

Versionshantering och git

Kai-Mikael Jää-Aro

Versionskontroll

Mjukvaruutveckling är inte en linjär process från en tom fil till n rader korrekt fungerande kod.

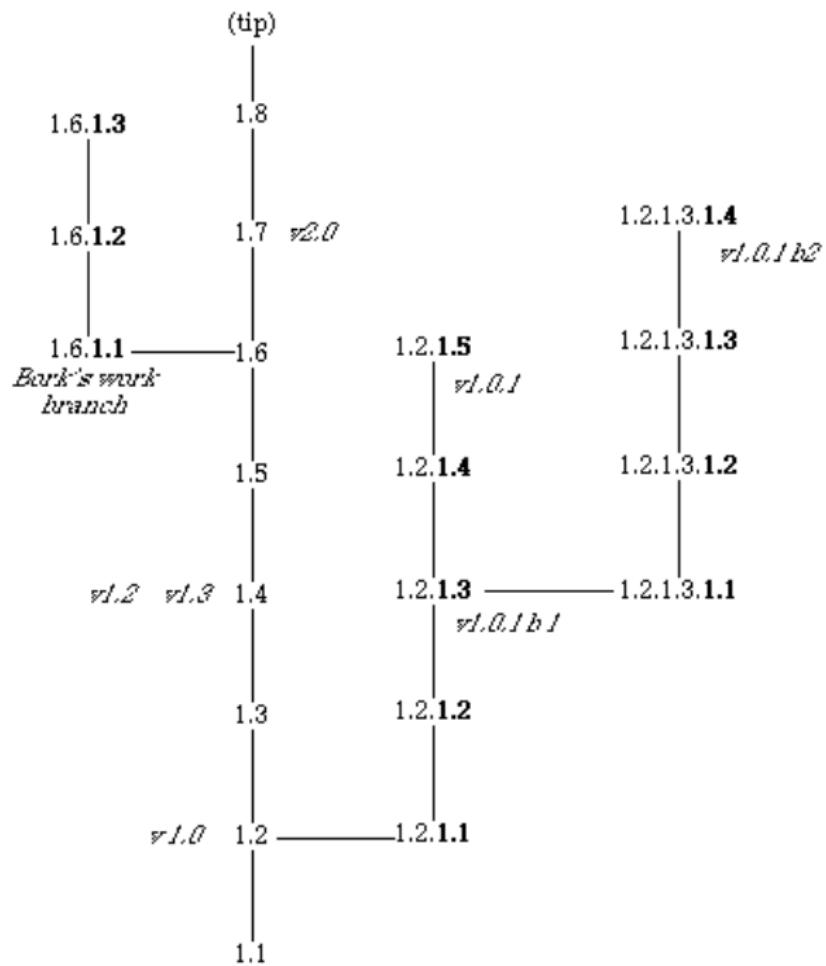
- ▶ Fel införs under arbetets gång.
- ▶ Vi provar alternativa lösningar.
- ▶ Flera parallella versioner krävs.

Därför måste vi:

- ▶ kunna återgå till en fungerande version av mjukvaran,
- ▶ arbeta med en av flera möjliga versioner.

Versionskontroll

- ▶ Ett arkiv.
- ▶ *Incheckning* av kod (*revisioner*) i arkivet.
- ▶ Hämta ut tidigare incheckningar.
- ▶ Trädstruktur för parallella versioner. (“tip”/“trunk”/“master” är huvudspåret.)
- ▶ Ändringar i parallella versioner kan föras tillbaka till master.
- ▶ Varje revision har en identitet, kan markeras med en *tag* som motsvarar släppt version eller annan milsten.



Parallel utveckling

Flera utvecklare i samma projekt.

1. Checka ut aktuell version av koden.
2. Koda, testa.
3. Checka in *stabil* kod.
4. Hantera ev konflikter.
5. Repetera tills projektet klart.

Git

Det finns ett stort antal versionshanteringssystem, här kommer vi att gå igenom git.

git är ett *distribuerat* versionskontrollsysteem. Man lagrar *alla* utvecklare en (komprimerad) kopia av hela databasen, men normalt utser man ett specifikt arkiv till att vara "origin", till vilket alla kopierar sitt material och som alla hämtar ifrån.

Dock är man inte beroende av det centrala arkivet utan kan arbeta offline med sin kopia tills man får kontakt med arkivet igen.

Att använda git

Grunden för git är ett kommandoradsgränssnitt, men det finns flera olika grafiska gränssnitt.

GitHub (<https://github.com/>) gör tillgängligt både ett webbgränssnitt till git och gratis server-utrymme för open source-projekt.

Att skapa ett arkiv

A screenshot of a Firefox browser window showing the GitHub sign-up page. The URL in the address bar is <https://github.com>. The page features a dark background with a grid of white GitHub icons. In the center, the text "Build software better, together." is displayed above a form for creating a new account. The form includes fields for "Pick a username", "Your email", and "Create a password", followed by a green "Sign up for GitHub" button. Below the button, a small note states: "By clicking \"Sign up for GitHub\", you agree to our terms of service and privacy policy. We will send you account related emails occasionally." At the bottom of the page, there's a section about GitHub Enterprise with a "Tell me more" button.

Build software better, together.

Pick a username

Your email

Create a password

Sign up for GitHub

By clicking "Sign up for GitHub", you agree to our terms of service and privacy policy. We will send you account related emails occasionally.

Introducing a faster, more flexible GitHub Enterprise.

Now available on AWS.

Tell me more

A screenshot of a Firefox browser window. The title bar displays "GitHub - Build software better...". The address bar shows "GitHub, Inc. [JS] https://github.com/join/plan". The main content area is titled "Welcome to GitHub" and says "You've taken your first step into a larger world, @kaimikael.". It features three steps: "Completed Set up a personal account", "Step 2: Choose your plan" (which is currently selected), and "Step 3: Go to your dashboard". Below this, there's a section titled "Choose your personal plan" with a table of plans: Large (\$50/month, 50 repos, "Choose" button), Medium (\$22/month, 20 repos, "Choose" button), Small (\$12/month, 10 repos, "Choose" button), Micro (\$7/month, 5 repos, "Choose" button), and Free (\$0/month, 0 repos, "Chosen" button). To the right, a box lists "Each plan includes:" with items like "Unlimited collaborators", "Unlimited public repositories", "Free setup", "SSL Protection", "Email support", and "Wikis, Issues, Pages, & more". At the bottom, there's a note about charges being in US Dollars and a checkbox for "Help me set up an organization next".

Welcome to GitHub

You've taken your first step into a larger world, **@kaimikael**.

Completed
Set up a personal account

Step 2:
Choose your plan

Step 3:
Go to your dashboard

Choose your personal plan

| Plan | Cost <small>(View in SEK)</small> | Private repos | Action |
|--------|-----------------------------------|---------------|-------------------------|
| Large | \$50/month | 50 | <button>Choose</button> |
| Medium | \$22/month | 20 | <button>Choose</button> |
| Small | \$12/month | 10 | <button>Choose</button> |
| Micro | \$7/month | 5 | <button>Choose</button> |
| Free | \$0/month | 0 | <button>Chosen</button> |

Each plan includes:

- ✓ Unlimited collaborators
- ✓ Unlimited public repositories
- ✓ Free setup
- ✓ SSL Protection
- ✓ Email support
- ✓ Wikis, Issues, Pages, & more

Charges to your account will be made in US Dollars. Converted prices are provided as a convenience and are only an estimate based on current exchange rates. Local prices will change as the exchange rate fluctuates.

Don't worry, you can cancel or upgrade at any time.

Help me set up an organization next

Organizations are separate from personal accounts and are best suited for

A screenshot of a Firefox browser window displaying the GitHub homepage. The address bar shows "GitHub" and the URL "https://github.com". The top navigation bar includes links for "Work admin", "Teaching", "Research", "Manuals", "Software", "Daily", and "Most Visited". The main header features a search bar, a user profile icon for "kaimikael", and navigation links for "Explore", "Gist", "Blog", and "Help".

[kaimikael](#) [Search GitHub](#) [Explore](#) [Gist](#) [Blog](#) [Help](#) [kaimikael](#) [+ New repository](#) [Pull Requests](#) [Issues](#)

Learn Git and GitHub without any code!

Using the Hello World guide, you'll create a repository, start a branch, write comments, and open a pull request.

[Let's get started!](#)



Welcome to GitHub! What's next? (a minute ago)

- [Create a repository](#)
- [Tell us about yourself!](#)
- [Browse interesting repositories](#)
- [Follow @github on Twitter](#)

ProTip! Edit your feed by updating the users you [follow](#) and repositories you [watch](#).

Your repositories [+ New repository](#)

You don't have any repositories yet!
Create your first repository or learn more about
Git and GitHub.

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Create a New Repository

GitHub, Inc. [URl] https://github.com/new

Work admin ~ Teaching ~ Research ~ Manuals ~ Software ~ Daily ~ Most Visited ~

Search GitHub

Explore Gist Blog Help

kaimikael

Owner Repository name
kaimikael / demo_rep

Great repository names are short and memorable. Need inspiration? How about [glowing-octo-cyril](#).

Description (optional)
Demonstration repository

Public Anyone can see this repository. You choose who can commit.

Private You choose who can see and commit to this repository.

Initialize this repository with a README This will let you immediately clone the repository to your computer. Skip this step if you're importing an existing repository.

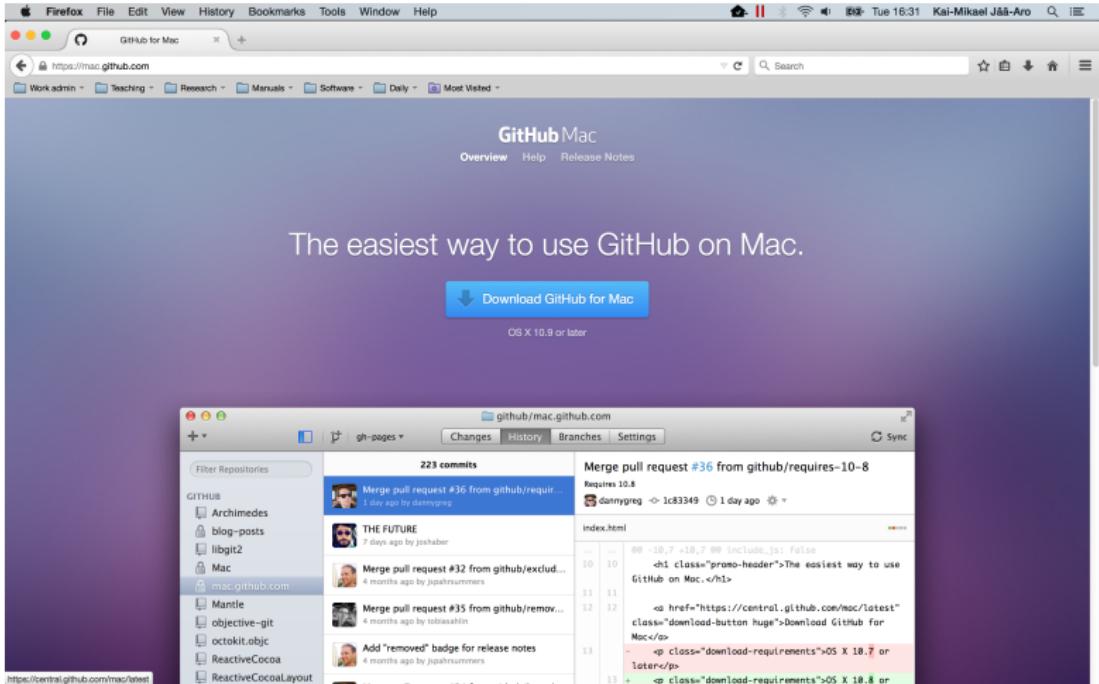
Add .gitignore: Unity ▾ Add a license: None ▾

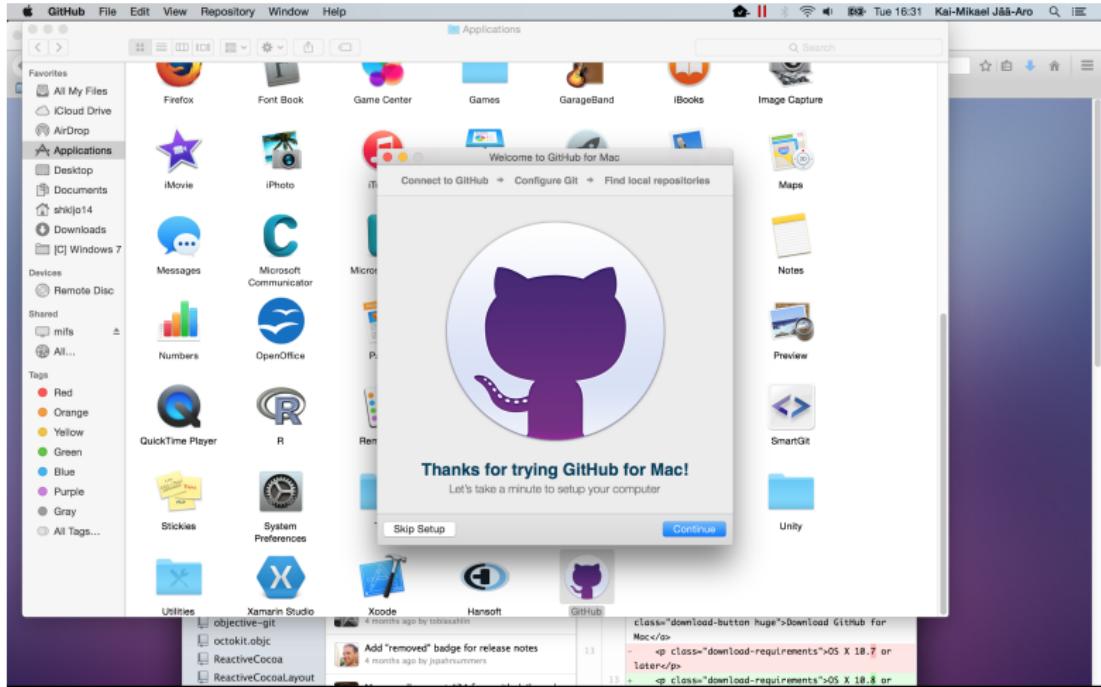
Create repository

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GitHub File Edit View Repository Window Help

tmp — bash — 124x51

```
serialisedread.cs:8:1: unexpected token: public
```

US

US Amigo, Alberto Carlsson, Robert Hillberg, Rasmus L
US Ankarberg, Victor Ek, Anton Jeppson, Per N
US Bohman, Niclas Forsblom, André Larsson, Jonathan S

```
++ kaislmbpro:HT2014 shklj045 mv ~/Downloads/Alberto_Amigo_Jonathan_Larsson_C_Uppsats_Forsblom_Andre_Norberg_Andreas.pdf kaislmbpro:HT2014 shklj045 mv ~/Downloads/Bohman_Stinson_C_Uppsats_Final_
```

```
kaislmbpro:HT2014 shklj045 ls -l Amigo,\ Alberto/
```

```
total 4824
```

```
-rwxr--r-- 1 shklj04 KTD\Domain Users 866866 Jan 19 14:16 Alberto_Amigo_Jonathan_Larsson_C_Uppsats_Forsblom_Andre_Norberg_Andreas.pdf
```

```
-rw-r--r-- 1 shklj04 KTD\Domain Users 738754 Dec 16 10:12 Alberto_Amigo_Jonathan_Larsson_C_Uppsats_Forsblom_Andre_Norberg_Andreas.pdf
```

```
-rw-r--r-- 1 shklj04 KTD\Domain Users 866866 Jan 19 14:05 eris kaislmbpro:HT2014 shklj045 rm Amigo,\ Alberto/original\Alberto_Forsblom_Amigo_Jonathan_Larsson_C_Uppsats_Forsblom_Andre_Norberg_Andreas.pdf
```

```
C-uptsats_SP12_Andre_Forsblom_Andreas_Norberg.pdf original\ C-uptsats_SP12_Andre_Forsblom_Andreas_Norberg.pdf
```

```
kaislmbpro:HT2014 shklj045 ls -l Forsblom,\ Andre/
```

```
total 4768
```

```
-rwxr--r-- 1 shklj04 KTD\Domain Users 744580 Dec 16 10:13 C-Upsats_Forsblom_Amigo_Jonathan_Larsson_C_Uppsats_Forsblom_Andre_Norberg.pdf
```

```
-rw-r--r-- 1 shklj04 KTD\Domain Users 845747 Jan 19 14:16 C-Upsats_Forsblom_Amigo_Jonathan_Larsson_C_Uppsats_Forsblom_Andre_Norberg.pdf
```

```
-rw-r--r-- 1 shklj04 KTD\Domain Users 845747 Jan 19 14:05 eris kaislmbpro:HT2014 shklj045 rm Forsblom,\ Andre/original\C-Uppsats_Forsblom_Amigo_Jonathan_Larsson_C_Uppsats_Forsblom_Andre_Norberg.pdf
```

```
Bohman_Stinson_C_Uppsats_Final_draft.pdf original\ Bohman_Stinson_C_Uppsats_Final_draft.pdf
```

US Bohman, Stinson_Doppening_Draft_C_Uppsats.pdf

US Bohman, Stinson_Handout_C_Uppsats.pdf

US Bohman, Stinson_Handout_C_Uppsats.pdf

US Bohman, Stinson_Handout_C_Uppsats.pdf

US Bohman, Stinson_Handout_C_Uppsats.pdf

ME total 14594

```
-rw-r--r-- 1 shklj04 KTD\Domain Users 2498051 Jan 19 14:16 Bohman_Stinson_Handout_C_Uppsats.pdf
```

```
-rw-r--r-- 1 shklj04 KTD\Domain Users 2442805 Jan 19 14:16 Bohman_Stinson_Handout_C_Uppsats.pdf
```

```
-rw-r--r-- 1 shklj04 KTD\Domain Users 2442805 Jan 19 14:05 eris
```

IN kaislmbpro:HT2014 shklj045 rm Stinson,\ Kimberly/original\Bohemian_Kaisla

IN kaislmbpro:HT2014 shklj045 rm Bohman,\ Niclas\Bohman_Stinson_C_Uppsats_Final_Draft.pdf

IF Alberto,Amigo,_Jonathan,Larsson,Fun with Death and Failure.pdf Alberto_Amigo_Jonathan_Larsson_Oppenning_CSA.pdf

IN kaislmbpro:HT2014 shklj045 open Bohman,\ Niclas\Bohman_Stinson_C_Uppsats_Final_Draft.pdf Amigo,\ Alberto/Alberto_Amigo_Jonathan_Larsson_Fun_with_Death_and_Failure.pdf Forsblom,\ Andre/C

IN _Fun_,with,_Death,_and,_Failure.pdf Forsblom,\ Andre/C

EL C-Uppsats_Forsblom,Andre,Norberg,Andreas.pdf C-uptsats_SP12_Andre_Forsblom_Andreas_Norberg.pdf

IN kaislmbpro:HT2014 shklj045 open Bohman,\ Niclas\Bohman_Stinson_C_Uppsats_Final_Draft.pdf Amigo,\ Alberto/Alberto_Amigo_Jonathan_Larsson_Fun_,with,_Death,_and,_Failure.pdf Forsblom,\ Andre/C

IF _Fun_,with,_Death,_and,_Failure.pdf Forsblom,\ Andre/C

IN kaislmbpro:HT2014 shklj045 less ~/Downloads/work/dr/tex

RJ _DS_Store dr-abs-sv.tex dr-spik-en-tex dr.pdf kth-abs.tex parallel/ titleref.sty

CU changebar/ dr-biblio dr-spik-kv.pdf dr.ps.gz kth-biblio.tex picby x.pdf

CU dr-cite.pdf dr-cite-sv.tex dr.toc kth-cite.tex tocout.tex x.tex

KB docs/ dr-prev-tex dr_abs dr_toc kth-spik.tex test.pdf

dr-abs-en.tex dr-spik-en.pdf dr.blg fancyvrb/ latediff.pl test.tex

LB kaislmbpro:HT2014 shklj045 less ~/Downloads/work/dr/dr.tex

IN kaislmbpro:HT2014 shklj045

Last login: Tue Jan 20 15:00:10 on ttys004

shklj045 []

GitHub.com Login

 kaimikael

Sign Out

GitHub Enterprise Login

If you have a GitHub Enterprise account, add your login here to have access to your repositories.

Add an Enterprise Account

Find out more about GitHub Enterprise

Skip Setup Continue

SmartGit

Unity

Download GitHub for Mac

Add "removed" badge for release notes

4 months ago by jpalmerjunes

- <p class="download-requirements">OS X 10.7 or later</p>

+ <p class="download-requirements">OS X 10.8 or

The screenshot shows a Mac OS X desktop with several windows open. In the foreground, a terminal window titled 'tmp - bash - 124x51' displays a command-line session for a file named 'serialisedread.csv'. The session includes a 'git pull' command followed by a series of 'shklj014' commands, which appear to be part of a script or a series of manual edits. The terminal also shows the user's path as 'tmp - bash - 106x34'. In the background, there are two other GitHub-related windows: one titled 'GitHub for Mac' showing a list of repositories and another titled 'GitHub for Mac' showing a list of commits for a repository named 'Kai-Mikael Jää-Aro'. The GitHub for Mac windows have dropdown menus for 'Connect to GitHub', 'Configure Git', and 'Find local repositories'. The commit list includes entries from users like 'Alberto' and 'Bohan, Niclas', with commit messages such as 'Fun with Death and Failure.pdf' and 'Oppenning_CSA.pdf'. The overall environment suggests a developer's workspace.

GitHub File Edit View Repository Window Help

tmp — bash — 124x51

```
serialisedread.cs:8:1: unexpected token: public
          } do
          {
            pile = r.Next(0, piles.Length);
          } while (piles[pile] == 0);
          sticks = r.Next(1, piles[pile] + 1);
        }
      }
    }
  }
}

Welcome to GitHub for Mac
```

tmp — bash — 106x34

```
serialisedread.cs:8:1: unexpected token: public
          } do
          {
            pile = r.Next(0, piles.Length);
          } while (piles[pile] == 0);
          sticks = r.Next(1, piles[pile] + 1);
        }
      }
    }
  }
}

Welcome to GitHub for Mac
```

Connect to GitHub + Configure Git + Find local repositories

Which repositories would you like to use?

You can always add more later

- Githost** → Desktop/Githost
- githost-admin** → git-repository-admin
- NimDemo** → Teach/Common/NimDemo
- Arbeitsintervju** → Teach/V1148MEHT2015/Assignments/Arbeitsintervju
- Nim** → Teach/V1148MEHT2015/Assignments/Nim

ME total: 14594

```
-rw-r--r-- 1 shklijol4 KTD\Domain Users 2498051 Jan 19 14:16 Bot
ID -rw-r--r-- 1 shklijol4 KTD\Domain Users 2442805 Jan 19 14:12 Bot
ID -rw-r--r-- 1 shklijol4 KTD\Domain Users 2442805 Jan 19 14:12 Bot
IN kaismpro:HT2014 shklijol45 rm Stinson,\ Kimberly\original1;Bohman,Stinson,C
kaismpro:HT2014 shklijol45 open Bohman,\ Niclas\Bohman,Stinson,C
IF Alberto,Amigo,_Jonathan,Larsson,Fun with Death and Failure.pdf Alt
IN kaismpro:HT2014 shklijol45 open Bohman,\ Niclas\Bohman,Stinson,C
IN _Fun_with_Death_and_Failure.pdf Forsblom,\ Andre\C
EL C-Uppsets_Forsblom,Andre,Norberg,Andreas,.pdf →C-Uppsets_SP12
IN kaismpro:HT2014 shklijol45 open Bohman,\ Niclas\Bohman,Stinson,C
IF _Fun_with_Dead_and_Failed_Forsblom,\ Andre\Uppsets_SP12
kaismpro:HT2014 shklijol45 less >Downloads/work/dr/dr.tex
RJ _DS_Store dr-abs-sv.tex dr-spik-en.tex dr.pdf kt
CU changebar/ dr-biblio/ dr-spik-kv.pdf dr.ps.gz kt
WV dr-ps.pdf dr-psv/ dr-spik-sv.tex kt
KA docs/ dr-prev.tex dr_abs dr_toc kth-spik.tex test.pdf kt
dr-abs-en.tex dr-spik-en.pdf dr_blg fancyvrb/ latexdiff.pl test.tex kt
LA kaismpro:HT2014 shklijol45 less >Downloads/work/dr/dr.tex
KA kaismpro:HT2014 shklijol45
```

Last login: Tue Jan 20 15:00:10 on ttys004

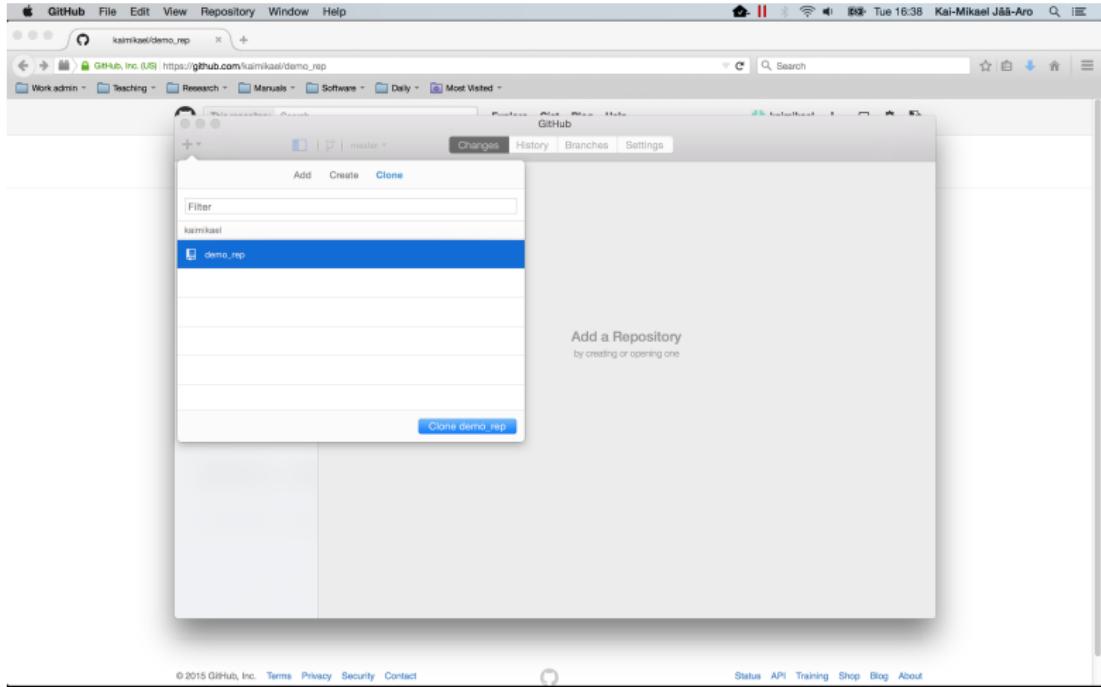
kaismpro:HT2014 shklijol45

Add "removed" badge for release notes
4 months ago by jpaluszakmirek

class="download-button nudge">Download GitHub for Mac

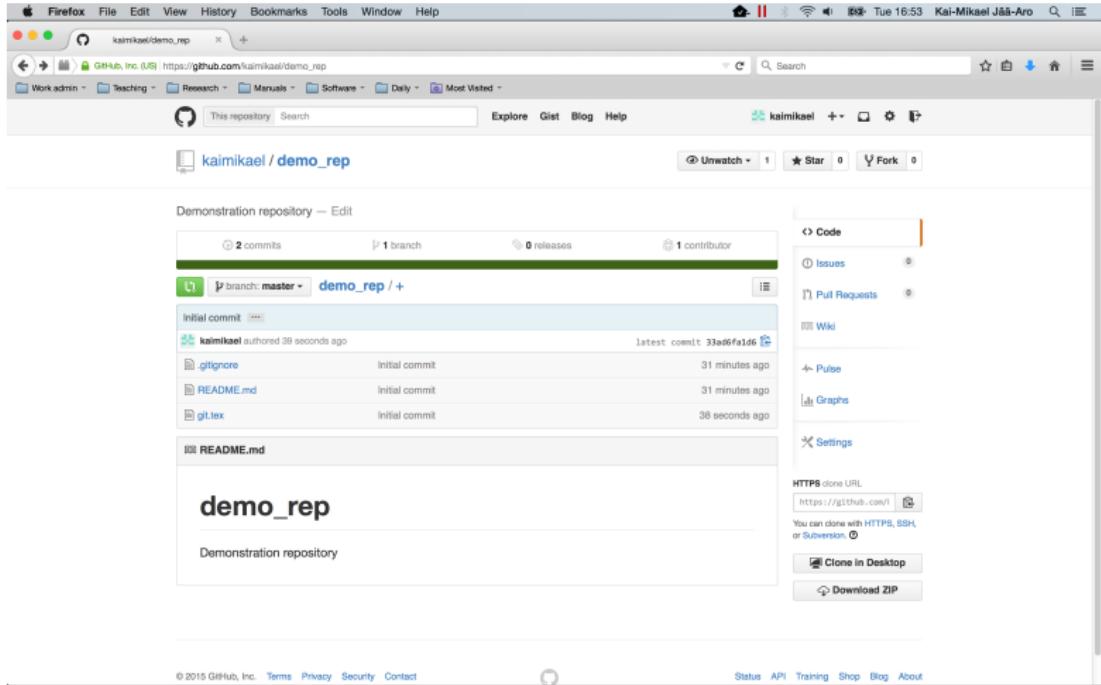
- xp class="download-requirements">OS X 10.7 or later

+ cp class="download-requirements">OS X 10.8 or



A screenshot of a GitHub commit interface on a Mac OS X desktop. The window title is "GitHub - kalmikael/demo_rep". The main pane shows an "Initial commit" message: "On the importance of version control and how to use git-hut with special application to Unity developers." Below the message, there is a "Select All" checkbox followed by a "NEW" button and a file path "→/Presentations/Global Game Jam 2015/demo_rep". A large green rectangular highlight covers the commit message area and the "git.tex" code editor on the right. The code editor contains the following LaTeX code:

```
git.tex
1 + \documentclass[swedish]{beamer}
2 + \usepackage{pgfpages}
3 + \usepackage{mystides}
4 + \usepackage{fancyvrb}
5 + \usepackage{lighttt}[lmodern]
6 + \usepackage{menukeys}
7 + \listset{language=bash}
8 +
9 + \maketitle
10 + \AtBeginDocument{%
11 +   @ifpackageloaded{fancyvrb}{}{\let
12 +     @space@fancyvrb@catcodes@relax%
13 +   }%
14 + }
15 + \def@space@fancyvrb@catcodes{%
16 +   \relax\@V@CommandChars
17 + }%
18 + \expandafter
19 +   @space@fancyvrb@catcodes@aux
20 +   \FV@CommandChars
21 + }%
22 + \def@space@fancyvrb@catcodes@aux
23 +   \catcode`#1=\relax\catcode`#2=1\relax
```



GitHub File Edit View Repository Window Help

serialisedread.cs:8:1: unexpected token: public

```

US kaismpro@HT2014 shk|j014 mv ~/Downloads/Alberto_Ami
US kaismpro@HT2014 shk|j014 mv ~/Downloads/C-uppsats_Sif
US kaismpro@HT2014 shk|j014 mv ~/Downloads/Boman_Stin
** kaismpro@HT2014 shk|j014 ls -l Amigo,,\ Alberto/
drwxr-xr-x 1 shk|j014 1K 0
-rw-r--r-- 1 shk|j014 1K 0
-rw-r--r-- 1 shk|j014 1K 0
-rw-r--r-- 1 shk|j014 1K 0
kaismpro@HT2014 shk|j014 1
C-uppsats_Forsablon_Andre_Nor
C-uppsats_SP12_Anderd_Forsbl
kaismpro@HT2014 shk|j014 1 GitHub
total 4788
-rw-r--r-- 1 shk|j014 1K 0
-rw-r--r-- 1 shk|j014 1K 0
-rw-r--r-- 1 shk|j014 1K 0
kaismpro@HT2014 shk|j014 1
kaismpro@HT2014 shk|j014 1
Boman_Stinson_C_Uppsats_Fir
Boman_Stinson_Oppenning_Dv
kaismpro@HT2014 shk|j014 1
KM_Ixarix-ixarix_1 shk|j014 1K 0
US kaismpro@HT2014 shk|j014 1
total 14584
CL_rw-r--r-- 1 shk|j014 1K 0
-rw-r--r-- 1 shk|j014 1K 0
ME_rw-r--r-- 1 shk|j014 1K 0
LJ_kaismpro@HT2014 shk|j014 1
kaismpro@HT2014 shk|j014 1
FO_kaismpro@HT2014 shk|j014 1
IN_Alberto_Amigo_Jonathan_Lars
kaismpro@HT2014 shk|j014 1
DE_Fun_with_Death_and_Fail
kaismpro@HT2014 shk|j014 1
IN_kaismpro@HT2014 shk|j014 1
IN_Fun_with_Death_and_Fail
EL_kaismpro@HT2014 shk|j014 1
IM_Ds_Store_drmv_tx
IF_drmv_tx/dr-bibli.tex
chap7.pdf
dr-old.tex
RJ_docs/dr-prev.tex
CL_dr-abs-en.tex/dr-spik-eng
kaismpro@HT2014 shk|j014 1
KA_kaismpro@HT2014 shk|j014 1
[Restored]
LA_Last login: Tue Jan 29 15:28
KA_kaismpro@HT2014 shk|j014 1
kaismpro@HT2014 shk|j014 1
kaismpro@HT2014 shk|j014 1
kaismpro@HT2014 shk|j014 1

```

git.txt

Changes History Branches Settings

Commits to master

Uncommitted Changes Commit

Description

Select All

git.txt

→ /Presentations/Global Game Jam 2015/demo_rep

No unsynced commits

git.txt

@@ -49,-7 +49,7 @@
 49 49 \end{Verbatim}
 50 50 }
 51 51 }
 52 -\title{Versionshantering med git}
 52 +\title{Versionshantering och git}
 53 53 \author{Kai-Mikael Jää-Aro}
 54 54 \date{}
 55 55 -->
 56 56 @@ -63,18 +63,11 @@
 63 63 \end{frame}
 64 64
 65 65 \begin{frame}
 66 -\frametitle{Versionshantering för Unity}
 66 +\frametitle{Versionskontroll}
 67 +Mjukvarutveckling är inte en linjär
 67 +process från en tom fil till (\n) rader
 67 +korrekt fungerande kod.
 68 \begin{itemize}
 68 -\item Enligt tidigare: Versionshantering
 68 -viktigt
 69 -\item Unity Asset Server kräver Unity Pro
 69 -\item Asset Server hanterar inte
 70 -\verb|\mph| (branching) och \verb|\mph| (rollback)
 71 -\item Alltså: hitta ett annat system
 72 -\item git populärt och modernt med önskade
 72 +funktioner

Quit

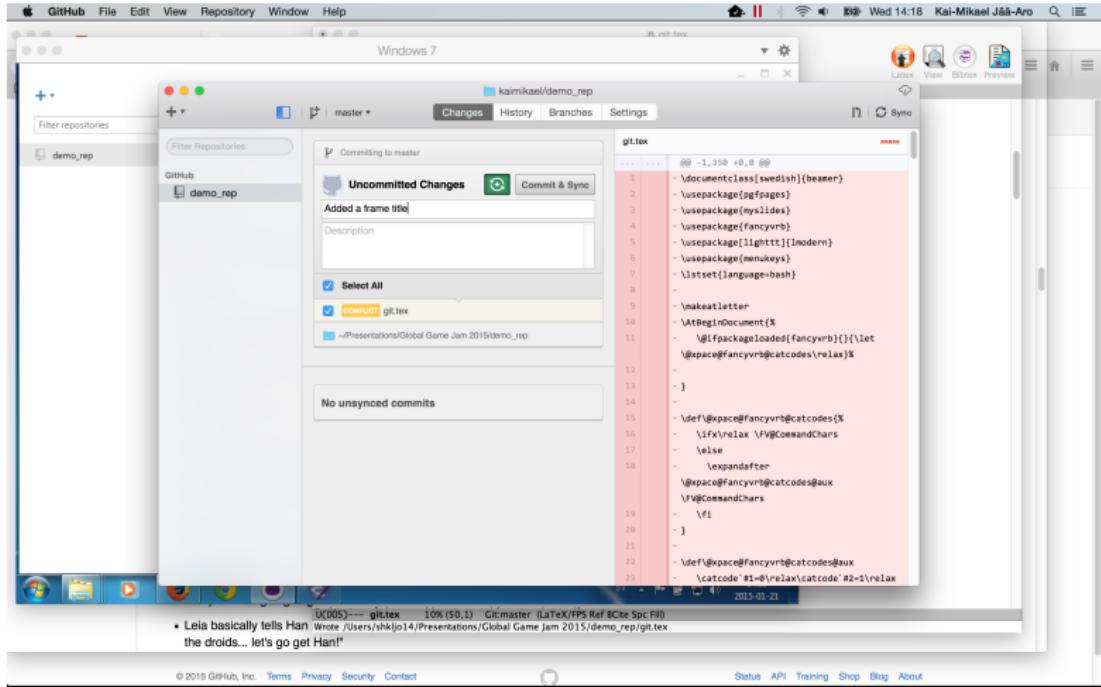
GitHub Help Privacy Terms of Use About

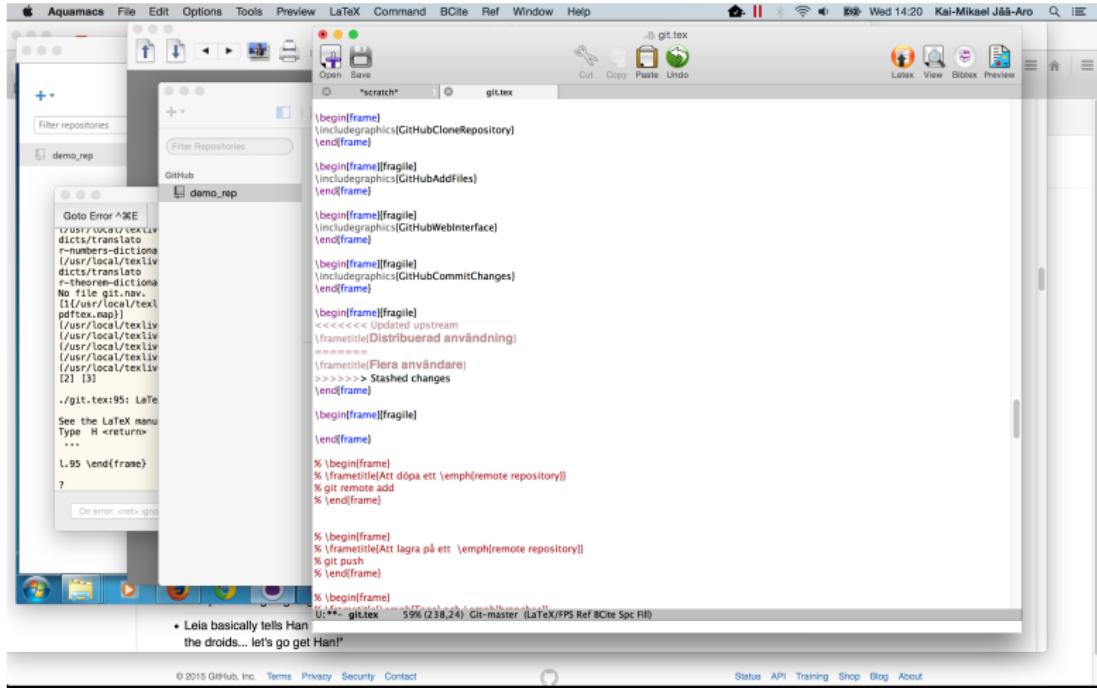
Distribuerad användning

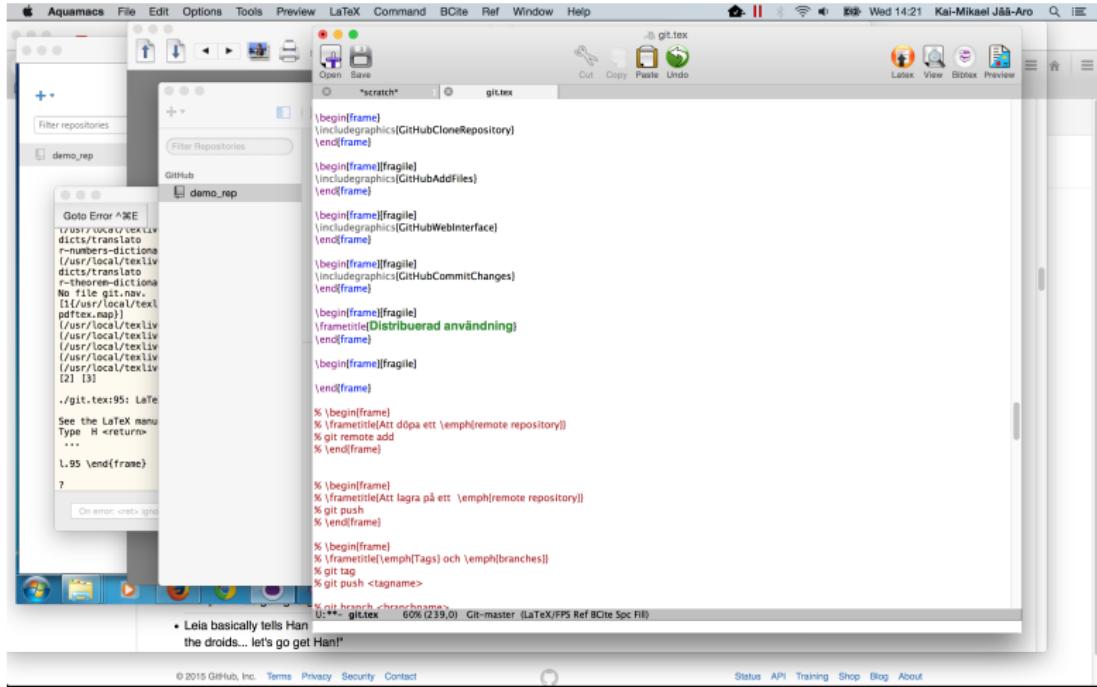
A screenshot of a Firefox browser window displaying a GitHub repository settings page. The URL in the address bar is https://github.com/kaimikael/demo_rep/settings/collaboration. The browser's top navigation bar includes File, Edit, View, History, Bookmarks, Tools, Window, Help, and a search bar. The GitHub header features a user icon, the repository name 'kaimikael / demo_rep', and links for Explore, Gist, Blog, and Help.

The main content area shows the 'Collaborators' section. A sidebar on the left contains 'Options' with tabs for 'Collaborators' (which is active), 'Webhooks & Services', and 'Deploy keys'. The 'Collaborators' section displays a message: 'This repository currently has no collaborators.' Below this is a list containing the entry 'kaimikael2'. To the right of the list is a button labeled 'Add collaborator'. The right side of the interface features a vertical sidebar with icons for code comparison, issues, pull requests, and other repository management functions.

At the bottom of the page, footer links include © 2015 GitHub, Inc. Terms, Privacy, Security, Contact, Status, API, Training, Shop, Blog, and About. The bottom navigation bar of the browser includes standard icons for back, forward, and search.







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Versionshanteringssystemet förstår bara koden som en sträng text.
Överlappande ändringar i samma kod flaggas, men om någon
skulle ändra funktionshuvudet till
public void func1(int par1, int par2) invalideras alla anrop till
func1, men versionshanteringssystemet ser inte detta.

Därför bör alla incheckningar följas av ett *bygge*.

Att ha en privat utvecklingsgren

Ett vanligt arbetsflöde är att man har en *master branch*, där koden är garanterad att vara stabil och körbar. Olika utvecklare kan sedan lätt skapa en egen gren att koda och testa i. Om något blir fel kan man alltid backa i denna gren och hålla mastern stabil. Man kan självfallet göra ytterligare grenar för olika tester.

git-arkiven är uppbyggda så att de låter oss arbeta på vilken punkt i trädet vi vill. Man kan se det som att man har en pekare in i trädet som pekar ut den aktuella uppsättningen filer som vi arbetar på. Vid behov kan vi flytta pekaren från en annanstans och arbeta där istället.

Merge

När man har en utvecklingsversion man är nöjd med är det dags att koppla ihop den med mastern.

merge av binära filer

git klarar inte (idag) av att göra merge på binära filer – m a o texturer, animationer, o dyl. Somliga installationer kan ha en mergetool som kan hjälpa till, men i allmänhet måste man manuellt hämta de binära filer man vill ha.

Mer läsning

Pro Git, 2nd Edition, Scott Chacon & Ben Straub.