used by the Subversion software itself—version 1.7 of [Version Control with Subversion](#) covers Subversion 1.7, for example. Here are the latest versions of the book which are available online:

For Subversion 1.7

- View the [multiple-page HTML edition](#) of the book. [[tar.bz](#)]
- View the [single-page HTML edition](#) of the book. [[tar.bz](#)]
- View the [PDF edition](#) of the book.
- View the book's [DocBook XML sources](#).

An open source book about using SVN.

Version Control System: the vocabulary (01)

- * **Change**: A change (or diff) represents a specific modification to a document under version control.
- * **Checkout** : A check-out (or co) is the act of creating a local working copy from the repository. A user may specify a specific revision or obtain the latest. Also refers to the same files.
- * **Commit** : A commit (checkin, ci) is the action of writing or merging the changes made in the working copy back to the repository. Also refers to the same files.
- * **Head** : The most recent commit.

Version Control System: the vocabulary (02)

* **Conflict**

A conflict occurs when different parties make changes to the same document. A user must resolve the conflict by combining the changes, or by selecting one change.

* **Merge**

A merge or integration is an operation in which two sets of changes are applied to a file or set of files.

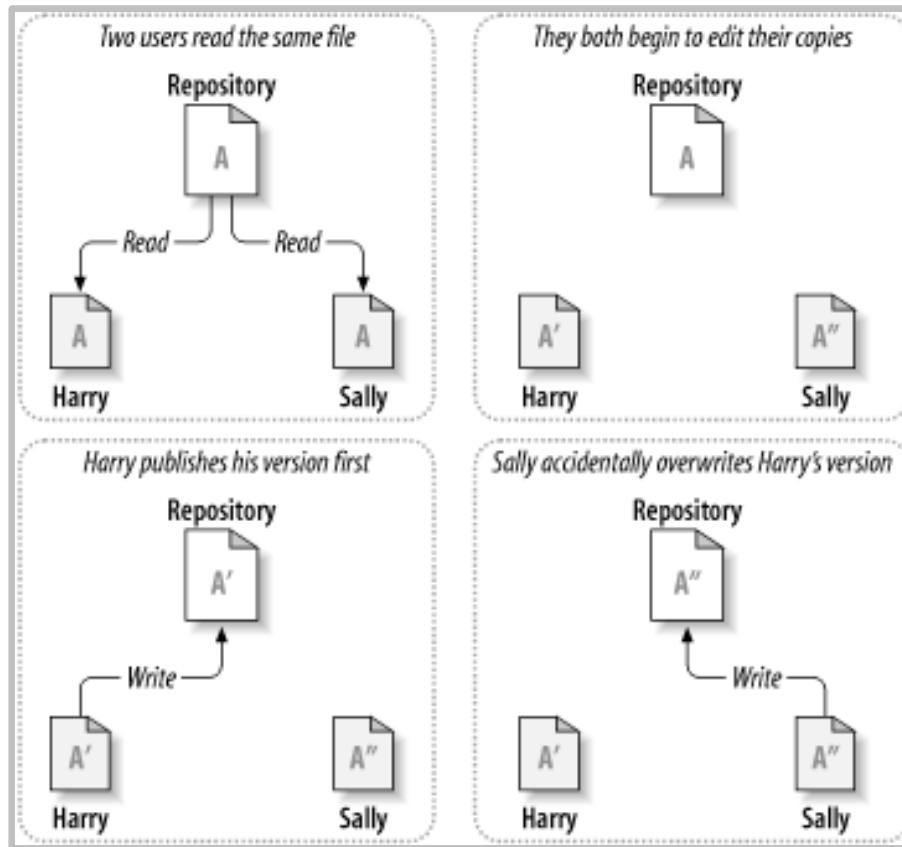
* **Update**

An update (or sync) merges changes made in the repository (by other people, for example) into the local working copy.

* **Working copy**

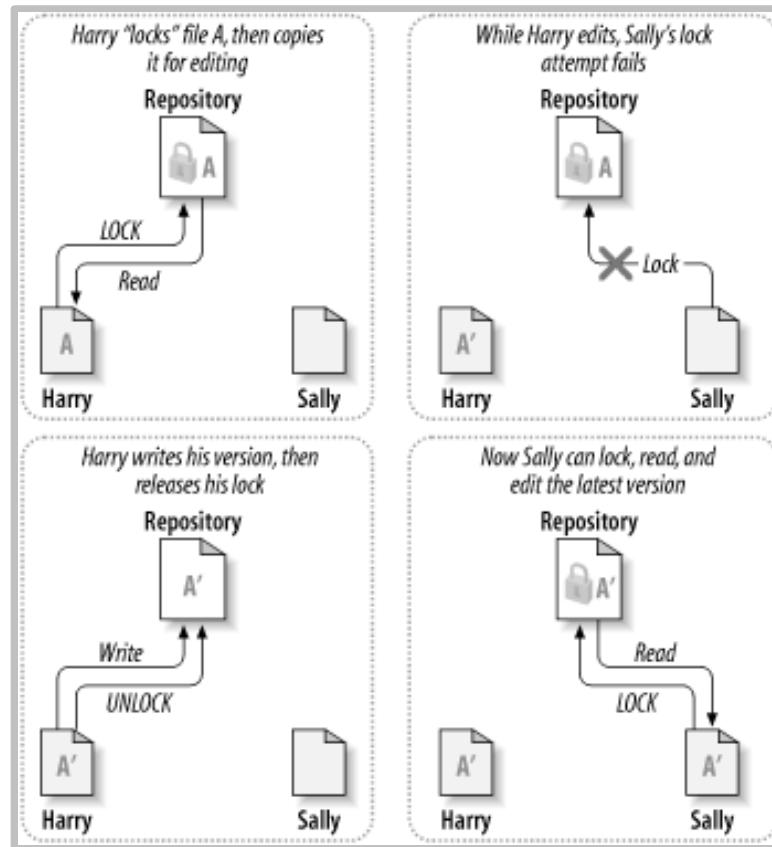
The working copy is the local copy of files from a repository, at a specific time or revision. Conceptually, it is a *sandbox*.

Versioning: the problem



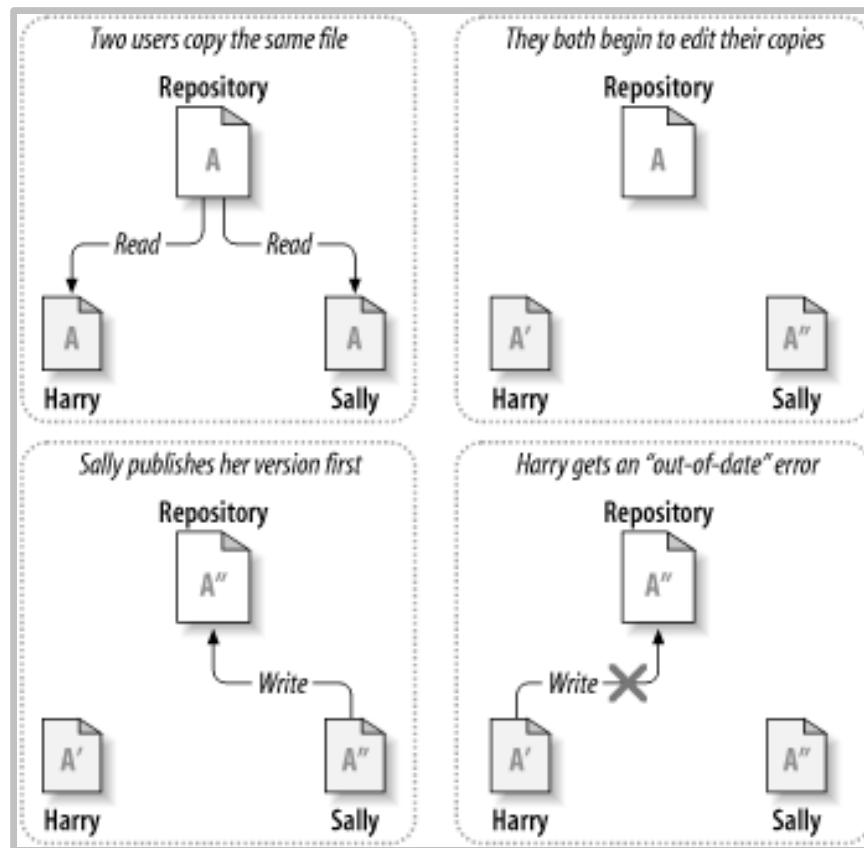
How will the system allow users to share information, but prevent them from accidentally overwriting?

Versioning: the lock-modify-unlock solution



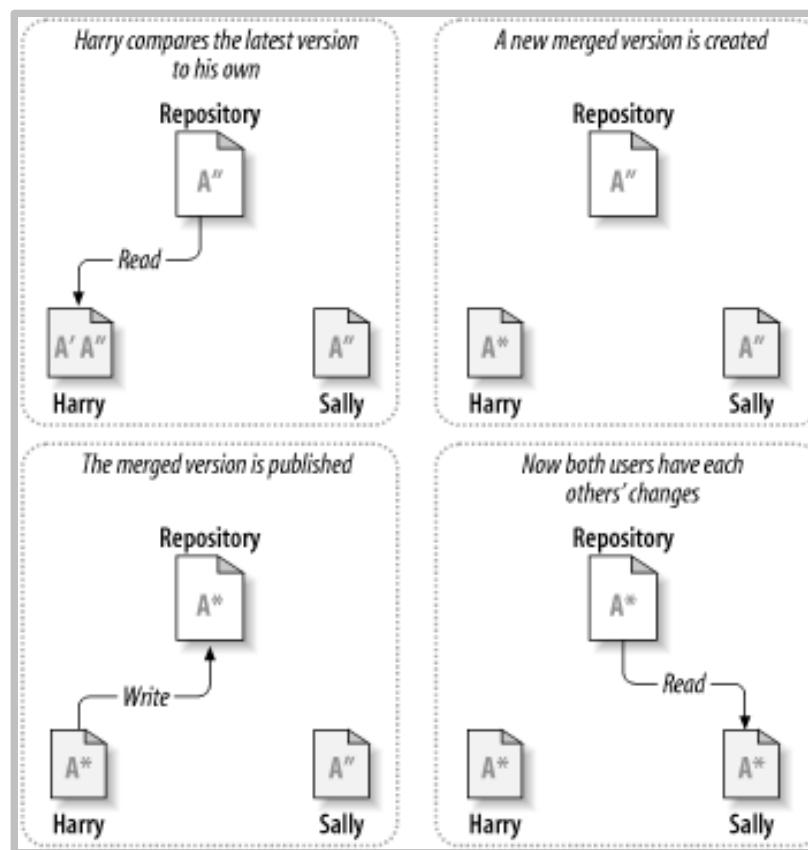
In this model, the repository allows only one person to change a file at a time, by locking it.

Versioning: the copy-modify-merge solution (01)



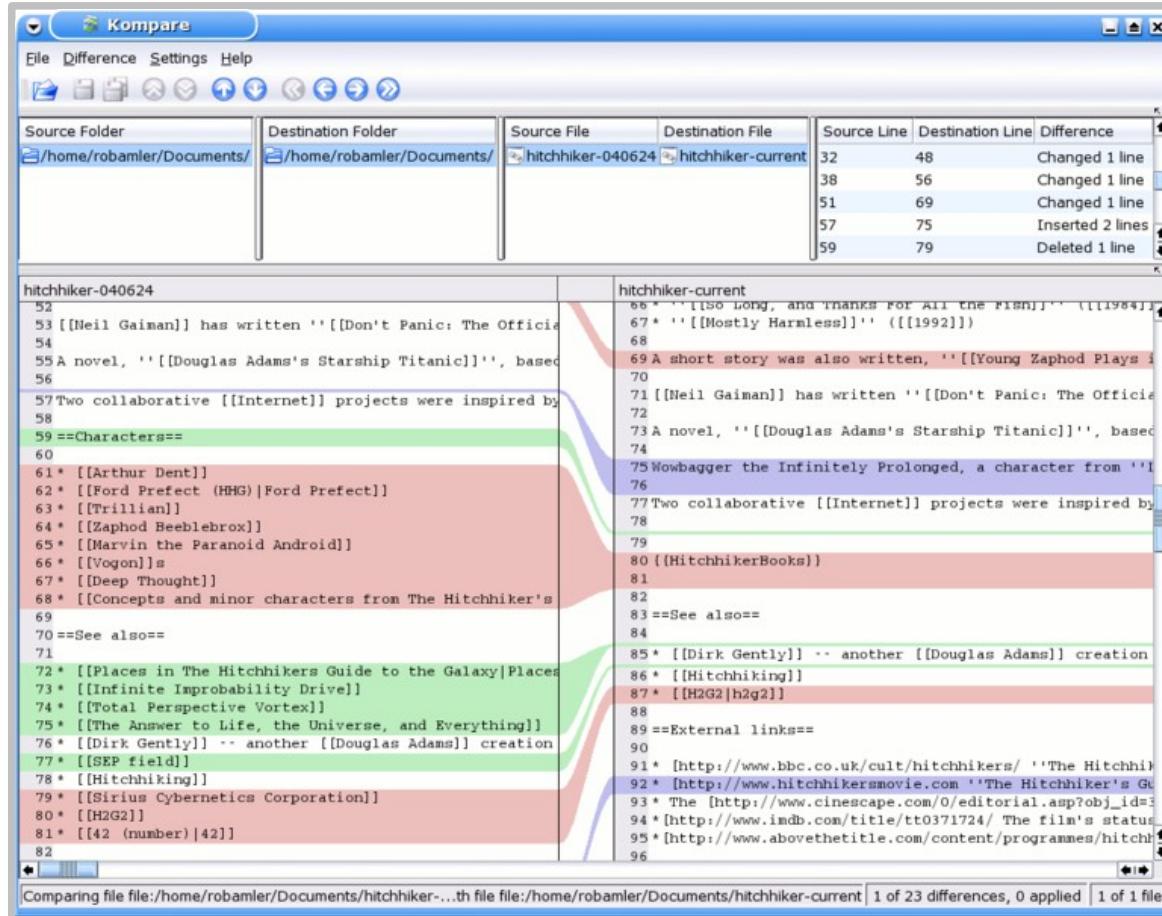
In this model, each user's client contacts the project repository and creates a personal working copy. The private copies are merged together into a new version.

Versioning: the copy-modify-merge solution (02)



In this model, each user's client contacts the project repository and creates a personal working copy. The private copies are merged together into a new version.

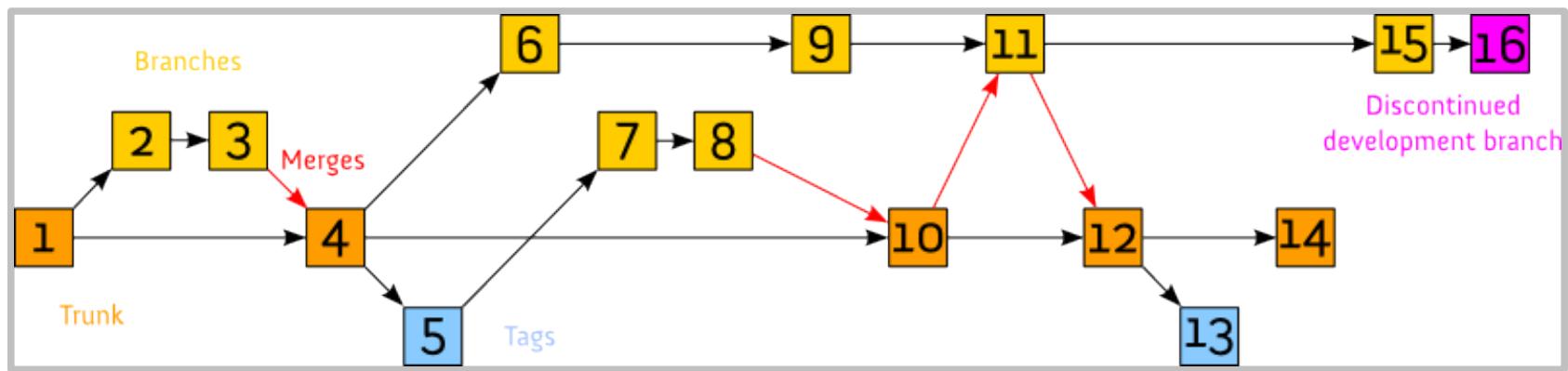
Diff: how to understand the changes



The best way of understanding what has changed is to compare different revisions with a diff software.

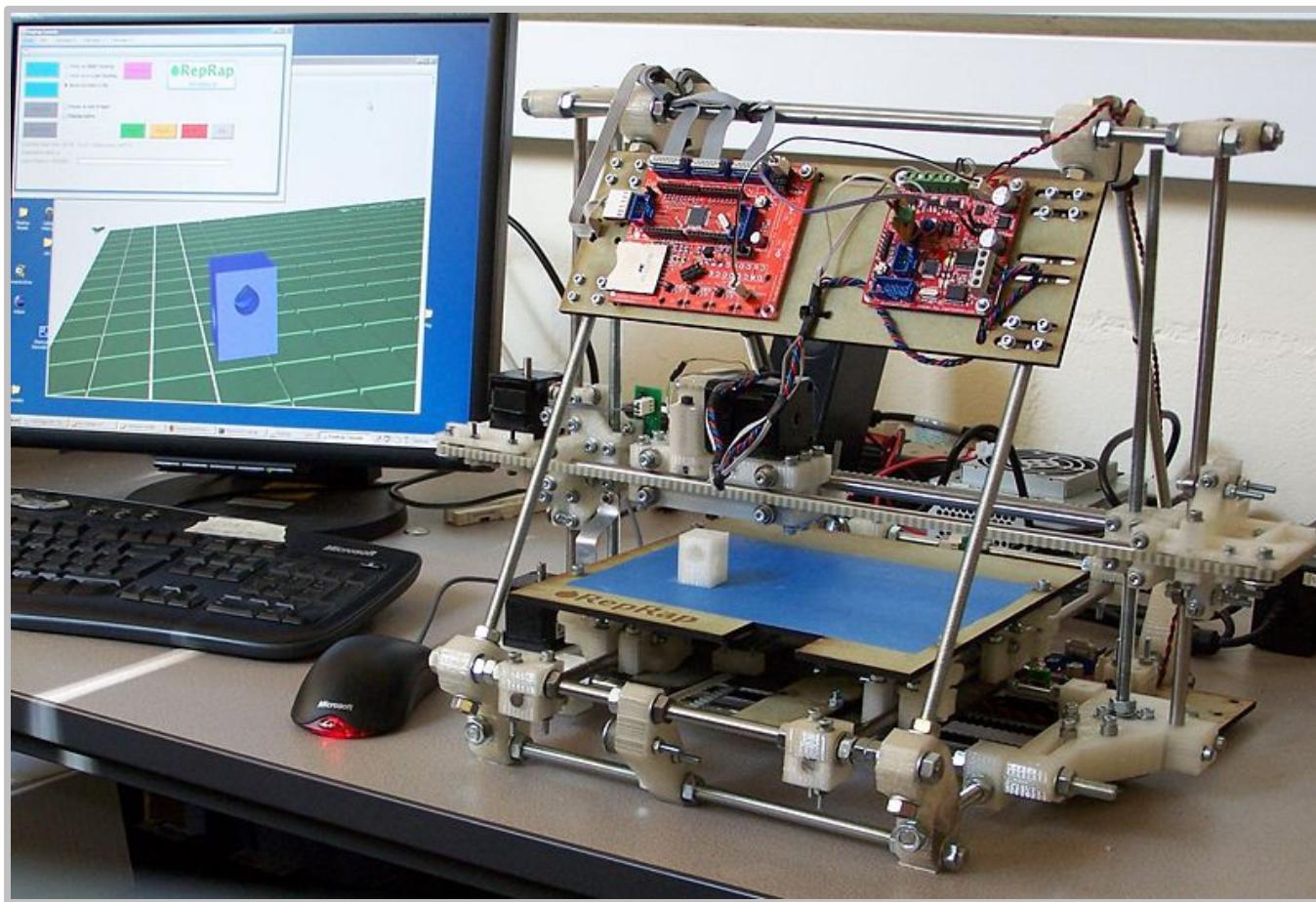
Source: <http://en.wikipedia.org/wiki/Diff>
<http://en.wikipedia.org/wiki/Kompare>

A typical SVN project



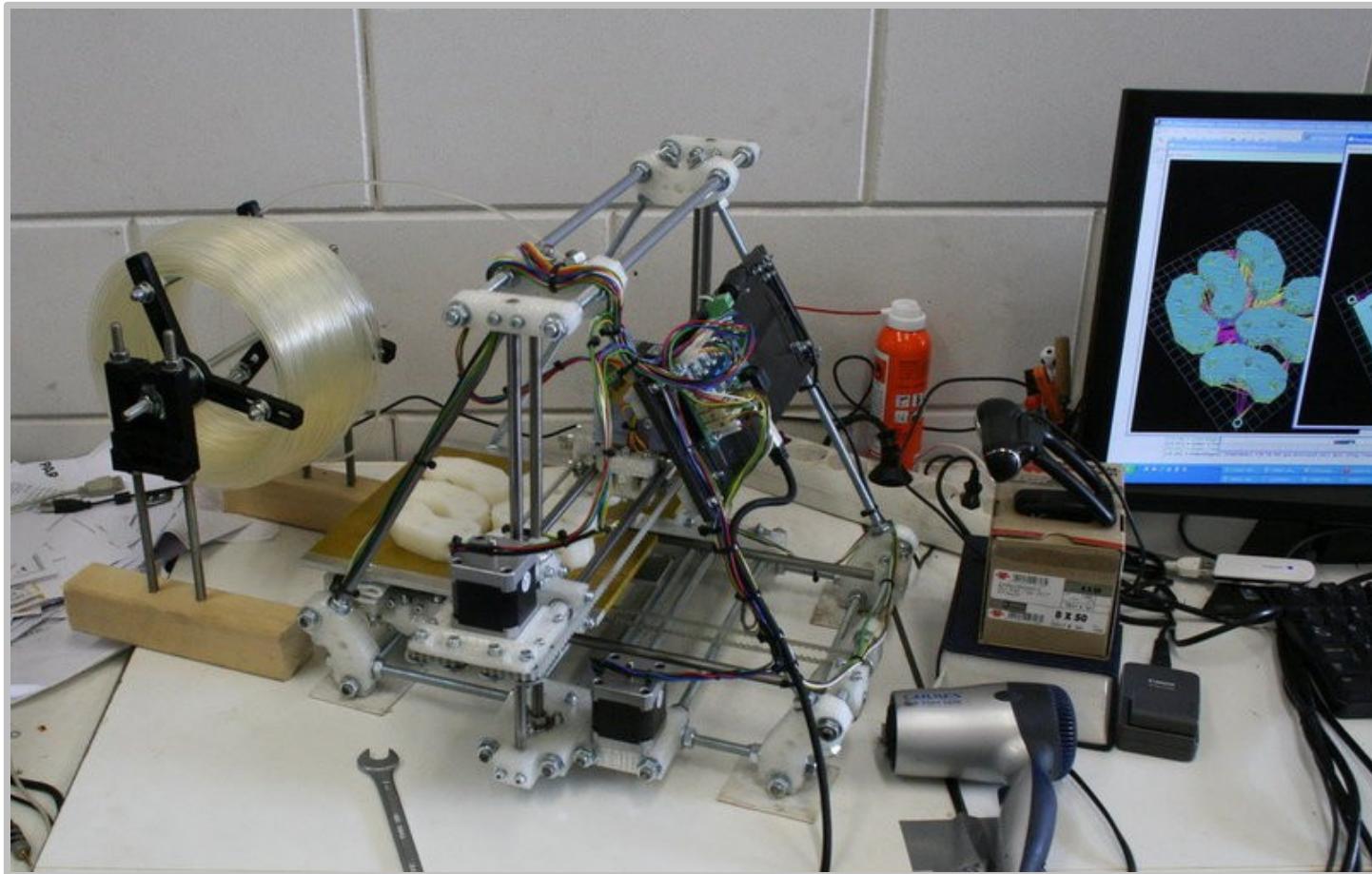
Development happens in *trunk*, testing alternatives in *branches* and storing good versions (1.0, 1.1,...) in *tags*.

Example: a spool for the RepRap Mendel



The second version of the RepRap, the first to be easier to build and calibrate.

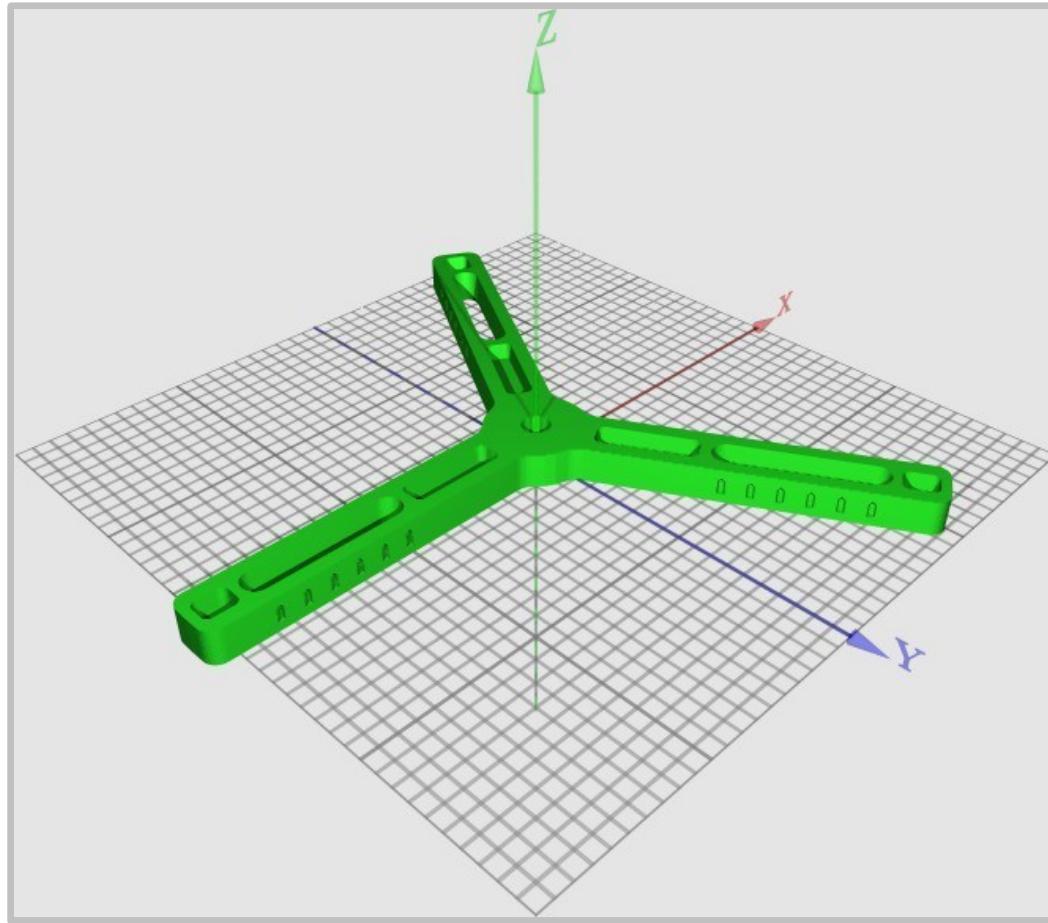
A spool for the RepRap Mendel: an improvement



A spool added for handling the plastic wire and published on Thingiverse.

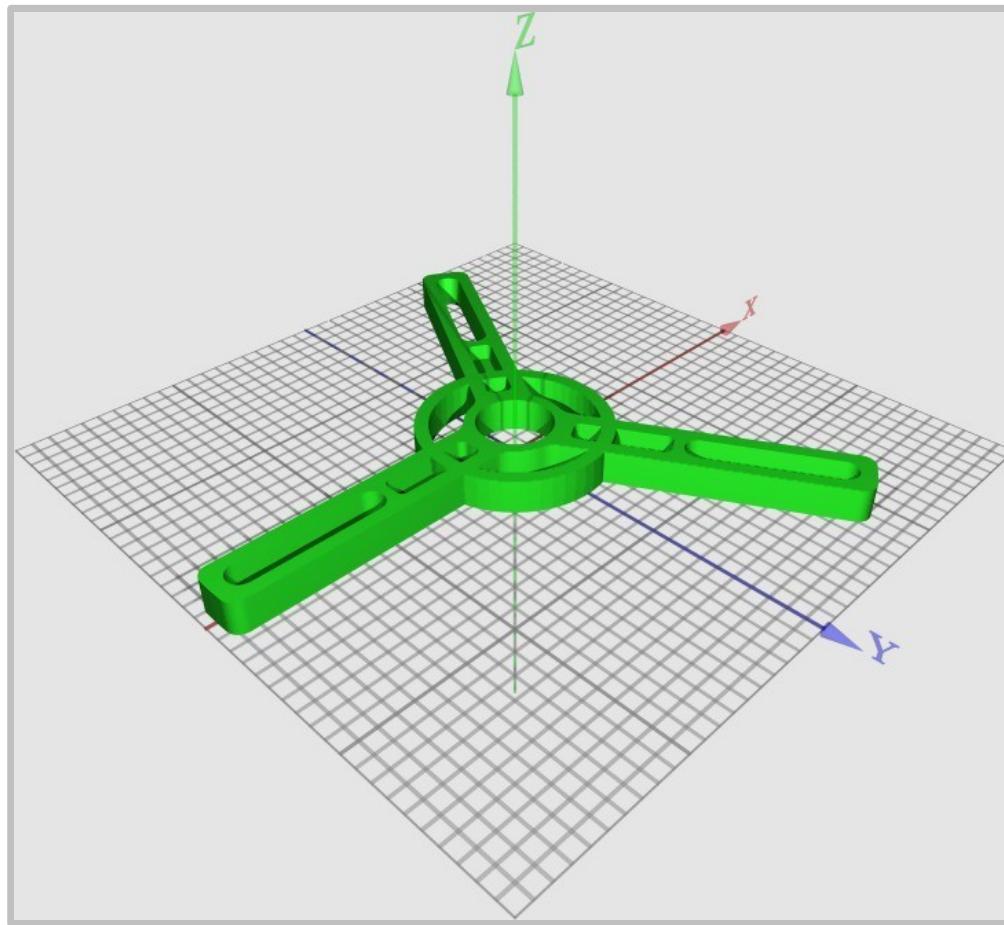
Source: <http://www.thingiverse.com/thing:3866>

A spool for the RepRap Mendel: an improvement (01)



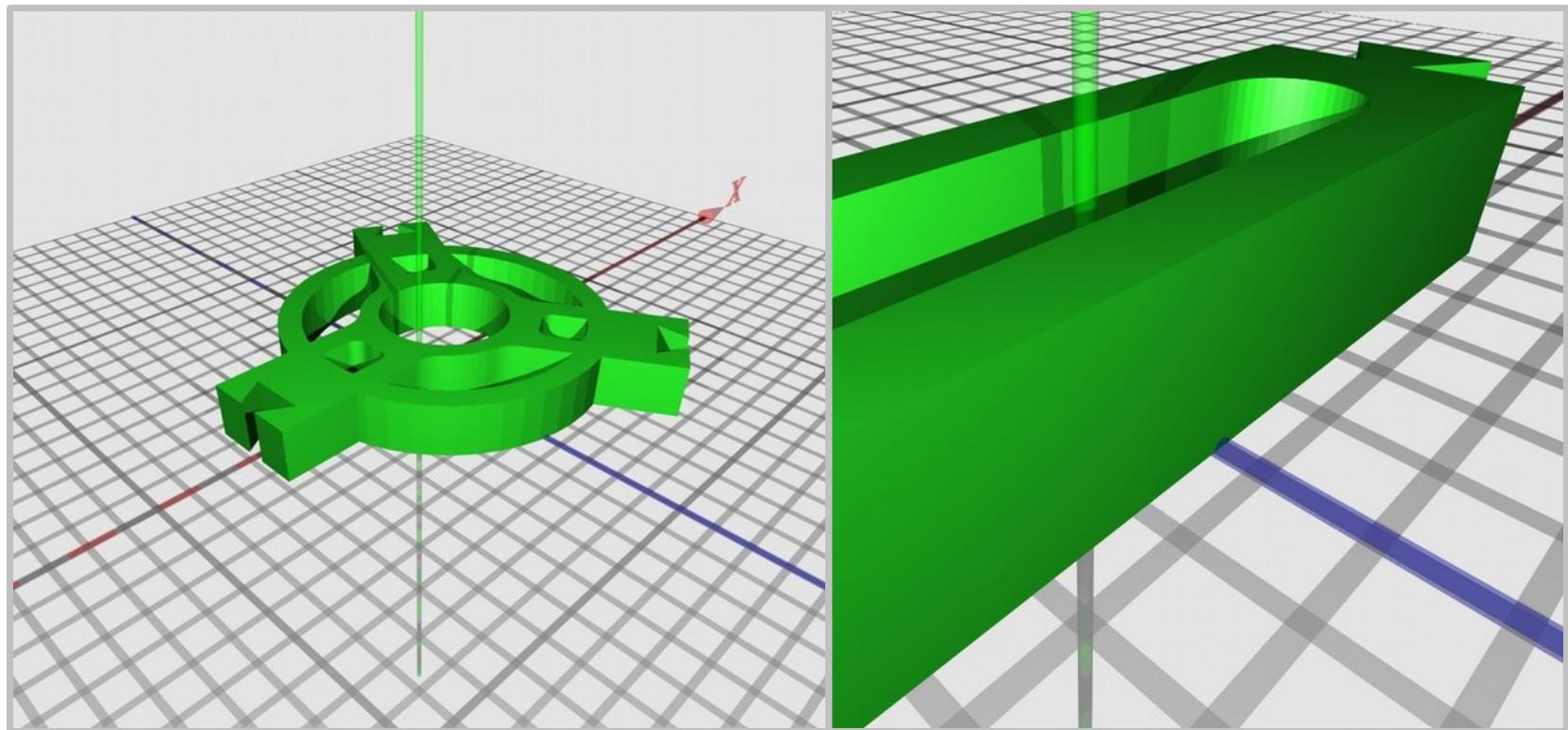
"Well i wanted to have a very simple, but bearing based spool system." Camiel

A spool for the RepRap Mendel: an improvement (02)



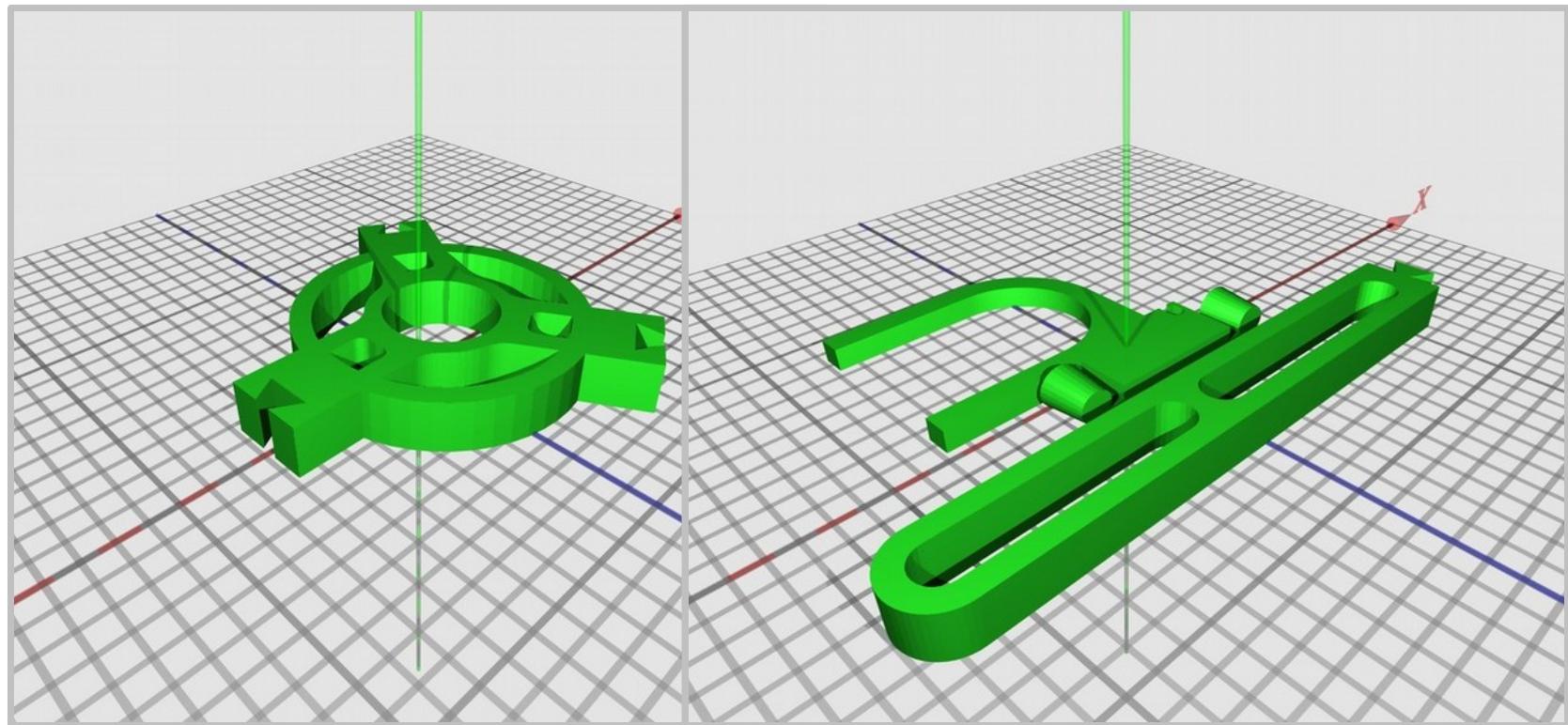
"I have changed the design to put the bearings in the spool itself. This way you can be more flexible in what you use to support the axle." Brokentoaster

A spool for the RepRap Mendel: an improvement (03)



"I liked BrokenToaster's idea of a bearing-driven filament spool holder, but that version was too big to fit on a Makerbot print bed. [...]" Randyy

A spool for the RepRap Mendel: an improvement (04)



“This takes advantage of the larger print area on RepRaps by printing the arm as one piece, [...] also saving material.” Fil

SVN Client + File comparison: TortoiseSVN (Win)

TortoiseSVN *the coolest interface to (Sub)version control*

Home | Donate | Downloads | Translations | Support/Docs | Other tools



TortoiseSVN

About TortoiseSVN
TortoiseSVN is an easy-to-use SCM / source control software for Microsoft Windows and possibly the best standalone Apache™ Subversion® client there is. It is implemented as a Windows shell extension, which makes it integrate seamlessly into the Windows explorer. Since it's not an integration for a specific IDE you can use it with whatever development tools you like.

New version of grepWin
Posted on September 4, 2011

Subversion Client Windows
Download Now! Windows, Linux, OSX Subversion Repository Browser
www.aquafold.com

AdChoices ▾

A new version of **GrepWin** is available. This new version contains a few bugfixes and enhancements.

List of completed **issues**
Download from [here](#)

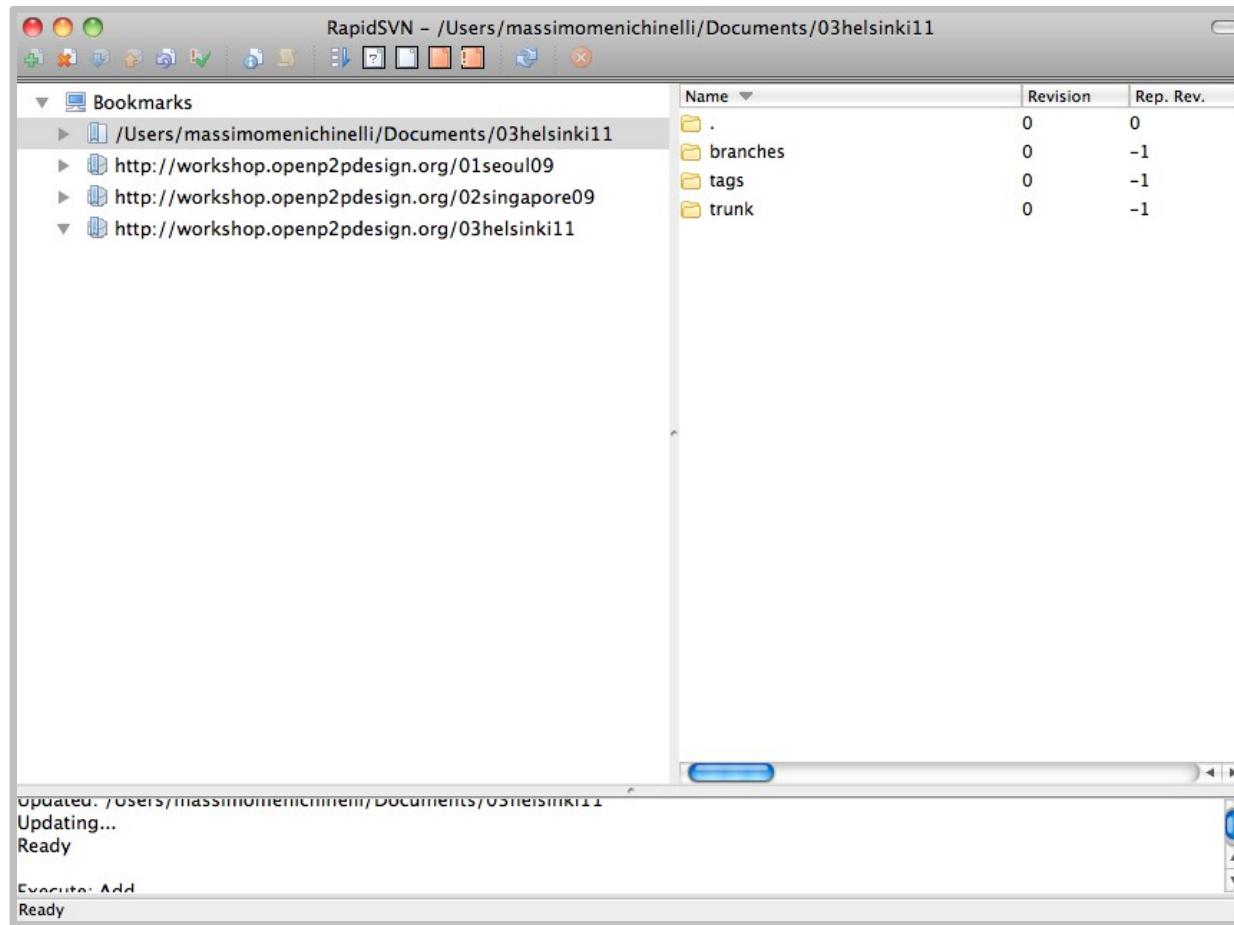
Release candidate of TortoiseSVN 1.7
Posted on September 1, 2011

Info
News
[News archive](#)

The most popular SVN client on Windows, it can also compare images.

Source: <http://tortoisessvn.net/>

SVN Client: RapidSVN (Windows, Mac, Linux)



Open Source and multi-platform, but without file comparison.

SVN Client: Versions (Mac)

The screenshot shows the official website for Versions, a Subversion client for Mac. At the top, there's a navigation bar with links for SOFA, Home, Release Notes, Support, Buy, and Download. The main visual is a large green lotus flower growing out of a mound of grass against a dark background. Below the flower, the word "VERSIONS" is written in large white letters, with a yellow starburst containing "1.1" positioned above the letter "S". Underneath "VERSIONS", it says "SUBVERSION CLIENT FOR MAC". To the left, a text box contains the following text: "Versions offers the best way to work with Subversion on the Mac. Thanks to its clear-cut approach, you'll hit the ground running." To the right, there are two prominent buttons: a green one labeled "Download Now" with a download icon, and a blue one labeled "Buy for €39" with a shopping cart icon.

Versions offers the best way to work with
Subversion on the Mac. Thanks to its
clear-cut approach, you'll **hit the ground
running**.

Download Now

Buy for €39

Free trial for one month...

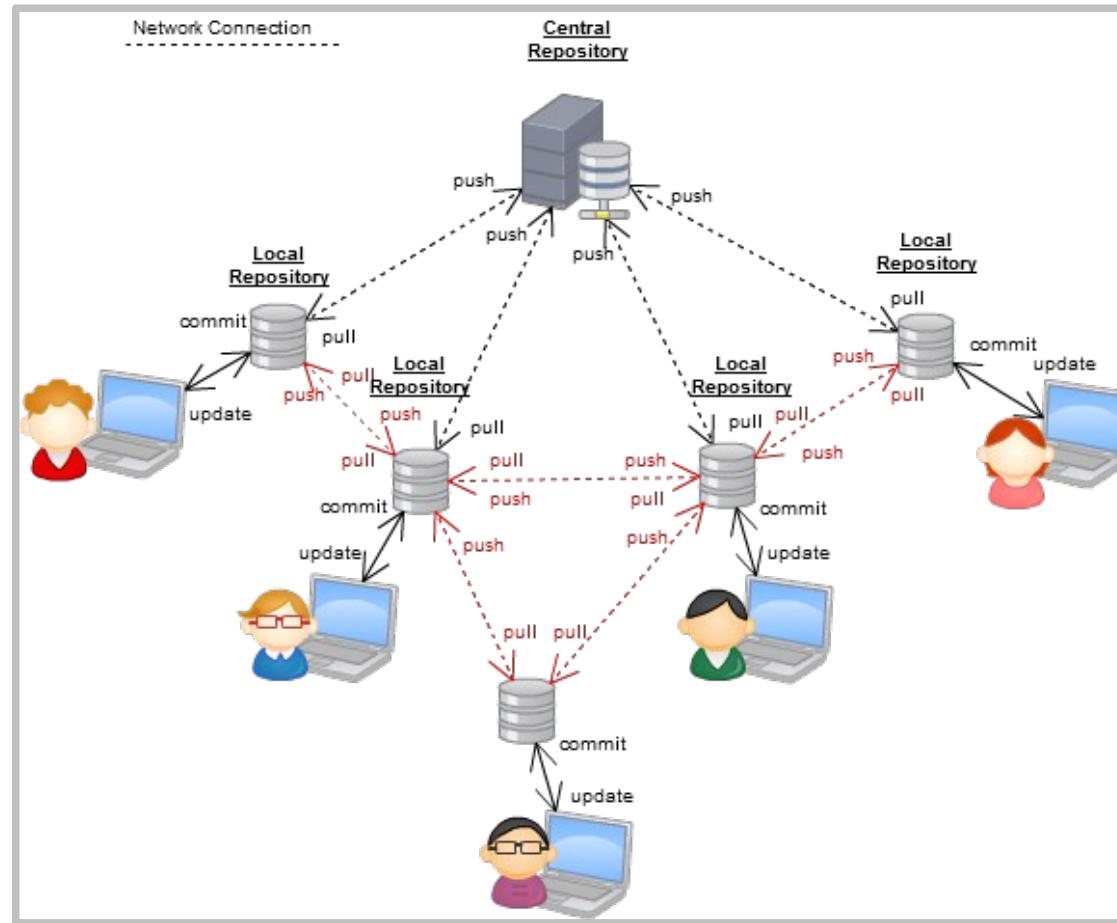


Aalto University
Media Factory

02.02

Version Control Systems: Git and Mercurial (Hg)

Distributed Version Control System



A more recent architecture, more evolved and popular. It usually tracks the state of the files, not just the changes.

Source: <http://www.kalekold.net/index.php?post=13>

<http://betterexplained.com/articles/intro-to-distributed-version-control-illustrated/>

Version Control System: the vocabulary (03)

Distributed Version Control Systems add new terms to the vocabulary:

- * **Clone**: create a working copy on your computer from another repository.
 - * **Push** : send a change to another repository (may require permission), even to your server.
 - * **Pull** : download the latest changes from an online repository.
-

Distributed Version Control System: Git

The screenshot shows the official Git website at <http://git-scm.com/>. At the top, there's a logo with the word "git" and the tagline "--local-branching-on-the-cheap". A search bar is on the right. Below the header, a brief introduction states: "Git is a **free and open source** distributed version control system designed to handle everything from small to very large projects with speed and efficiency." Another paragraph highlights its ease of learning, fast performance, and unique features like cheap local branching, convenient staging areas, and multiple workflows. A "Try Git" button with a cartoon character icon is present. To the right, a diagram illustrates the distributed nature of Git with multiple repositories connected by various colored lines (red, blue, green, yellow) on a grid background. The main content area has sections for "About", "Documentation", "Downloads", and "Community". On the right side, a large monitor displays the latest stable release as "1.8.2.2" with a "Download for Mac" button. At the bottom, links for "Pro Git" (a book), "Mac GUIs", and "Tarballs" are shown.

git --local-branching-on-the-cheap

Search entire site...

Git is a **free and open source** distributed version control system designed to handle everything from small to very large projects with speed and efficiency.

Git is **easy to learn** and has a **tiny footprint with lightning fast performance**. It outclasses SCM tools like Subversion, CVS, Perforce, and ClearCase with features like **cheap local branching**, convenient **staging areas**, and **multiple workflows**.

 Learn Git in your browser for free with **Try Git**.

 **About**
The advantages of Git compared to other source control systems.

 **Documentation**
Command reference pages, Pro Git book content, videos and other material.

 **Downloads**
GUI clients and binary releases for all major platforms.

 **Community**
Get involved! Mailing list, chat, development and more.

 **Pro Git** by Scott Chacon is available to read online for free. Dead tree versions

Latest stable release
1.8.2.2
[Release Notes \(2013-04-26\)](#)

[Download for Mac](#)

 **Mac GUIs**

 **Tarballs**

Developed by Linus Torvalds, for improving the distributed development of the Linux Kernel.

Source: <http://git-scm.com/>

An introduction to Git

Pro Git professional version control

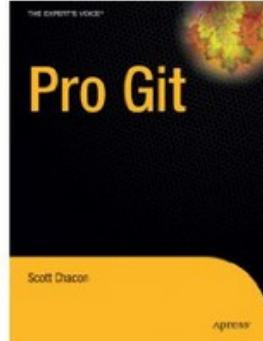
[Home](#) [Book](#) [Blog](#) [About](#) [Support Us](#) [GitHub](#) [Twitter](#)

1. Getting Started

- 1.1 - [About Version Control](#)
- 1.2 - [A Short History of Git](#)
- 1.3 - [Git Basics](#)
- 1.4 - [Installing Git](#)
- 1.5 - [First-Time Git Setup](#)
- 1.6 - [Getting Help](#)
- 1.7 - [Summary](#)

2. Git Basics

- 2.1 - [Getting a Git Repository](#)
- 2.2 - [Recording Changes to the Repository](#)



The book cover for "Pro Git" by Scott Chacon, published by Apress. The cover is black with yellow text and features a colorful, abstract graphic at the top right.

Support this site by buying a print version of [Pro Git](#)

An open source book about using Git.

Git project hosting: GitHub.com

The screenshot shows the GitHub homepage. At the top, it displays "github" in a logo, "Signup and Pricing", "Explore GitHub", "Features", "Blog", and "Login". A prominent banner states "1,568,188 people hosting over 2,693,380 repositories". Below the banner is a search bar with the placeholder "Find any repository" and a list of popular projects: jQuery, reddit, Sparkle, curl, Ruby on Rails, node.js, ClickToFlash, Erlang/OTP, CakePHP, Redis, and many more. Logos for various companies are displayed below the search bar, including Facebook, Twitter, Microsoft, VMware, Red Hat, LinkedIn, and Mozilla. Two boxes are shown side-by-side: one for "git" (version control system) and one for "git·hub" (collaboration platform). A central call-to-action button says "Plans, Pricing and Signup" with the subtext "Unlimited public repositories are free!". Below this, a list of features includes "Free public repositories, collaborator management, issue tracking, wikis, downloads, code review, graphs and much more...". A horizontal line separates this from a section with four categories: "Team management", "Code review", "Reliable code hosting", and "Open source collaboration", each with a brief description and a "More about" link.

github

Signup and Pricing Explore GitHub Features Blog Login

1,568,188 people hosting over 2,693,380 repositories

jQuery, reddit, Sparkle, curl, Ruby on Rails, node.js, ClickToFlash, Erlang/OTP, CakePHP, Redis, and many more

Find any repository

facebook. twitter. Microsoft. vmware. redhat. LinkedIn. mozilla

git /'git/
Git is an extremely fast, efficient, distributed version control system ideal for the collaborative development of software.

git·hub /'git,həb/
GitHub is the best way to collaborate with others. Fork, send pull requests and manage all your **public** and **private** git repositories.

Plans, Pricing and Signup
Unlimited public repositories are **free!**

Free public repositories, collaborator management, issue tracking, wikis, downloads, code review, graphs and much more...

Team management
30 seconds to give people access to code. No SSH key required. Activity feeds keep you updated on progress.
[More about collaboration](#)

Code review
Comment on changes, track issues, compare branches, send pull requests and merge forks.
[More about code review](#)

Reliable code hosting
We spend all day and night making sure your repositories are **secure**, **backed up** and **always available**.
[More about code hosting](#)

Open source collaboration
Participate in the most important open source community in the world today—online or at one of our meetups.
[More about our community](#)

The most popular (and refined) Git hosting available now, free plans for open source projects (you have to pay for private spaces).

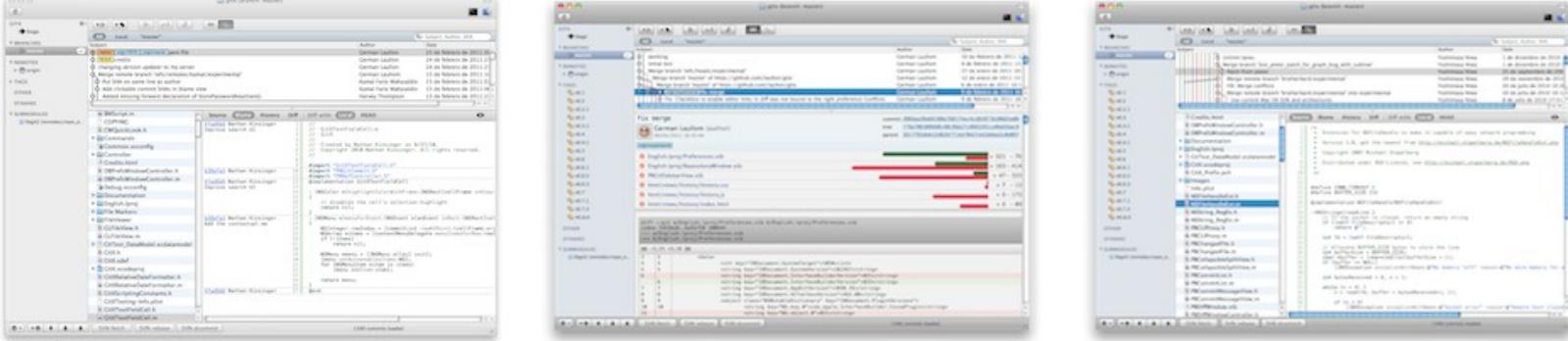
Source: <https://github.com/>

Git Client: GitX (Mac)



GitX (L)
Open Source Mac OS X Git client

[Download GitX \(L\) v0.8.4](#)
[License GPL v2](#)



Commit view

- Commit/Parents/Tree SHA links
- File changes counts
- File Diffs
- Commit Tags and Refs

File view

- Source Code Highlight
- Blame
- File History (log)
- Diff with local and HEAD

Sidebar

- Branches
- Remotes
- Stashes
- Submodules

Stage view

- Unstaged/Staged files
- Stage/Discard by lines
- Amend
- File diff

Actually, more than one GitX can be found...

Git project hosting: Gitorius.org

The screenshot shows the Gitorius.org website. The top navigation bar includes links for HOME, ABOUT, CONTACT, REGISTER, and LOG IN. The main headline reads "The best way to collaborate on distributed open source projects". Below it, a sub-headline states "Gitorious provides free open source infrastructure for open source projects that use Git." A call-to-action button says "TRY IT — it's free!" followed by "— OR —" and a "LOG IN" button. The bottom section, titled "FEATURES — what we bring to the table.", lists six features with icons: Project hosting (repo icon), Activity monitoring (RSS icon), Public merge requests (two people icon), Project Wikis (book icon), Team contributions (two people icon), and Project centric (database icon). To the right, a project dashboard for "gitorious" is shown, displaying repository details like "git://gitorious.local/gitorious/gitorious.git", branches (master), and activity logs with entries from "johan".

GITORIOUS

HOME ABOUT CONTACT | REGISTER LOG IN

The best way to collaborate on distributed open source projects

Gitorious provides free open source infrastructure for open source projects that use Git.

LEARN MORE [ABOUT](#) OR [THE PROJECTS WE HOST](#).

TRY IT — it's free! — OR — LOG IN

FEATURES — *what we bring to the table.*

Project hosting
Host your open source projects and their repositories for free on Gitorious to enable community contributions.

Project Wikis
Document your project using Gitorious' built-in wiki.

Activity monitoring
Keep track of project activity for both your personal projects and team projects.

Team contributions
Create development teams to encourage and organize cooperative development.

Public merge requests
Allow other developers to submit contributions to your project and merge them easily.

Project centric
Maintain all code repositories related to a single project under a single project area on Gitorious.

gitorious → gitorious

git://gitorious.local/gitorious/gitorious.git

Branches: master

Commit log Source tree Merge requests (0)

Activities

Wednesday April 07 2010

PUSH 07:49 johan commented on gitorious/gitorious/22e03ac
Ipsum decided to leave for the Far World of Grammar.

PUSH 07:49 johan commented on gitorious/gitorious/22e03ac
place and supplies it with the necessary regelatio. It is a p

Source: <http://www.gitorious.org/>

Free plans, and open source software itself.

Distributed Version Control System: Mercurial (hg)

The screenshot shows the Mercurial website homepage. At the top, there's a navigation bar with links for 'about', 'guide', 'download', 'extensions', 'news/wiki', and 'sponsors'. A search bar says 'Search the Wiki' with a magnifying glass icon. The main heading 'Work easier Work faster' is displayed above a paragraph about Mercurial being a free, distributed source control management tool. To the right, a large blue button says 'Download now' with a 'Mercurial 2.0.2' link and a 'Mercurial 2.0.2 for Mac OS X' link. Below this, there's a section for 'Another OS?' with links for 'Mac OS X', 'Windows', and 'other'. On the left, under 'How you can benefit from Mercurial', there are three icons with text: a lightbulb for 'fast and powerful', a brain for 'easy to learn', and a hand for 'just works'. On the right, under 'Quick Start', there are two sections with terminal command examples: 'Clone a project and push changes' and 'Create a project and commit'.

Work easier
Work faster

Mercurial is a free, distributed source control management tool. It efficiently handles projects of any size and offers an easy and intuitive interface.

Download now
Mercurial 2.0.2
Mercurial 2.0.2 for Mac OS X

Another OS?
Get Mercurial for:
» Mac OS X
» Windows
» other

How you can benefit from Mercurial

- It is **fast and powerful**
Mercurial efficiently handles [projects of any size and kind](#). Every clone contains the whole project history, so most actions are local, fast and convenient. Mercurial supports a multitude of [workflows](#) and you can easily enhance its functionality with [extensions](#).
- It is **easy to learn**
You can follow our simple [guide](#) to learn how to revision your documents with Mercurial, or just use the [quick start](#) to get going instantly. A short overview of Mercurial's decentralized model is also [available](#).
- And it just works
Mercurial strives to deliver on each of its promises. Most tasks simply work on the first try and without requiring arcane knowledge.

Quick Start

Clone a project and push changes

```
$ hg clone http://selenic.com/repo
$ cd hello
$ (edit files)
$ hg add (new files)
$ hg commit -m 'My changes'
$ hg push
```

Create a project and commit

```
$ hg init (project-directory)
$ cd (project-directory)
$ (add some files)
$ hg add
$ hg commit -m 'Initial commit'
```

Open Source and distributed as Git, usually the most used in FabLabs.

An introduction to Mercurial

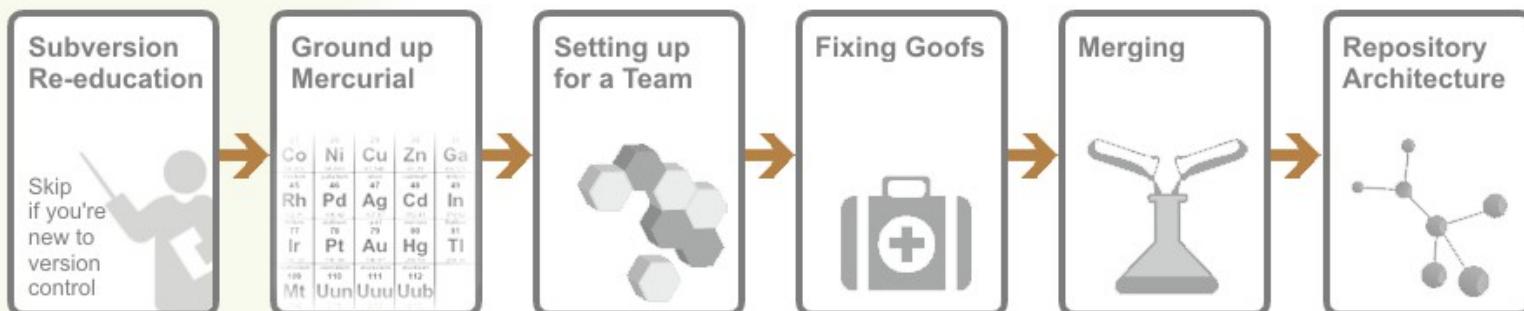
80

Hg Init

200.59

Hg Init: a Mercurial tutorial

Mercurial is a modern, open source, distributed version control system, and a compelling upgrade from older systems like Subversion. In this user-friendly, six-part tutorial, [Joel Spolsky](#) teaches you the key concepts.



A complete and easy introduction to using Mercurial.

Git / Hg project hosting: Bitbucket.org

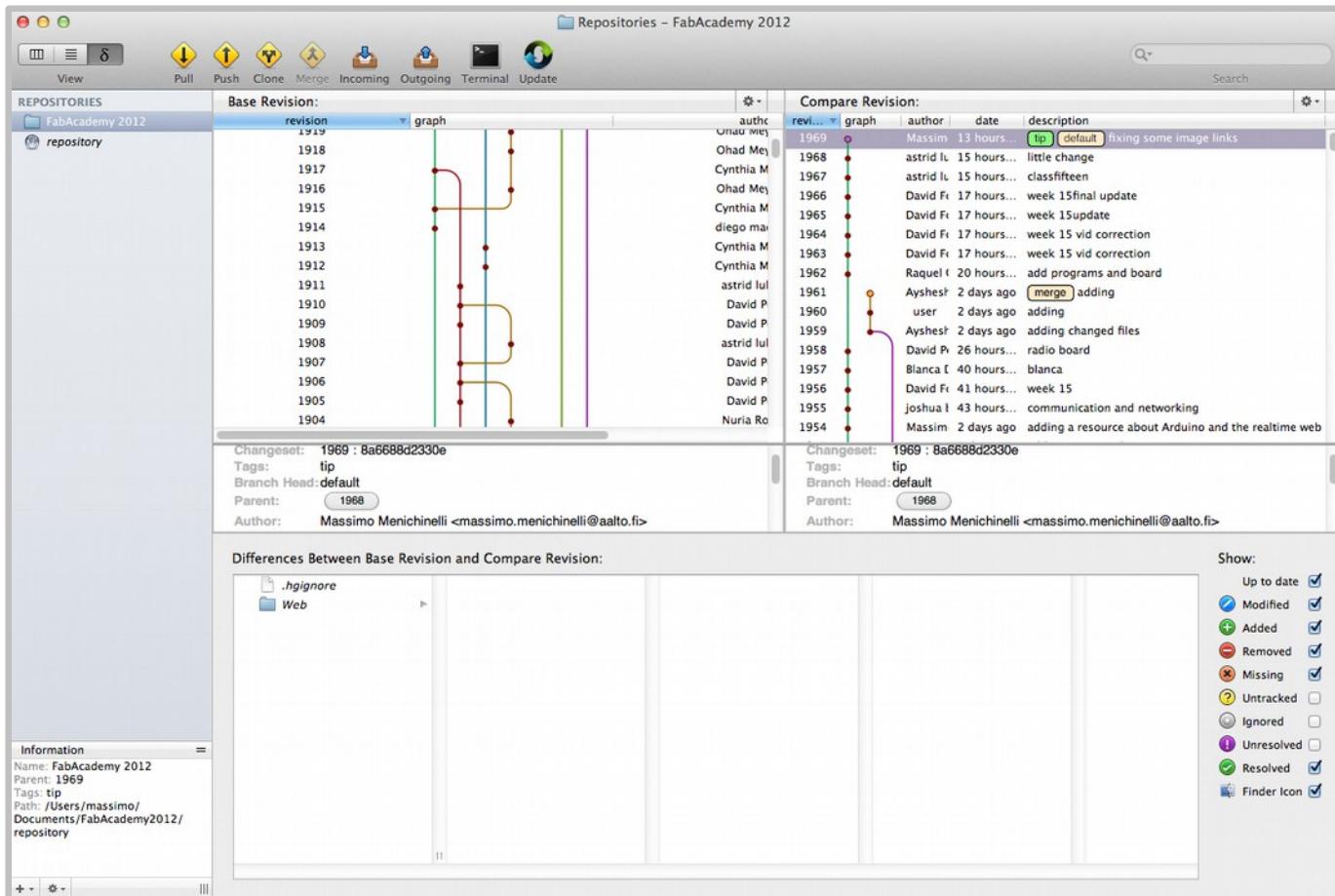
The screenshot shows the Bitbucket homepage with a banner for "Unlimited DVCS Code Hosting, Free". Below the banner, there's a yellow button labeled "SIGN UP NOW, FREE UNLIMITED PRIVATE REPOS". To the right, a repository interface is displayed, showing a pull request titled "BB-717: Add 'task' as an issue type". The interface includes tabs for Overview, Discussions, Pull requests, Search, and Admin. Below the pull request, there's a commit history with one entry from "Javier Neh" dated "2011-07-29". The commit message is "BB-717: add 'task' as an issue type, and fix saving issue defaults over ajax". The repository URL is "https://bitbucket.org/mvnegas/staging".

Bitbucket Features

- Accepted** by Dylan_Elio 3 days ago
- All changes have been pulled and merged in dylan...
- Fork, code, pull**
- Pull requests make it simple for contributors to fork a repo, make a change, and request a merge. Code commenting makes agile reviews a breeze.
- Secure code hosting**
- Browse and search your repository from the web. Every commit, directory, file and line gets a unique URL.
- Collaborate and get social**
- Give your work a home on the web. Share what you're working on with your colleagues, collaborators or potential employers.
- Old repository**
- Source: Subversion
- URL: Import: https://bitbucket.org/import/bitbucket-and-crowd/trunk
- Contractors: (none)
- Default access: (none)
- Brodie Fox (brodi)
- David (davidchambers)
- Dave Eberly
- Erik van Zijl (erikvzj)
- joseph
- Mahmud S. Celalbas (mcelabas)
- Natalia Vargas (nataliav)
- Unlimited repositories**
- Keep all your code in one place, using Git or Mercurial without having to pay for new repos. Use our Subversion importer to migrate to DVCS.
- Work as a team**
- With group-based permissions, user management is easy and ensures everyone has access to the code they need.
- Integrate**
- Integrates with email, Twitter, Jenkins, JIRA, Pivotal, Lighthouse and more. Use our REST API to create your own integration.

For both Git and Hg, free plan also for private projects.

Mercurial (hg) client: MacHg



Much better than the terminal for starting, and it has Mercurial packaged (no need to install it separately).

File comparison: Kaleidoscope (Mac)

Compare files with...

KALEIDOSCOPE

Use Kaleidoscope to **spot the differences** in text and image files. Review changes in seconds with the world's **most advanced** file comparison application.

[Download ↓](#) [Buy for €29 ❤](#)

[30 Day Demo](#) [Introductory Price](#)

[Learn more...](#)

A large, semi-transparent watermark of the Kaleidoscope software interface is visible on the right side of the page. It features a vibrant, multi-colored triangular color wheel at the top right. Below it, there are several small windows showing file comparison results, including text and image scopes.

Text Scope
Compare text and source code

Image Scope
Review mockups and photos

Workflow
Integrate with just about anything

Details
Skim through the feature list

Free trial for one month...

File comparison: Perforce P4Merge (Win, Mac, Linux)

 **PERFORCE**

Company Partners Resources

Products Downloads Documentation Customers Services Purchase Support

Create. Develop. Version everything with Perforce.

Only Perforce products have the Perforce Server – the fast version management platform that powers productive teamwork. Built from the ground up to be scalable and easy to manage, Perforce helps thousands of the world's leading organizations innovate and succeed.

NYSE Euronext. uses Perforce throughout the entire technology lifecycle of the exchange.

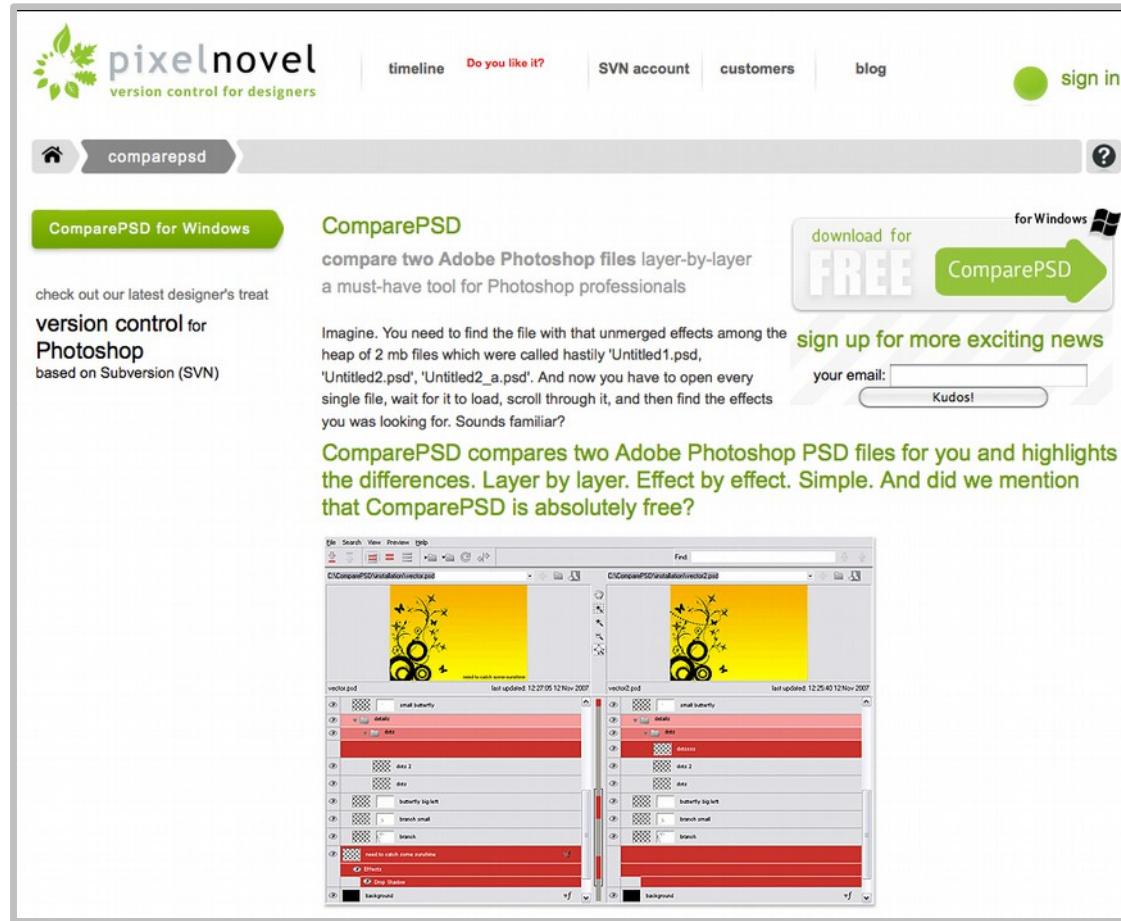
"We're really not even close to maxing out the scalability of the Perforce server."

Why Perforce Get the fast track on better SCM... **Try Perforce** Free 2 user trial or multi-seat evaluation...  Get the Perforce 2011.1 Beta Release. Check out the [beta features](#) or [download the beta now](#).

Perforce is another version control system, but it is interesting for its visual diff applications (freeware).

Source: http://www.perforce.com/product/components/perforce_visual_merge_and_diff_tools

File comparison: ComparePSD (Windows)



Freeware for Windows, can compare Photoshop .psd files.

Source: <http://pixelnovel.com/comparepsd/>

Subversion hosting service: Pixelnovel

The screenshot shows the Pixelnovel website's SVN account section. At the top, there's a navigation bar with links for 'timeline', 'Do you like it?', 'SVN account', 'customers', and 'blog'. On the right, there's a 'sign in' button. Below the navigation, a breadcrumb trail shows 'account' as the current page. The main heading is 'PIXELNOVEL ACCOUNT IS A SUBVERSION HOSTING FOR DESIGNERS'. To the left, there are two buttons: 'SVN account' (highlighted) and 'Pricing & plans'. The central content area lists several features in a bulleted list:

- 3 plans for your convenience, a **free account** is available
- View all your files online along with **previews and history***
- Is based on Subversion (SVN), a proved version control system
- Add more users to your account and manage their rights

* only available if used along with Timeline, the Subversion client for Adobe Creative Suite

On the right side of the feature list are two buttons: 'SEE PLANS' and 'SIGN UP'.

“If you don't have your own SVN repository, a PixelNovel account will provide you with a hassle-free alternative, plus you get the extra features such as user management system and automatic back up

Integrated with Photoshop: free plan (100 MB) and better paid plans.

Source: <http://pixelnovel.com svn-account/>

SVN / Git / Hg hosting service: Beanstalk

The screenshot shows the Beanstalk website homepage. At the top, there is a dark navigation bar with links for Home, Feature Tour, Partners & Tools, API, Guides, Blog, Pricing & Sign Up. Below the navigation is the Beanstalk logo, which features a stylized green leaf icon above the word "beanstalk". A tagline below the logo reads "The easiest way to manage code, collaborate and deploy." The page is divided into three main sections: "Version Control", "Collaboration", and "Deployments", each with a brief description and an icon. Below these sections is a yellow banner featuring the HappyCog logo (a black gear with "HAPPY COG EST.1999" text) and the text "HappyCog easily scales for an MTV audience with Beanstalk". It also includes a "Read the story" button and a "View Plans & Pricing" link. At the bottom, there is a section titled "Our customers:" with logos for Wufoo, Philips, Brightcove, blue flavor, and Hello Enjoy.

Paid plans (with free trial).

SVN / Git hosting service: Codesion

The screenshot shows the homepage of the Codesion website. At the top, there's a navigation bar with links for 'Login', 'Status Site', 'Help', 'Get Free Hosting', 'SIGN UP', and several menu items: 'Tour', 'Partners', 'Buzz', 'Training', 'Blog', and 'Pricing & Signup'. A green frog logo is on the left, with a note 'we're now COLLABNET.' next to it. The main headline reads 'GET G+ ON CODESION' in large green letters. Below it is a list of features: 'Git and Subversion Hosting under the same roof', 'Enterprise Security, Backup & Support', and 'Scalable and Guaranteed 99% Uptime SLA'. To the right, there are three call-to-action boxes: 'WATCH DEMO' (with a link to see how it works), 'FREE TRIAL' (with a link to try it for 30 days), and 'CONTACT US'. At the bottom, there are three sections: 'EUROPEAN DATA CENTER NOW LIVE' (with a link to request access), 'INSTANT SUBVERSION AND GIT' (with a link to check it out), and 'PCI LEVEL 1 COMPLIANT SECURITY' (with a link to more security details). The footer has an orange horizontal bar with the text 'Paid plans (with free trial)'.

codesion CLOUD SERVICES

we're now COLLABNET.

Get Free Hosting

SIGN UP

Tour Partners Buzz Training Blog Pricing & Signup

GET G+ ON CODESION

- Git and Subversion Hosting under the same roof
- Enterprise Security, Backup & Support
- Scalable and Guaranteed 99% Uptime SLA

TRY IT

1 2 3 4

Serving 70,000 active users in 90 countries

EUROPEAN DATA CENTER NOW LIVE

Request Access

INSTANT SUBVERSION AND GIT

Check It Out

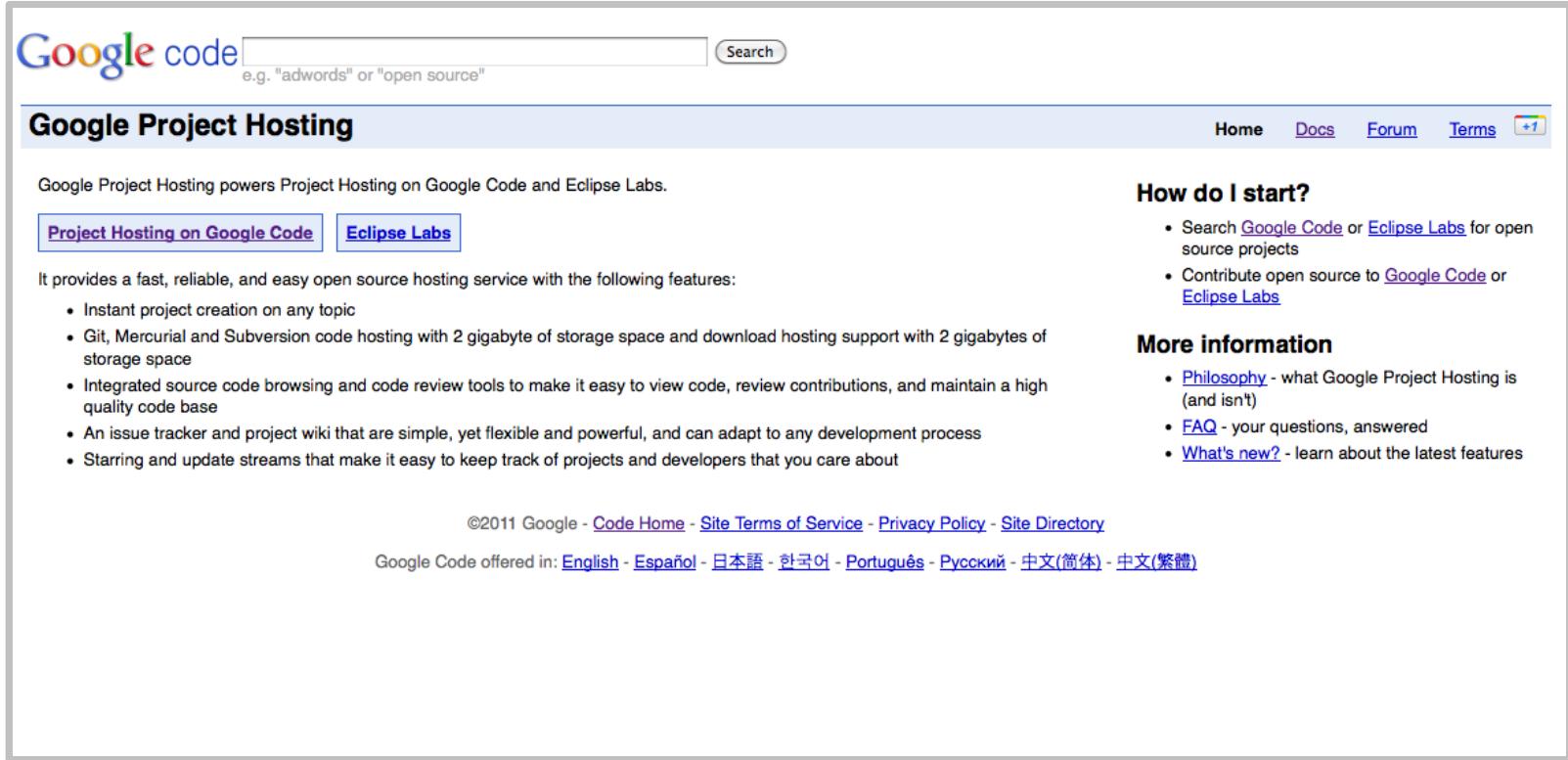
PCI LEVEL 1 COMPLIANT SECURITY

More on Security

PCI

Paid plans (with free trial).

SVN / Git / Hg hosting service: Google Code



The screenshot shows the Google Project Hosting homepage. At the top, there's a search bar with placeholder text "e.g. 'adwords' or 'open source'" and a "Search" button. Below the search bar, the title "Google Project Hosting" is displayed in a large, bold, dark blue font. To the right of the title are links for "Home", "Docs", "Forum", "Terms", and a plus sign icon. A horizontal line separates the header from the main content area. In the main content area, there's a brief introduction: "Google Project Hosting powers Project Hosting on Google Code and Eclipse Labs." Below this, two buttons are visible: "Project Hosting on Google Code" and "Eclipse Labs". A paragraph explains the service: "It provides a fast, reliable, and easy open source hosting service with the following features:" followed by a bulleted list of features. At the bottom of the page, there are copyright and language information.

Google code e.g. "adwords" or "open source"

Google Project Hosting

Google Project Hosting powers Project Hosting on Google Code and Eclipse Labs.

[Project Hosting on Google Code](#) [Eclipse Labs](#)

It provides a fast, reliable, and easy open source hosting service with the following features:

- Instant project creation on any topic
- Git, Mercurial and Subversion code hosting with 2 gigabyte of storage space and download hosting support with 2 gigabytes of storage space
- Integrated source code browsing and code review tools to make it easy to view code, review contributions, and maintain a high quality code base
- An issue tracker and project wiki that are simple, yet flexible and powerful, and can adapt to any development process
- Starring and update streams that make it easy to keep track of projects and developers that you care about

©2011 Google - [Code Home](#) - [Site Terms of Service](#) - [Privacy Policy](#) - [Site Directory](#)
Google Code offered in: [English](#) - [Español](#) - [日本語](#) - [한국어](#) - [Português](#) - [Русский](#) - [中文\(简体\)](#) - [中文\(繁體\)](#)

Free for open source projects.



Aalto University
Media Factory

03. QR Code: bits about a project from its atoms

Retrieving the source code of an object

The screenshot shows a blog post titled "ARDUINO TOOL THAT CONNECTS EACH BOARD TO ITS OWN SOURCE" by Dave Vondle on March 15, 2012. The post includes a screenshot of the Arduino IDE interface with the "Tools" menu open, highlighting the "Retrieve Source" option. Below the screenshot, there is a paragraph explaining the problem of lost source code for physical devices and a link to a GitHub page.

15 MAR '12 ARDUINO TOOL THAT CONNECTS EACH BOARD TO ITS OWN SOURCE BY DAVE VONDLE

If you create something with Arduino and put it out into the world, there is no well-established link to the source. If you personally made the device, the source can get lost over time. If you didn't create it, you could have a tough time tracking the source down. You have the physical device, why can't it tell you where its code lives?

I made a tool for Arduino called "Upload-And-Retrieve-Source" that for the most part solves this problem.

Github page [here](#), direct download link [here](#)

HOME ABOUT CONTACT

ABOUT IDEO LABS

IDEO Labs is a place where we can show bits of what we're working on, talk about prototyping, and share our excitement over the tools that help us create.

MORE

SUBSCRIBE TO RSS

CATEGORIES

- 3D
- Arduino
- flash
- Hack
- iPhone
- multi-touch
- open source

What about retrieving the information about a project, in order to be able to modify it? If we work with Arduino, there is this software from IDEO.

Source: <http://labs.ideo.com/2012/03/15/arduino-tool-that-connects-each-board-to-its-own-source/>

Dead Drops: local (really!) information

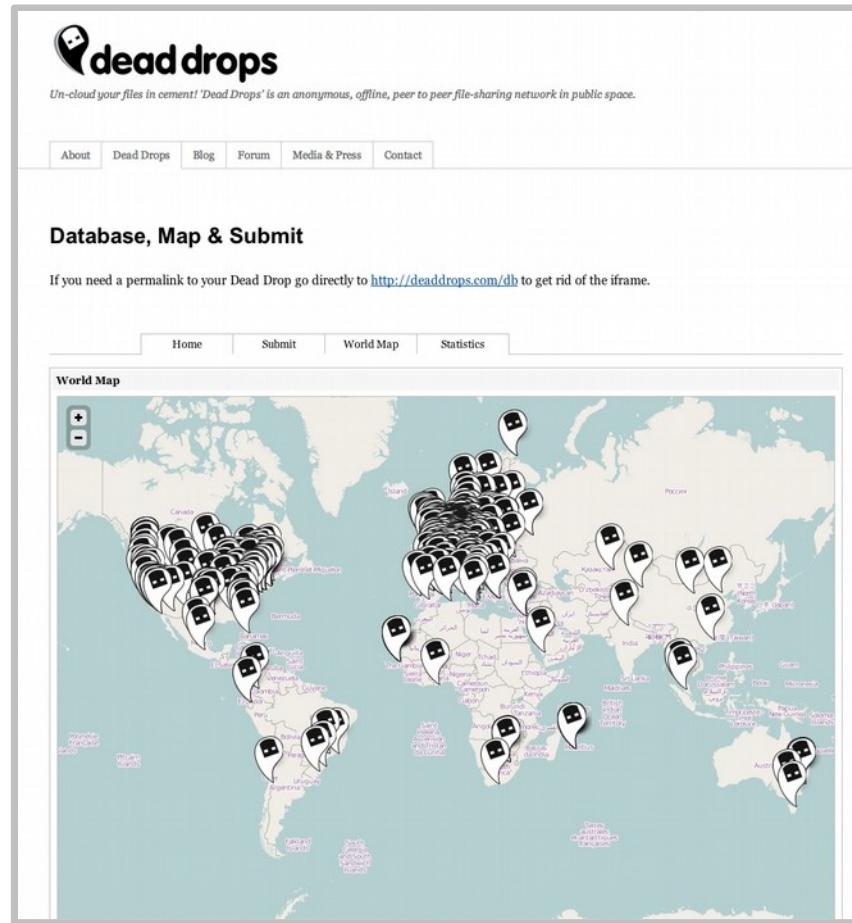
The screenshot shows the 'About' page of the Dead Drops website. At the top is the project's logo, a stylized 'dd' inside a circle, followed by the text 'dead drops'. Below the logo is a subtitle: 'Un-cloud your files in cement! "Dead Drops" is an anonymous, offline, peer to peer file-sharing network in public space.' A navigation bar below the subtitle includes links for 'About', 'Dead Drops', 'Blog', 'Forum', 'Media & Press', and 'Contact'. The main content area features a heading 'About' and a photograph of a small USB drive embedded in a brick wall. To the right of the main content is a sidebar containing a search bar, a 'Pages' section with a list of links, social sharing buttons (Facebook 'Like' and 'Flattr'), and a Twitter feed from the account @dead_drops.

'Dead Drops' is an anonymous, offline, peer to peer file-sharing network in public space. USB flash drives are embedded into walls, buildings and curbs accessible to anybody in public space. Everyone is invited to drop or find files on a dead drop. Plug your laptop to a wall, house or pole to share your favorite files and data. Each dead drop is installed empty except a readme.txt file explaining the project. 'Dead Drops' is open to participation. If you want to install a dead drop in your city/neighborhood follow the ['how to' instructions](#) and submit the location and pictures.

'Dead Drops' is an anonymous, offline, peer to peer file-sharing network in public space. USB flash drives are embedded into walls accessible to anybody.

Source: <http://deaddrops.com/>

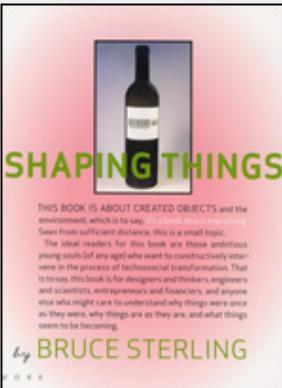
Dead Drops: how to find them



‘Dead Drops’ is an anonymous, offline, peer to peer file-sharing network in public space. USB flash drives are embedded into walls accessible to anybody.

Source: <http://deaddrops.com/dead-drops/db-map/>

Spime: sp(ace) + (ti)me of an object



Shaping Things
Bruce Sterling
Designed by Lorraine Wild

► [Table of Contents and Sample Chapters](#)

"*Shaping Things* is about created objects and the environment, which is to say, it's about everything," writes Bruce Sterling in this addition to the Mediawork Pamphlet series. He adds, "Seen from sufficient distance, this is a small topic."

Sterling offers a brilliant, often hilarious history of shaped things. We have moved from an age of artifacts, made by hand, through complex machines, to the current era of "gizmos." New forms of design and manufacture are appearing that lack historical precedent, he writes; but the production methods, using archaic forms of energy and materials that are finite and toxic, are not sustainable. The future will see a new kind of object—we have the primitive forms of them now in our pockets and briefcases: user-alterable, baroquely multi-featured, and programmable—that will be sustainable, enhanceable, and uniquely identifiable. Sterling coins the term "spime" for them, these future manufactured objects with informational support so extensive and rich that they are regarded as material instantiations of an immaterial system. Spimes are designed on screens, fabricated by digital means, and precisely tracked through space and time. They are made of substances that can be folded back into the production stream of future spimes, challenging all of us to become involved in their production. Spimes are coming, says Sterling. We will need these objects in order to live; we won't be able to surrender their advantages without awful consequences.

The vision of *Shaping Things* is given material form by the intricate design of Lorraine Wild. *Shaping Things* is for designers and thinkers, engineers and scientists, entrepreneurs and financiers—and anyone who wants to understand and be part of the process of technosocial transformation.

About the Author

Hugo Award-winning science fiction author and futurist Bruce Sterling has been called by *Time* "perhaps the sharpest observer of our media-choked culture working today in any genre." Three of his novels have been *New York Times* Notable Books of the Year, and he has been a contributing writer for *Wired* since its conception. In 2005 he is "Visionary-in-Residence" at Art Center College of Design, Pasadena. Bruce Sterling's blog *Beyond the Beyond* has been active since 2003.

ADD TO CART

Other Editions
[Cloth \(2005\)](#)

Series
[Mediaworks Pamphlets](#)

Spime is a neologism for a currently theoretical object that can be tracked through space and time throughout the lifetime of the object.

Source: <http://mitpress.mit.edu/catalog/item/default.asp?id=10603&ttype=2>
<http://en.wikipedia.org/wiki/Spime>

Evrythng.com

The screenshot shows the homepage of Evrythng.com. The header features the "EVRYTHNG" logo with a trademark symbol, set against a background of various icons related to technology and objects. The main navigation menu includes links for "LOG IN", "HOME", "PRODUCTS AND SERVICES", "ABOUT US", and "DEVELOPERS". A central black rectangular area contains a small white circle icon and a call-to-action button labeled "MORE ►". To the right of this area, there is a text box with the heading "Find out more about Active Digital Identities" and a subtext stating "We can help personalize individual products for every customer." Below this, another "MORE ►" button is visible. The bottom section of the page has a red header "Because every physical thing can be digitally connected." followed by a descriptive paragraph about EVRYTHNG's software engine for creating Active Digital Identities. It also features two sections: "Engine ►" and "Services ►", each with a list of bullet points and corresponding icons.

Because every physical thing can be digitally connected.

EVRYTHNG is a software engine for creating Active Digital Identities. These are unique online profiles for products and other objects to make them part of the Web. Now every physical thing can be digitally connected.

Engine ►

- Give a unique online profile to any physical thing
- Share and manage access with others
- Use a rich set of APIs to build apps and services

Services ►

- Design how to connect each product with customers
- Build connected product experiences and services
- Use our portfolio of existing product applications

EVRYTHNG is a software engine for creating Active Digital Identities, unique online profiles for objects to make them part of the Web and digitally connected.

Source: <http://evrythng.com/>

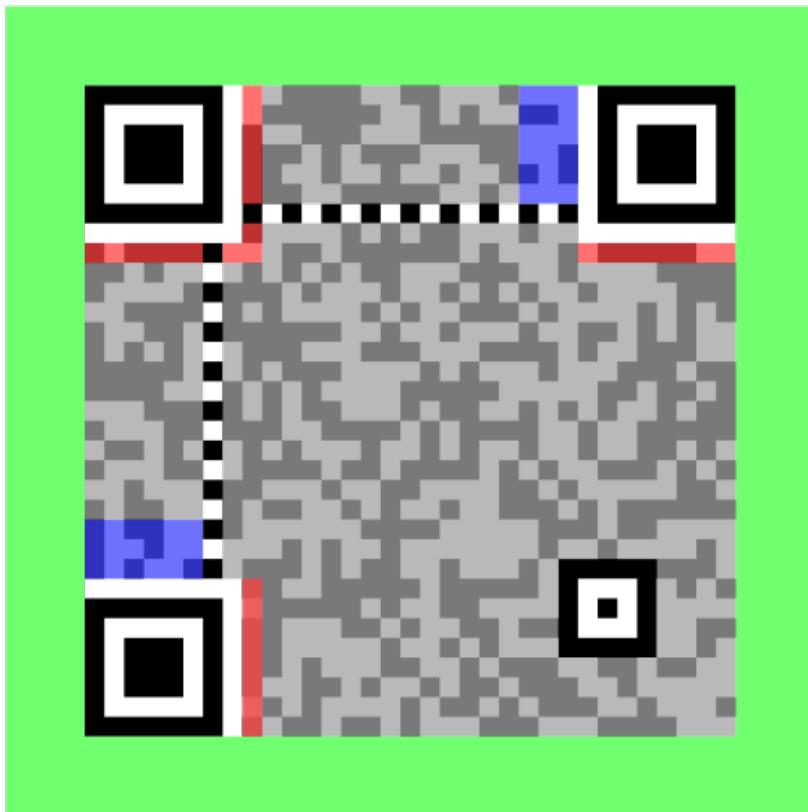
Tales of things (.com)

The screenshot shows the homepage of the Tales of things beta website. At the top, there's a logo with three fish and the text "It's a memory thing" above "tales of things beta". Below the logo is a search bar with placeholder text "Search things, tales and groups" and a magnifying glass icon. To the right of the search bar are navigation links: "tales of things", "my things", "world of things", "scan a thing", and "groups". There's also a "Login" button and input fields for "Username" and "Password". A large blue arrow-shaped callout on the left side contains the text "Connecting anything with any media, anywhere!" followed by a descriptive paragraph about linking objects to video memories or articles. On the right side of the arrow is a "Sign up and start sharing your tales" button with the subtext "It's free and anyone can join". Below the callout, there are sections for "Latest Things", "Recently Viewed", and "Popular Tales", each showing thumbnail images and titles like "Justin's Cartoon", "Chris's Cartoon", "Payton's Cartoon", "Maddie's Cartoon", "Kobe's Cartoon", "Wanted Poster", "Faith's Cartoon", "Karl's Poetry", and "Shan's Fairy ...". To the right of these is a "Learn More" section featuring a video player with a play button and a timestamp of "00:00", a "For iPhone and Android" section with an "App Store" badge, and an "Oxfam Shelflife" section with a "Powering Oxfam's Shelflife" heading and a "Download our new, free iPhone app to scan, comment and add location to things." message. At the bottom of the page, there's a footer with links to "Powered by TOTeM Labs © 2010 & Funded by the Digital Economy", "Help: support@talesofthings.com", "Info: info@talesofthings.com", "Media Enquiries: media@talesofthings.com", "About Terms and Conditions", "Privacy Policy", "FAQs", and "A collaboration between: Brunel University, Edinburgh College of Art, University College London, University of Dundee, University of Salford". There's also a "twitter follow us" link.

Tales of Things allows just that with a quick and easy way to link any media to any object via small printable tags known as QR codes.

Source: <http://www.talesofthings.com/>

Q(uick)R(esponse) Code



1. Version information
2. Format information
3. Data and error correction keys
4. Required patterns
 - 4.1. Position
 - 4.2. Alignment
 - 4.3. Timing
5. Quiet zone

QR Code is the trademark for a type of matrix / 2D barcode that can encode four standardized kinds of data (numeric, alphanumeric, byte/binary, Kanji).

Source: http://en.wikipedia.org/wiki/Qr_code

QR Code: data storage

The amount of data that can be stored in the QR Code symbol depends on the **datatype** (mode, or input character set), **version** (1,...,40, indicating the overall dimensions of the symbol), and **error correction level** (L[ow], M[edium], Q[uality], H[igh]). The maximum storage capacities are:

- * **Numeric only:** max. 7,089 characters (0, 1, 2, 3, 4, 5, 6, 7, 8, 9)
 - * **Alphanumeric:** max. 4,296 characters (0–9, A–Z [upper-case only], space, \$, %, *, +, -, ., /, :)
 - * **Binary/byte:** max. 2,953 characters (8-bit bytes) (23624 bits)
 - * **Kanji/Kana:** max. 1,817 characters
-

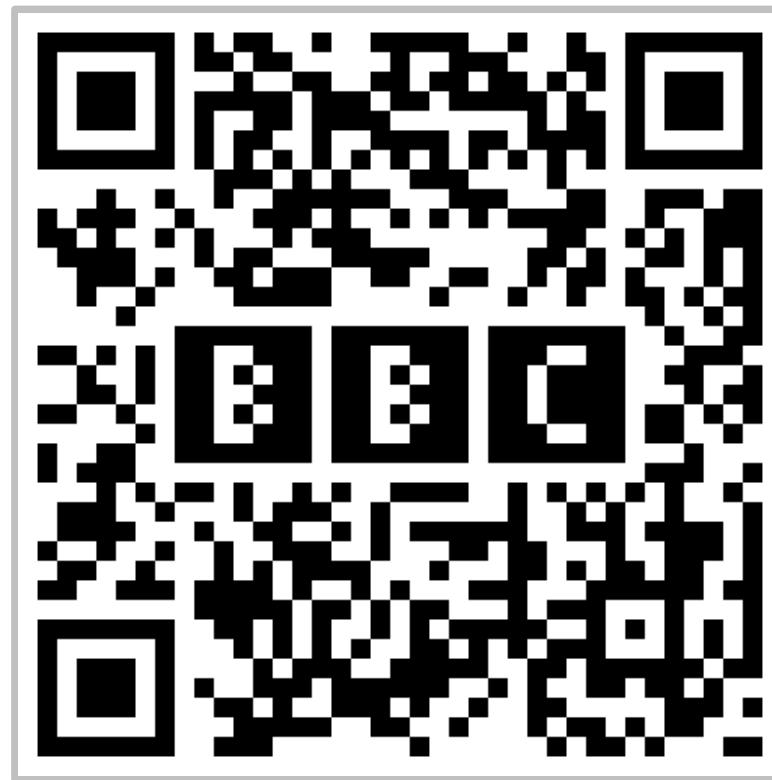
QR Code: data storage



The more information is encoded, the finer the details of the code.

Source: http://en.wikipedia.org/wiki/Qr_code

QR Code: error tolerance and customization



You can “hack” a QR Code thanks to its tolerance to errors.

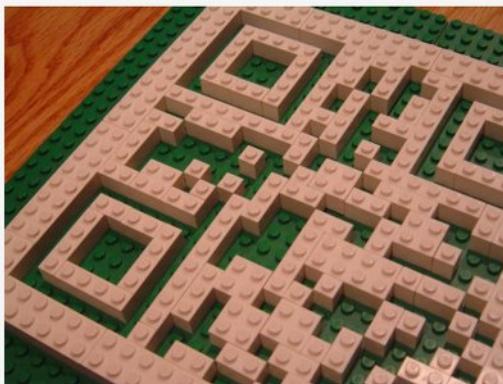
QR Codes: not just printed paper

QR codes in Lego

I've been experimenting with [QR codes](#) (2-d bar codes) with my mobile phone. While helping my daughter assemble a Lego® spaceship, I had the random thought that maybe I could build a QR code out of Lego. Would such a QR code be readable, or would the bumps and gaps mess it up?

To find out, I generated a QR code and started assembling it out of my daughter's spare Lego pieces. This would have been much easier if she had a lot of small white pieces, so I needed to really dig to find the necessary 1x1 blocks. (I'm pretty sure that determining if a code can be tiled with a specific set of blocks is a NP-complete problem, but my manual heuristics were sufficient to get it assembled.)

The moment of truth... would it scan? No, not at all. The problem was I needed a border around the code block and I'd put the pieces too close to the edge. So I laboriously shifted all the pieces over and added a white border.



LEGO Star Wars
MagnaGuard Starfighte...
LEGO

Buy from amazon.com

Privacy Information

With the border, the QR code scanned amazingly well. Here's a camera-eye view. If you have a barcode-enabled phone, you can probably scan this off the screen:



You can create QR codes with existing materials, objects and building blocks...

Source: <http://www.arcfn.com/2009/01/qr-codes-in-lego.html>

QR Codes: not just printed paper

A QR CODE BUILT FROM EVERYDAY OBJECTS
THURSDAY 12.15.2011 , POSTED BY BENJAMIN STARR

SHARE: [Tweet](#) 25 [Like](#) 16 [+1](#) 4 [Pin it](#) [Submit](#)



QR codes seem to be cropping up everywhere you look, from tags in electronics stores to flyers stapled to telephone poles... so it's really nice to see this [completely original project](#) from David Sykes. To promote his newly launched website, Sykes created an 8 foot square model of a QR code using objects sourced directly from his studio. He then photographed the 'cityscape' of stuff from above and made 8x10 prints retaining the full frame of the shot. By including the studio floor and rebates in the image, he gave the whole piece a further sense of depth. Possibly my favorite aspect of the project was the mysterious way each print arrived at its recipient: in an anonymous photograph mailer with no mention of who it was from. Brilliant!

You can create QR codes with existing materials, objects and building blocks...

Source: <http://www.visualnews.com/2011/12/15/a-qr-code-built-from-everyday-objects/>

QR Codes: not just printed paper



You can create QR codes with existing materials, objects and building blocks...

Source: <http://www.elenabelmann.blogspot.com/2011/02/objekt-als-informationstrager.html>

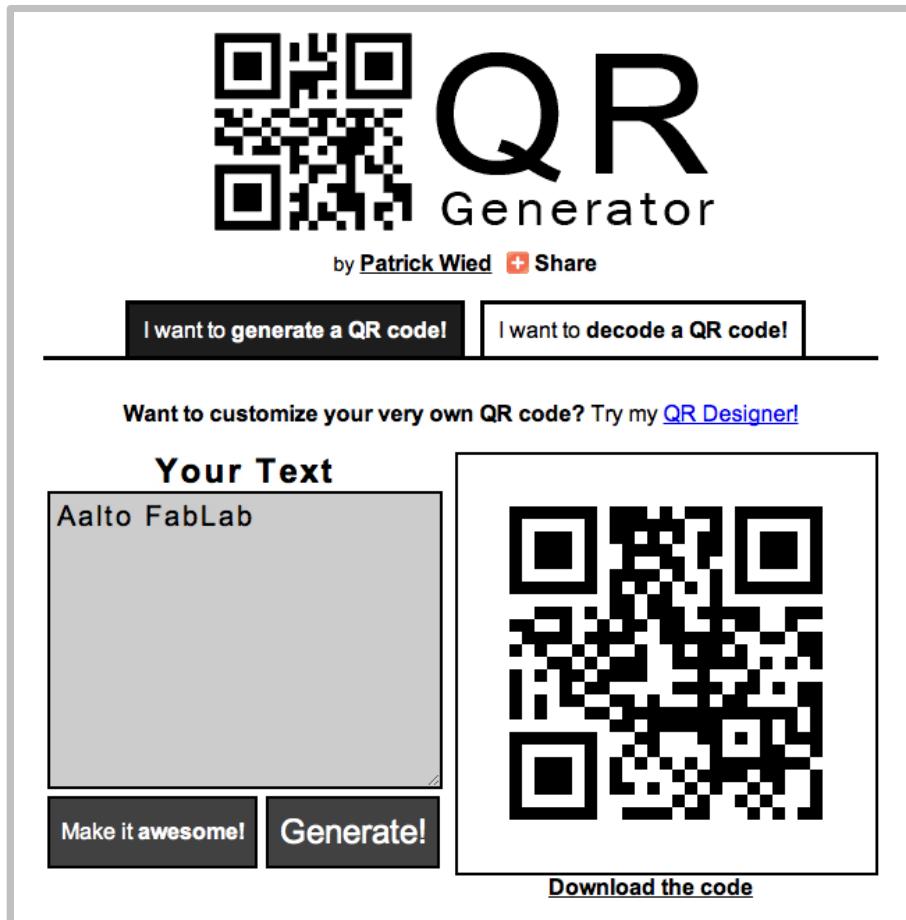
QR Codes: an easy way to create them

The screenshot shows a web-based tool for generating QR codes. At the top, there's a QR code icon and text explaining the service: "Create QR codes from different kinds of data, and download your code both in a rasterized (PNG) and vector format (PDF, SVG, EPS). Feedback/suggestions? Leave your message." Below this is a large, bold heading: "What do you want to turn into a QR code?". On the left, a vertical list of options includes "Regular text" (which is highlighted in a teal box), "Hyperlink", "Phone number", "Email address", "meCard", "vCard", and "WiFi settings". To the right of this list is a text input field for "Regular text" with the placeholder "Regular text will not be interpreted by most QR readers, so it will just be displayed as it is.". Below the input field is a "more options" button with a gear icon. At the bottom right is a prominent "CREATE" button. At the very bottom of the interface, there are social sharing links for "Like" (Facebook) and "Tweet" (Twitter).

Many online free services will create QR Codes for you starting from many different kinds of information.

Source: <http://qrcode.littleidiot.be/>

QR Codes: an easy way to create (and decode) them



Many online free services will create QR Codes for you starting from many different kinds of information.

Source: <http://www.patrick-wied.at/static/qrgen/>

QR Codes: an easy way to create them

The screenshot shows the homepage of QRStuff.com. At the top, there's a navigation bar with links for HOME, ABOUT THIS SITE, QR CODES, PHONE SOFTWARE, EXAMPLES, FAQS, and AFFILIATES. There are also social media links for Twitter, Facebook, and a BLOG. A login form with fields for Email and Password is visible, along with links for Register and Forgot Password?.

The main content area features a banner with links to Dynamic QR Codes, Vector Or Raster File Output, High Resolution Files, Analytics Reports, Error Correction Levels, Account History, and Batch Processing (up to 500 QR codes at a time). It also promotes a \$3.95 subscription.

The interface is divided into four main sections:

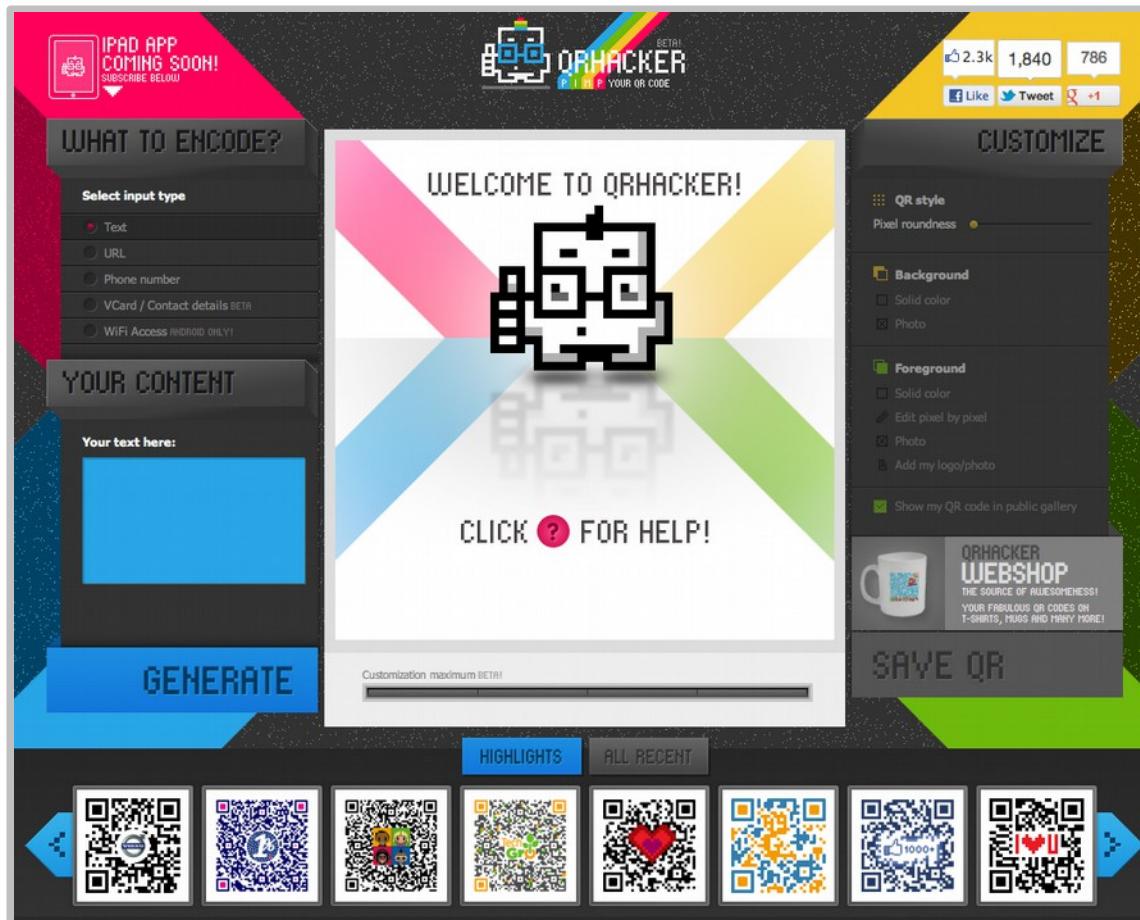
- 1 DATA TYPE:** A list of options including Website URL, YouTube Video, Google Maps Location, Twitter, Facebook, LinkedIn, Foursquare, iTunes Link, Plain Text, Telephone Number, Skype Call, SMS Message, Email Address, Email Message, Contact Details (VCARD), Event (VCALENDAR), Wifi Login (Android Only), and Paypal Buy Now Link. The "Website URL" option is selected.
- 2 CONTENT:** A field labeled "Website URL" containing "http://". Below it are two radio button options: "Embed URL into code as-is" (selected) and "Use our qrs.ly URL shortener". A note below says "Subscribers get analytics and dynamic QR code editing when using our URL shortener."
- 3 FOREGROUND COLOUR:** A color picker with a gradient from purple to red. A color hex code "000000" is shown next to it. A note below says "Subscribers can also specify image size and resolution, and choose from 6 raster or vector output file types and 4 error correction levels."
- 4 OUTPUT TYPE:** Buttons for DOWNLOAD, PRINT, EMAIL, and BATCH FILE UPLOAD. To the right, there's a section titled "PUT YOUR CODE ON OTHER STUFF" showing various examples like a t-shirt, a mug, and a bag with QR codes.

On the right side, there's a large preview of a QR code and a "DOWNLOAD QR CODE" button.

Many online free services will create QR Codes for you starting from many different kinds of information.

Source: <http://www.qrstuff.com/>

QR Codes: an easy way to create them



Many online free services will create QR Codes for you starting from many different kinds of information.

Source: <http://www.qrhacker.com/>

QR Codes: an easy way to create a stencil

The screenshot shows a web page from the Make: magazine website. The header features the 'Make:' logo with the tagline 'technology on your time'. Below the header are four navigation links: 'Blog' (green), 'MAKE Magazine' (red), 'Videos/Podcasts' (blue), and 'Make: Projects' (orange). The breadcrumb navigation indicates the page is under 'Home / Culture jamming / QR Stenciler'. The main title of the article is 'QR Stenciler'. To the left of the main content, there is a sidebar with text from Golan Levin at fffff.at and a QR code image. The main content area contains a photograph of a QR code stencil painted on a concrete surface. Below the image, there is a paragraph of text.

Golan
Levin at
fffff.at
writes:

Yep,
it's a
QR
code
stencil

generator! We present **QR_STENCILER**, a free, fully-automated utility which converts QR codes into vector-based stencil patterns suitable for laser-cutting. Additionally, we present **QR_HOBO_CODES**, a series of one hundred QR stencil designs which, covertly marked in urban spaces, may be used to warn people about danger or clue them into good situations. The QR_STENCILER and the QR_HOBO_CODES join the [Adjustable Pie Chart Stencil](#) in our suite of homebrew "infoviz graffiti" tools for locative and situated information display.

... and there are even libraries for creating stencil of QR Codes that you can laser cut!

Source: <http://blog.makezine.com/2011/07/20/qr-stenciler/>

QR Codes: you can track the position as well

springwise.com
YOUR ESSENTIAL FIX OF ENTREPRENEURIAL IDEAS

In Croatia, postage stamps made trackable via QR code

Croatia's Hrvatska Pošta has created postage stamps featuring QR codes that can be used to track mail and confirm delivery.

The image shows a collection of Croatian postage stamps on the left, each featuring a QR code and the text "TT379K" and "www.gimarks.posta.hr". To the right is a map of Central Europe, specifically focusing on Austria, Slovenia, Croatia, and Serbia. Numerous red and black circular markers are placed on the map, some containing letters like A or B, representing tracked locations.

1st November 2011 in Government.

As postal services around the globe struggle to keep up with the online era, we've already seen all-digital stamps rolled out in Denmark. Now it looks like Croatia's own Hrvatska Pošta has come up with a different solution: postage stamps featuring QR codes that can be used to track the mail and confirm delivery.

As you can link an identity to an object with a QR Code, then we can track where this identity moves.

Source: <http://www.springwise.com/government/croatia-postage-stamps-trackable-qr-code/>

QR Codes: you can add related information

springwise.com
YOUR ESSENTIAL FIX OF ENTREPRENEURIAL IDEAS

On cigarette packages, QR codes reveal a nearby place to smoke

Ronhill has begun to use QR codes on its cigarette packaging to help consumers find a nearby place to smoke.



8th September 2011 in Lifestyle & Leisure.

Just as today's prevalent smoking bans can lead to a lot of cigarette butts on the doorsteps of public places, so the increasingly smoke-free world can make it difficult for smokers to find a place to enjoy their habit. Enter Croatian cigarette brand Ronhill, which has begun to use QR codes on its packaging to help consumers find a nearby place to smoke.

You can provide related information and build apps and services around an object!

Source: http://www.springwise.com/lifestyle_leisure/cigarette-packages-qr-codes-reveal-nearby-place-smoke/

QR Codes: you can add related information

Steelcase

PRODUCTS SERVICES RESOURCES SHOP COMPANY

Leap: QR Codes

Overview Gallery Environmental Adjustability QR Codes

QR codes help users learn how to properly adjust the Leap chair.

To help users quickly find information on how to properly adjust their chairs to be more comfortable, Steelcase will be adding QR codes to the arms of its best selling ergonomic task chairs, such as Leap (available fall 2011).

How does the QR code work?

Once a user scans the QR code with a mobile device, they are taken to a mobile-friendly site that plays an interactive video showing chair adjustments.

The QR code connects users to information about their chair that is relevant to them:

- how to adjust the chair
- how to clean the chair
- how they can purchase a chair for their home office

Find a dealer near you.



You can provide the instruction manual of an object!

Source: <http://www.steelcase.com/en/products/category/seating/task/leap/pages/qr-codes.aspx>
<http://www.fastcodesign.com/1665090/an-office-chair-with-built-in-video-instruction-manual>

QR Codes: you can add the source code!

SUPERMECHANICAL objects that connect us

Objects Blog About



REV->TABLE

Products used to be less disposable; they came with repair manuals and a personal history. rev->table picks up where they left off.

This side table is built to last with quality components. And when those have outlived their useful life, the digital blueprint is a permanent part of rev->table. Use your smartphone to read the digital design file embedded in each part and create replacements. Modify the legs to make them longer or angled or art deco. This is furniture for the future of manufacturing.

Solid oak, powder-coated steel, laser-etched aluminum. Crafted in the United States using the best of traditional and digital construction.

21"H x 16"W x 16"L; 10.5 lbs.

 Tweet

... and finally you can even provide directly the source code of an object, not just a link to its source online!

Source: <http://supermechanical.com/rev/>

http://www.springwise.com/style_design/future-repairs-tables-digital-blueprints-etched-surface/

QR Codes: you can add the source code!

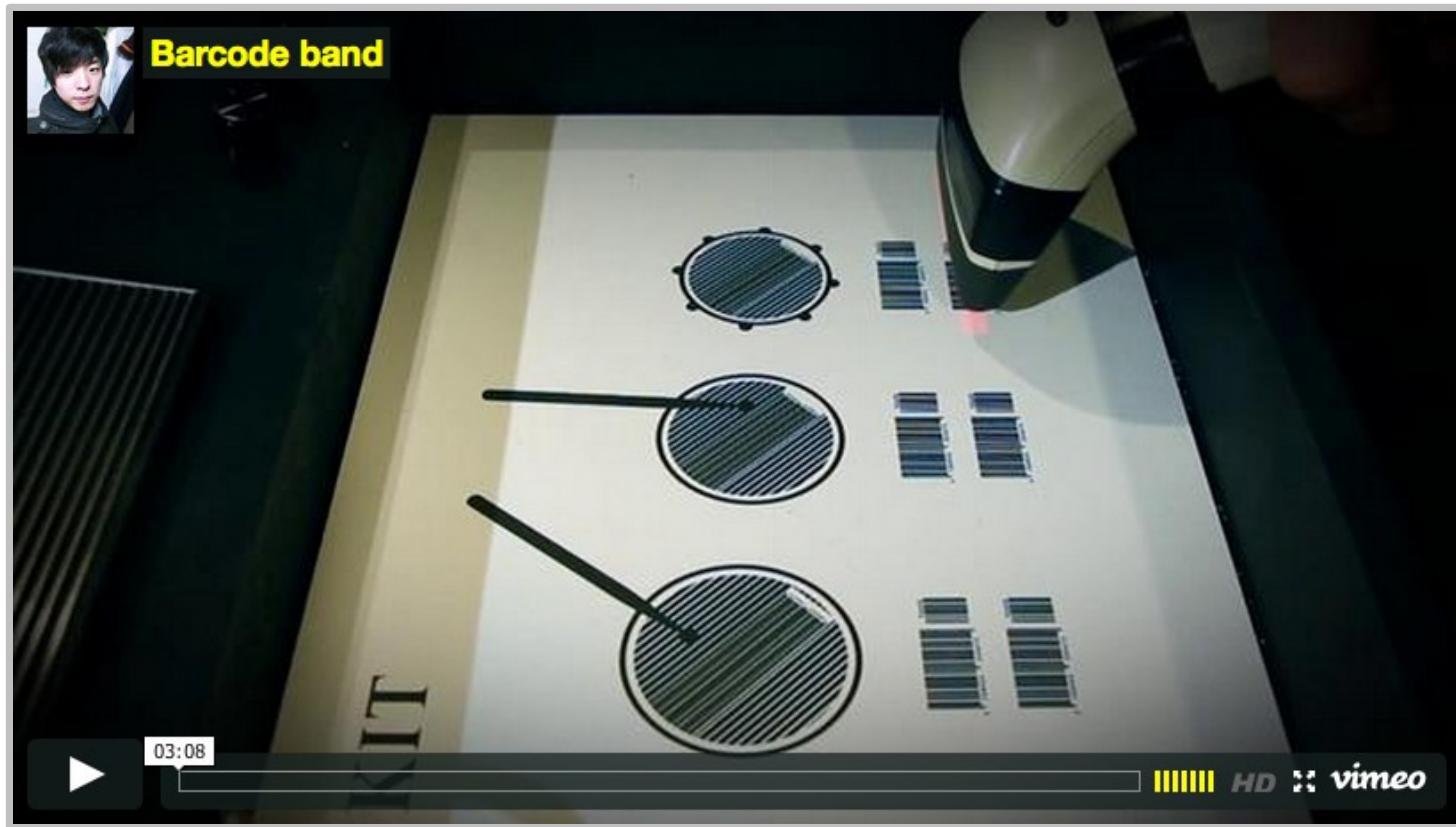


... and finally you can even provide directly the source code of an object, not just a link to its source online!

Source: <http://supermechanical.com/rev/>

http://www.springwise.com/style_design/future-repairs-tables-digital-blueprints-etched-surface/

Bar Codes: retrieving information through design!



... you can even use codes and existing objects to design a new system based on retrieving information!

Source: <http://www.designboom.com/weblog/cat/16/view/22271/barcode-band-scans-its-way-to-new-music.html>
<http://vimeo.com/41132461>

QR Codes: which bits?

PCWorld » Security

Recommend: 0 Comments Print

Beware of Malicious QR Codes

By Hamish Barwick, Computerworld-Australia

Cyber criminals have taken advantage of the proliferation of quick response (QR) codes on posters and marketing material by putting their own malicious stickers over the top of legitimate ones, warns security vendor AVG Australia and New Zealand.

QR codes can be read by scanning the sticker or typing in the code using a smartphone with a QR code reader.

In its latest report, entitled AVG Community Powered Threat Q4 2011, the company warns that cyber criminals are now producing their own QR codes which contain text and URLs with hidden malware. For example, one piece of malware called 'JimmRussia' sends costly SMS messages to premium numbers and also redirects to a URL which downloads a malicious file.

AVG Technologies chief technology officer, Yuval Ben-Itzhak, said in a statement that the smartphone user does not know what lurks behind the code until the malware is installed and running. "Putting a malicious QR code sticker onto existing marketing material or replacing a website's bona fide QR code with a malicious one could be enough to trick many unsuspecting people," he said.



We are embedding information on an object, and we use a device for retrieving it... but which kind of information?

Source: http://www.pcworld.com/article/248843/beware_of_malicious_qr_codes.html

Virus: a dangerous information



Some kind of information (like viruses) can modify, deform and damage an object...

Source: <http://www.platform21.nl/page/3915/en>
<http://www.nextnature.net/2009/04/ikea-lamp-ca...>

Sound: a dangerous information



Some kind of information (like sound) can modify, deform and damage an object...

Source: <http://www.dezeen.com/2012/07/13/noize-chairs-by-estudio-guto-requena/>
<http://vimeo.com/45568573>

QR Code: you can even print it (in 3D)

The screenshot shows a Thingiverse page for a "Data Matrix Dualstrusionator". The main image is a photograph of a 3D printed QR code mounted on a yellow base plate, with a 3D printer's extruder arm positioned above it. Below the image are several smaller preview images of the QR code from different angles.

Data Matrix Dualstrusionator

Created by **tbuser** on Oct 1, 2011
Derived from [OpenSCAD Bitmap Fonts Module](#) by [tbuser](#)

This script lets you create a positive/negative Data Matrix[1] Bar Code suitable for feeding into your experimental dual extruders. Or if you just want a negative space object barcode to cut into another model.

You can encode the whole thingiverse url in your barcode, but the result will be pretty big. Probably too large to stamp into another model. However, you can just encode the Thingiverse thing number to get a pretty small code!

1: en.wikipedia.org/wiki/Data_Matrix

Downloads

Sort By	Date	Popular	File Type
	datamatrix dua...scad	2 kb / 33 downloads	7 months ago
	datamatrix duals...rb	924 b / 34 downloads	7 months ago
	number a.stl	114 kb / 39 downloads	7 months ago

Instructions

Install OpenSCAD, download my OpenSCAD bitmap library, and make sure you have Ruby on your system. Then run gem install semacode. Now you can edit the variables in datamatrix_dualstrusionator.scad and .rb and run the .rb script. It will shell out to OpenSCAD and generate an a.stl and a b.stl. You'll probably get the best results if you print it vertically. Note: the bigger the string, the painfully longer it takes. OpenSCAD is slow. :(

Comments

[Leave a comment](#)

Latest From The Thingiverse Blog

You Know You're Onto Something...

...when you're having electron microscopes take the final photos of your 3D prints. This car is a little under 300 microns long, or just about the right size to sit inside the more fine-pitch extruder nozzle tips you can get these days for your thermoplastic printers. Atoms are the

If you have a 3D printer that can print at least two different materials....

Source: <http://www.thingiverse.com/thing:12104>

QR Code: for real walls

QR code stickers turn real-world objects into digital conversations

QRawr enables users to transform physical objects into Facebook-style walls, with QR code stickers containing text and photo messages.



19th January 2012 in **Lifestyle & Leisure**.

We've seen QR codes being used to convey playful messages before when we covered [Qkies](#) cookies. Now San Diego-based [QRawr](#) is giving users the ability to transform any physical object into a Facebook-style digital wall, with QR code stickers linking to the users' own photos, videos or text.

QRawr hope their stickers, printed with unique QR codes, will turn real-world items into online conversations. Users must first download the QRawr iOS app to create their own message on the QR code stickers. QRawr encourage users to be creative, suggesting the stickers could be left in restaurants linking to photos of ordered meals, or at the end of a hiking trail with a message for others who complete the trek. Spotters of QRawr stickers can scan them — once they've downloaded the app — and post comments, pictures and videos in response. QRawr have built the initial version of the iPhone app and are seeking funding via [Kickstarter](#) to create an Android version and add features such as geolocation.

QRawr's founders believe the entertainment potential of QR codes has to-date been neglected. If you agree, this could this be an opportunity for you.

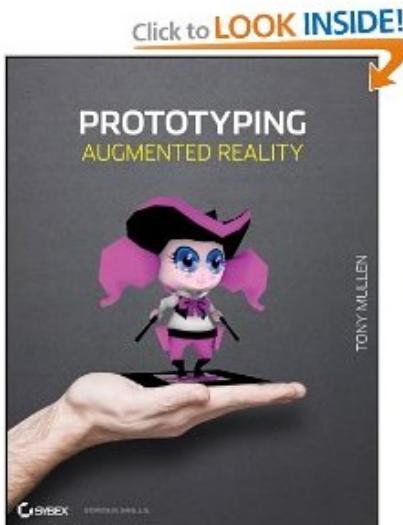
Website: www.qrawr.com

Contact: team@qrawr.com

Not only Dead Drops can be used for embedding information on a wall!

Source: http://www.springwise.com/lifestyle_leisure/qr-code-stickers-turn-real-world-objects-digital-conversations/
<https://qrawr.com/>

After QR Code, Augmented Reality?



Prototyping Augmented Reality [Paperback]

Tony Mullen (Author)

★★★★★ (1 customer review) | Like (2)

List Price: \$39.99

Price: **\$21.96** & eligible for **FREE Super Saver Shipping** on orders over \$25. [Details](#)

You Save: \$18.03 (45%)

[Special Offers Available](#)

In Stock.

Ships from and sold by **Amazon.com**. Gift-wrap available.

Only 3 left in stock--order soon (more on the way).

[32 new](#) from \$17.97 [13 used](#) from \$17.95



FREE Two-Day Shipping for students on millions of items. [Learn more](#)

[Share your own customer images](#)

Publisher: [learn how customers can search inside this book.](#)

Formats	Amazon Price	New from	Used from
Kindle Edition	\$25.00	--	--
Paperback	\$21.96	\$17.97	\$17.95

AR can be useful for adding a layer of bits on a space or object, and we can possibly think about its source code...

Source: <http://amzn.to/KUwNk6>

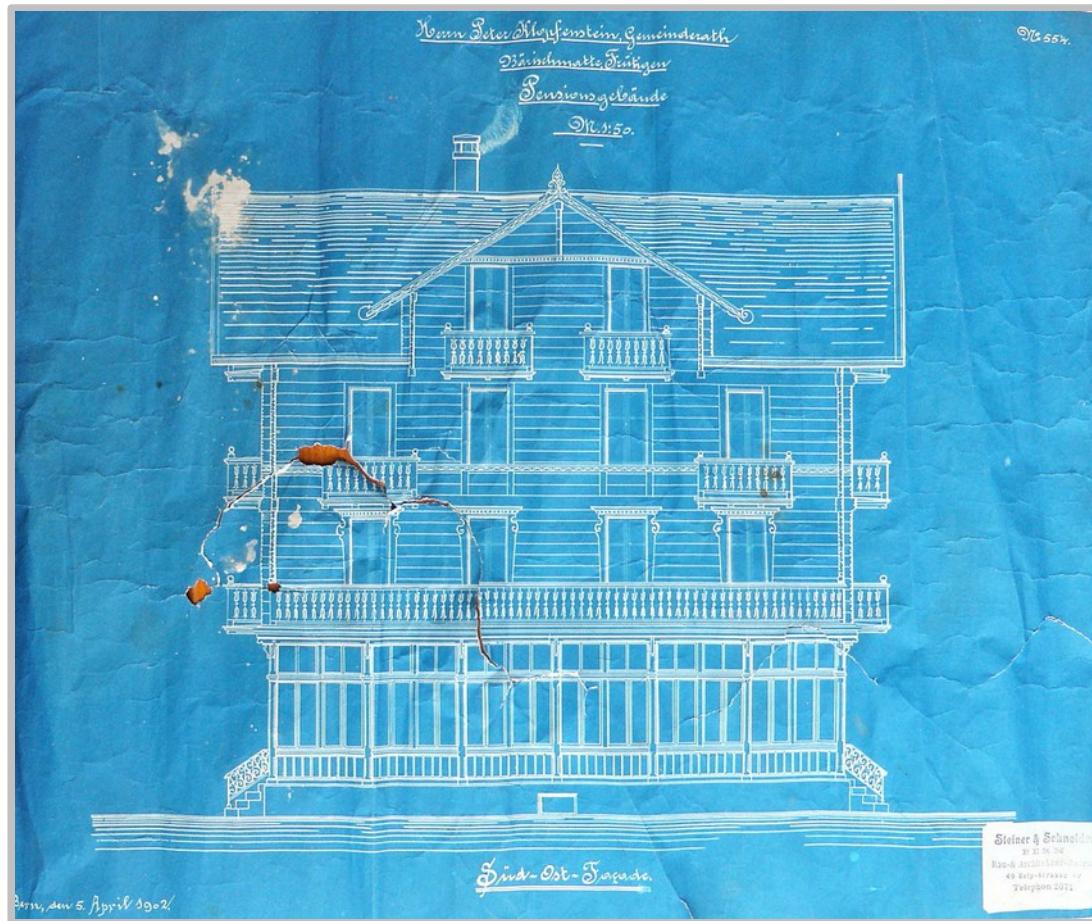


Aalto University
Media Factory

04.

Blueprints – suggestions for the documentation of the projects

Ok, the blueprints...



We need all the possible documentation for being able to replicate the project in other FabLabs.

Source: <http://commons.wikimedia.org/wiki/Category:Blueprints>

Patents (?)

Google 3d printing Massimo Merichinelli 1 + Share

Patents

Result 1 of 6 in this book for 3d printing - < Previous Next > - View all

Apparatus and methods for 3D printing
David Russell et al.

Overview
Abstract
Drawings
Description
Claims
0

3d printing Go

Patent number: 7291002
Filing date: Apr 2, 2004
Issue date: Nov 6, 2007
Application number: 10/817,159

(12) United States Patent
Russell et al.

(10) Patent No.: US 7,291,002 B2
(45) Date of Patent: Nov. 6, 2007

(54) APPARATUS AND METHODS FOR 3D PRINTING

(75) Inventors: David Russell, Burlington, MA (US); Andres Hernandez, Malden, MA (US); Joshua Kinsley, Arlington, MA (US); Andrew Berlin, Gloucester, MA (US)

(73) Assignee: Z Corporation, Burlington, MA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 422 days.

(21) Appl. No.: 10/817,159
(22) Filed: Apr. 2, 2004
(65) Prior Publication Data
US 2004/0265413 A1 Dec. 30, 2004

Related U.S. Application Data
(60) Provisional application No. 60/472,922, filed on May 23, 2003.

(51) Int. Cl.
B28B 13/02 (2006.01)
(52) U.S. Cl. 425/447; 425/375; 425/744;
264/308; 700/119
(58) Field of Classification Search
425/375, 425/744, 264/308, 401; 700/119, 120
See application file for complete search history.

(56) References Cited
U.S. PATENT DOCUMENTS

4,247,508 A 1/1981 Housholder
4,251,325 A 2/1981 Foykin
4,752,352 A 6/1988 Feygin
4,853,717 A 8/1989 Harmon et al.
4,863,538 A 9/1989 Deckard
4,872,026 A 10/1989 Rasmussen et al.
4,929,402 A 5/1990 Bill
4,938,816 A 7/1990 Beaman et al.

(10) Patent No.: US 7,291,002 B2
(45) Date of Patent: Nov. 6, 2007

4,994,817 A 7/1990 Bourell et al.
4,996,010 A 2/1991 Motrek
5,017,751 A 5/1991 Deckard
5,027,134 A 6/1991 Harmon et al.
5,053,090 A 10/1991 Beaman et al.
5,076,869 A 12/1991 Bourell et al.
5,103,244 A 4/1992 Gase et al.
5,115,250 A 5/1992 Harmon et al.

(Continued)

FOREIGN PATENT DOCUMENTS
DE 29907362 * 8/1999

(Continued)

OTHER PUBLICATIONS
Evaluation of the Advanced Ceramics Market for New Applications of Three Dimensional Printing, M.S. Thesis, MIT 1995.

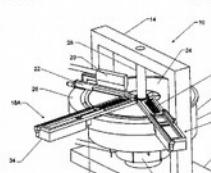
(Continued)

Primary Examiner: Robert Davis
Assistant Examiner: Maria Veronica Ewald
(74) Attorney, Agent, or Firm: Goodwin Procter LLP

(57) ABSTRACT

The invention relates to apparatus and methods for producing three-dimensional objects and auxiliary systems used in conjunction with the apparatus and methods. The apparatus and methods involve extruding material, printing radially about a circular and/or rotating build table using multiple printheads. The apparatus and methods also include optionally using multiple build tables. The auxiliary systems relate to build material supply, printhead cleaning diagnostics, and monitoring operation of the apparatus.

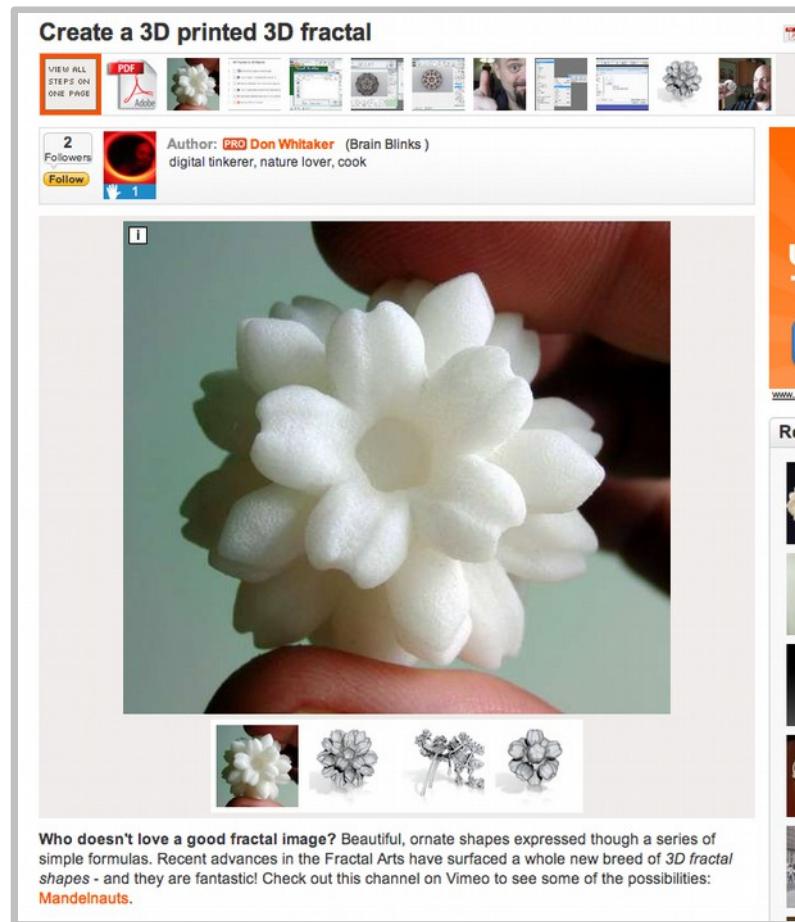
26 Claims, 19 Drawing Sheets



A very formal way of representing a project, but it could be useful.

Source: <http://bit.ly/K3YgxN>

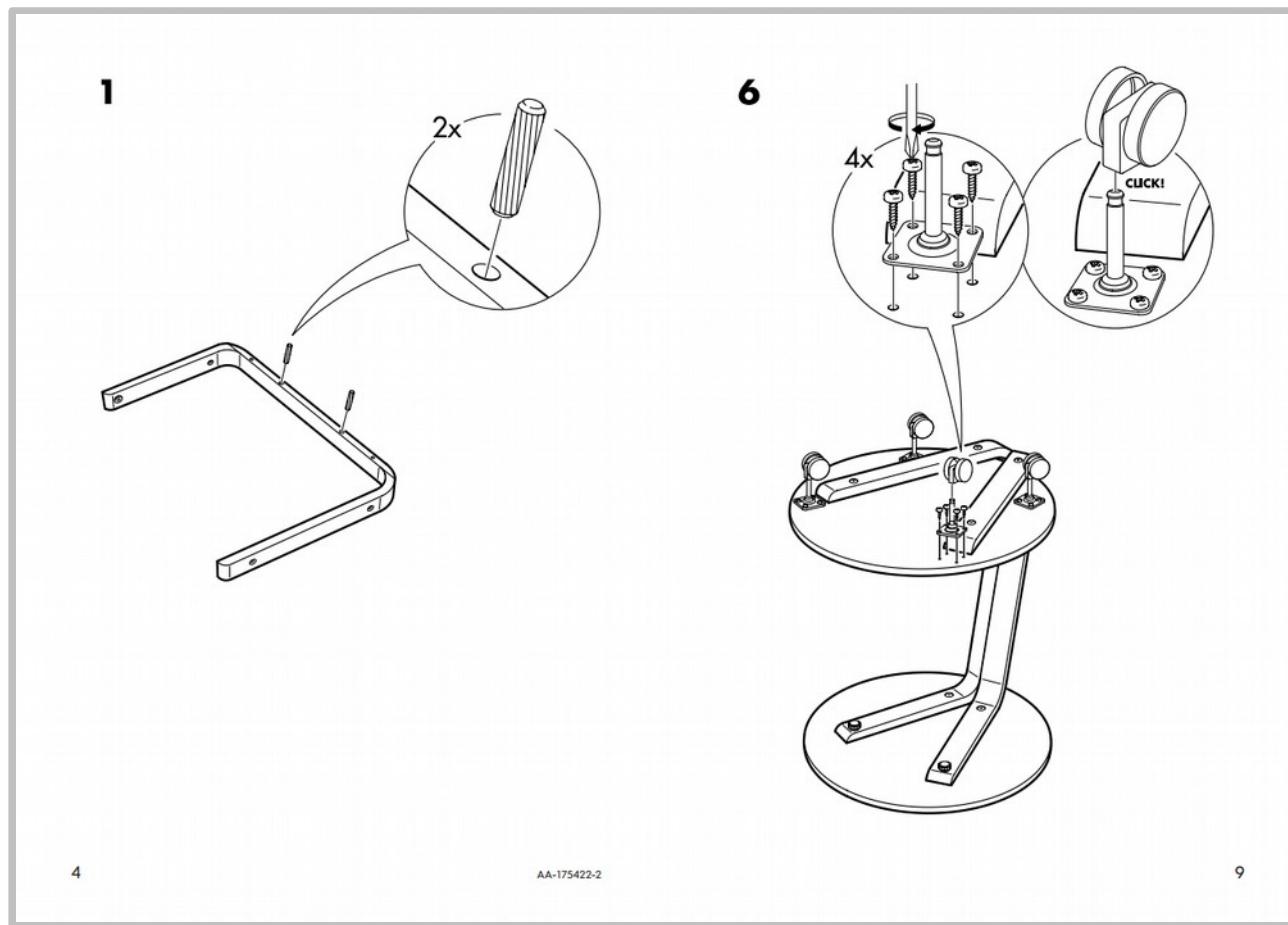
Instructions (process): Instructables.com



You can explain in a simple way the whole process...

Source: <http://www.instructables.com/id/Create-a-3D-printed-3D-fractal/?ALLSTEPS>

Instructions (process): IKEA



You can provide simple instructions...

Instructions (process) for dummies: IKEA



... simple instructions that can be understood by any culture!

Even videos...



Nowadays it is almost impossible to find a tutorial that it is not made with a video! Even researchers present their papers with a video.

Source: <http://youtu.be/dfNByi-rr04>



Aalto University
Media Factory

Thank you!!

Massimo Menichinelli
Aalto Media Factory
massimo.menichinelli@aalto.fi
[@openp2pdesign](https://twitter.com/openp2pdesign)
<http://www.slideshare.net/openp2pdesign>

