

Software Engineering intro + Git basics

CS-214 - 10 Sept 2024
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Clément Pit-Claudel

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(Systèmes et Formalismes)

Joined EPFL in Jan 2023

**Please give feedback on
lectures and course
content!**

Announcements

Recursion exercises

Out since Monday!

Lab 1

Out in 1h

... but start with exercises!

Git exercises

Out by next Monday

Lab 0

Welcome poll

Due in two days

Exam date: 30.10 or 06.11?

Let's vote!

Today's lecture

- Intro
- A word about SE
- What is a software engineer?
- Git 1
 - What is a VCS?
 - How do I use git?
 - Demo

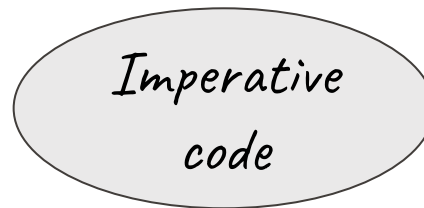
Why do we teach you Software Engineering?

EPFL

- 1. Profound understanding*
- 2. Deep expertise*
- 3. Adaptability*
- 4. Familiarity*

Topic 1: Functional programming

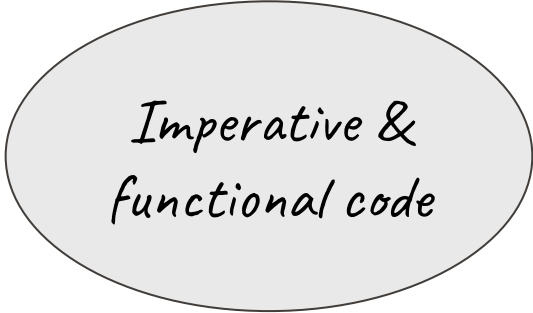
A deeper understanding of software construction



*Imperative
code*

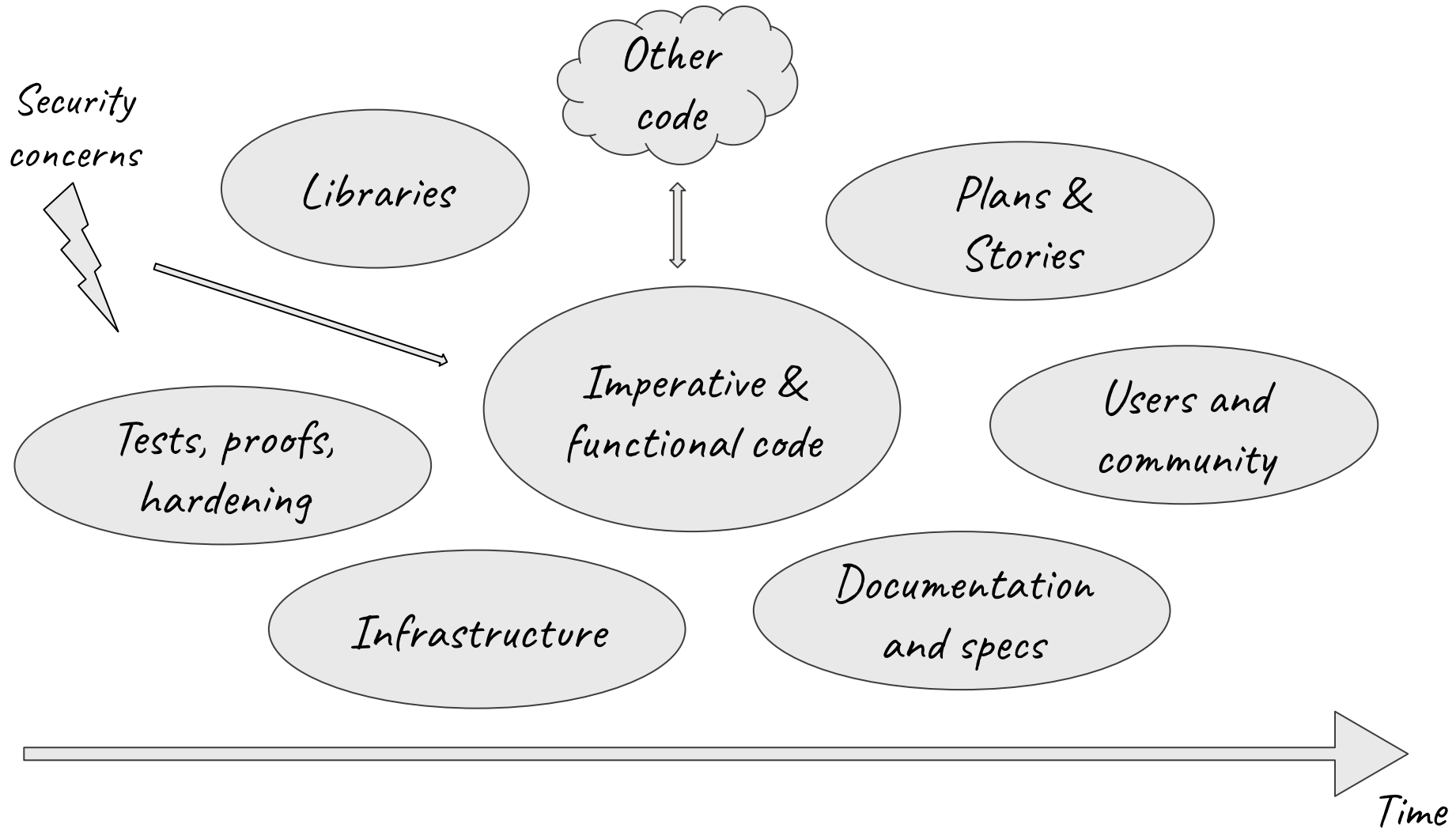
Topic 1: Functional programming

A deeper understanding of software construction



*Imperative &
functional code*

Topic 2: Software engineering: A broader understanding of Software Construction



9/9

0800 Antan started
 1000 " stopped - antan ✓
 1300 (032) MP - MC ~~1.982647000~~
 (033) PRO 2 2.130476415 (2) 4.615925059(-2)

convd 2.130676415

Relays 6-2 in 033 failed special speed test
 in relay " 10.00 test.

Relay
 2145
 Relay 3370

1100 Started Cosine Tape (Sine check)
 1525 Started Multi-Adder Test.

1545



Relay #70 Panel F
 (moth) in relay.

First actual case of bug being found.

1630 Antan started.
 1700 closed down.

<https://education.nationalgeographic.org/resource/worlds-first-computer-bug/>

The plan for CS-214 / SE

Make you (better) software
engineers

Show you how to figure things
out

Versioning and collaboration

3 lectures, starting today!

Writing correct code

4 lectures

Building apps from scratch

3 lectures

+ unguided lab & callback

Refactoring & code evolution

Labs + exercises

How do you protect yourself against data loss?



Activity: take a second to think about how you've used these tools, or similar tools, to collaborate on code.

What were the issues? Did it work?

The problems with backups

- No meaningful changesets
- Too-large or too-small granularity
- Limited history browsing capabilities
- Limited support for asynchronous collaboration

The solution? Use a VCS!

Version Control Systems (VCSs), or Source Code Management systems (SCMs) are for:

- Tracking the evolution of text or code ← today
- Versioning, distributed development ← next time

But not directly for:

- Bug tracking, code review, ← next year
- Testing, CI, deployment ← mostly next year

Git ≠ Github / Gitlab

What about software?



git



mercurial



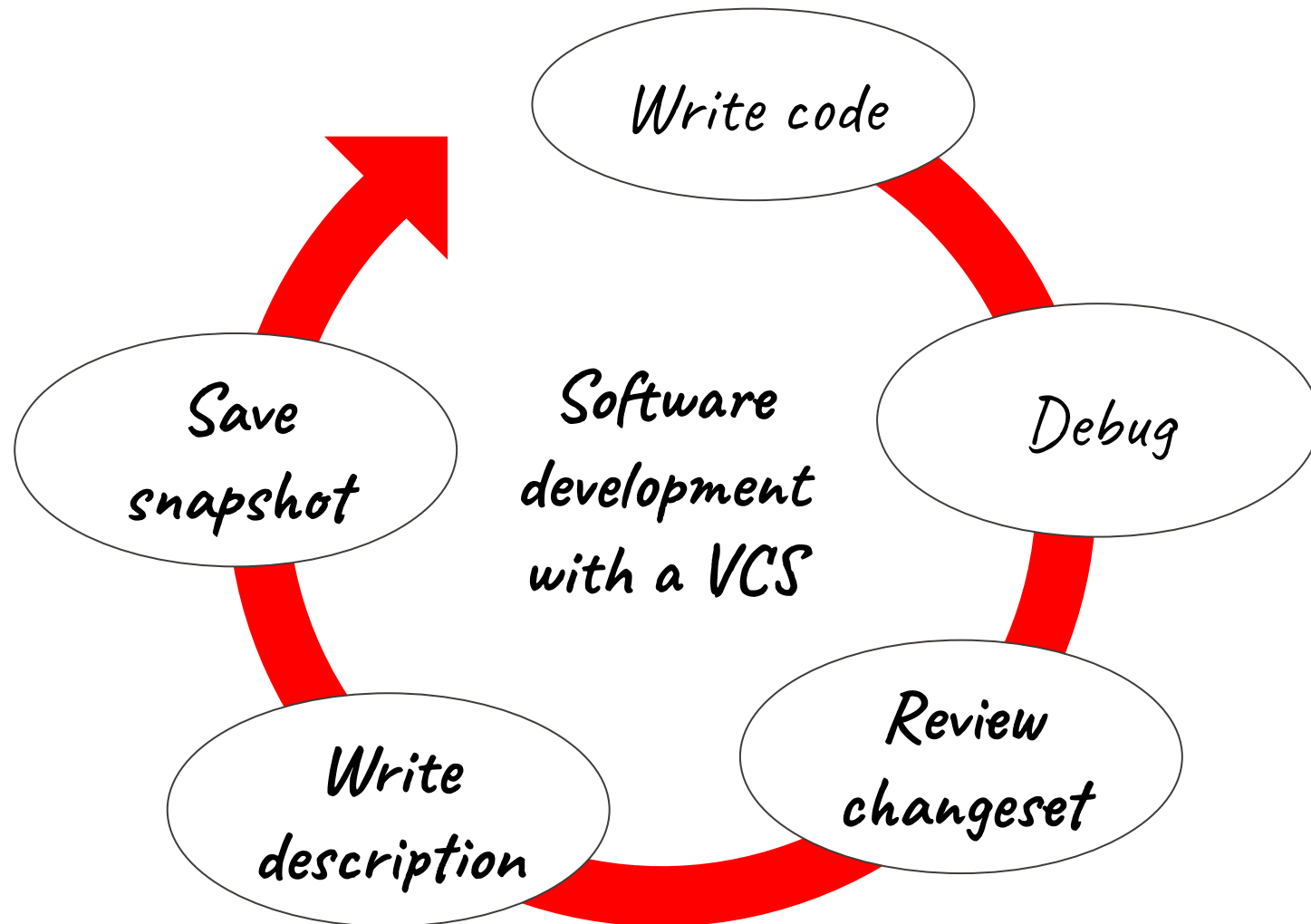
darcs

CVS



Exercise: Read about the history of version control systems!

Version control is **distributed**, labeled backups



alectryon: All files - gitk

File Edit View Help

● readme: Add a Gallery section with links to	Clément Pit-Claudel	2021-03-24 22:04:01
● readme: Explain how to include custom JS o	Clément Pit-Claudel	2021-03-24 21:40:28
● recipes: Rebuild output	Clément Pit-Claudel	2021-03-15 20:52:23
● js: Add support for Cmd/% on Mac	Jade Philipoom <jad	2021-03-15 17:39:33
● html: Remove mention of panels in HTML head	Clément Pit-Claudel	2021-03-15 20:36:35
● docutils: Set syntax_highlight and math_out	Clément Pit-Claudel	2021-03-15 20:34:36
● cli, docutils: Allow additional tags in the	Clément Pit-Claudel	2021-03-15 20:33:20
● docutils, json: Fix generator banner when	Clément Pit-Claudel	2021-03-15 20:26:19
● css: Fix a display priority bug	Clément Pit-Claudel	2021-03-15 20:22:13
● css: Improve display in standalone and docu	Clément Pit-Claudel	2021-03-15 20:13:51
● emacs: Add a presentation mode to hide ann	Clément Pit-Claudel	2021-03-15 20:13:19
● cli: Invoke coqdoc in a temporary directory	Clément Pit-Claudel	2020-12-18 19:21:11
● cli: Add explicit utf-8 encoding to open()	Clément Pit-Claudel	2020-12-14 21:12:57
● Merge pull request #13 from palmskod/write	Clément Pit-Claudel	2020-12-14 21:11:05

SHA1 ID: **c7ee51ce16d126f3158bf483dd6c6f5179e804c7** ← Row 579/ 982

Find ↓ ↑ commit containing: Exact All fields

Search

◆ Diff ◆ Old version ◆ New version Lines of context: 3 Ignore space change

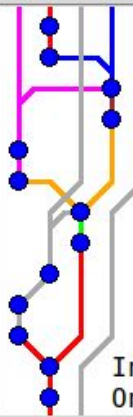
```
----- assets/alectryon.js -----
index 09b242f..6a469d0 100644
@@ -74,7 +74,7 @@ var Alectryon;

function onkeydown(e) {
    e = e || window.event;
-    if (e.ctrlKey) {
+    if (e.ctrlKey || e.metaKey) {
        if (e.keyCode == keys.ARROW_UP)
            slideshow.previous();
        else if (e.keyCode == keys.ARROW_DOWN)
```

◆ Patch ◆ Tree

Comments
alectryon/html.py
assets/alectryon.js

File Edit View Help



Fix slow telemetry module (#193607)
 support icons for profiles (#193604)
 Merge pull request #193593 from microsoft/tyriar/xterm@5.4.0-beta.27
 SCM - Add file decorations to history item changes
 show notification after downloading successfully (
 Merge pull request #193580 from microsoft/joh/profes
 Make command center not configurable, avoid confusio
 SCM - set of fixes for the SCM Sync View (#193567)
 Top padding is wrong on comment view zone (#193569)
 accessibility improvements (#193571)
 Indicates end of line positions
 Only keep one pending comment per location for continu

Logan Ramos <lramos15@gmail	2023-09-20 21:14:12
Sandeep Somavarapu <sasomava	2023-09-20 20:28:13
Daniel Imms <2193314+Tyriar	2023-09-20 18:32:21
Daniel Imms <2193314+Tyriar	2023-09-20 18:06:58
Ladislau Szomoru <3372902+l	2023-09-20 17:11:15
Sandeep Somavarapu <sasomava	2023-09-20 17:02:36
Johannes Rieken <johannes.r	2023-09-20 16:45:26
Johannes <johannes.rieken@g	2023-09-20 16:15:44
Ladislau Szomoru <3372902+l	2023-09-20 14:57:14
Alex Ross <alros@microsoft.	2023-09-20 14:47:40
Sandeep Somavarapu <sasomava	2023-09-20 14:40:51
Henning Dieterichs <hdieter	2023-09-20 12:00:29
Alex Ross <alros@microsoft.	2023-09-20 10:56:37

SHA1 ID: 5528f93f38672ab788c5ce78251926dce3a59a94



Row

266 / 114079

Find commit containing:

Exact All fields

Search

Diff Old version New version

Lines of context: 4

Ignore space

Top padding is wrong on comment view zone (#193569)

Fixes #193140

Co-authored-by: Martin Aeschlimann <martinae@microsoft.com>

----- src/vs/workbench/contrib/comments/browser/commentThreadWidget.ts -----
 index aff152a1a9c..0b4723b0c50 100644

```
@@ -199,9 +199,9 @@ export class CommentThreadWidget<T extends IRange | ICellRa
    }

    display(lineHeight: number) {
-      const headHeight = Math.ceil(lineHeight * 1.2);
+      const headHeight = Math.max(23, Math.ceil(lineHeight * 1.2));
      this._header.updateHeight(headHeight);

      this._body.display();
```

Patch Tree

Comments

src/vs/workbench/contrib/com
 ments/browser/commentThreadW
 idget.ts

Intro to Version-Control Systems

Learning objective I
Tracking your own code

- Set up and use a git repository to keep track of your own projects
- Describe the value of version-control systems for individual projects

Demo I

Tracking your own code

```
git help
git config
mkdir
sbt new scala/scala3.g8
git init
git status
git add
git restore
git commit -m
git log
git show
.gitignore
git commit -amend
git tag -m "" v
```

Intro to Version-Control Systems

Learning objective II
Exploring history

- Browse logs to understand the history of a software project or a piece of code
- Describe the value of version-control systems for collaborative projects

Demo II

Exploring history

```
git clone  
git format-patch  
git shortlog -since  
git blame — with a UI!  
git log -L — with a UI!
```

**Consult the command-line transcript
posted to <https://cs-214.epfl.ch> for the
live-coding part of the lecture!**