Introduction to Monte Python

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Outline

1. git, Github, and why it matters
   - Motivation
   - How to use it?
   - Design Strategy
2. How to contribute
3. Tests

Outline

Version Control

Survey

CVS, SVN, git, mercurial?

Who uses it daily (weekly? ever?)

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Solution

open-source, **documented**, **version-controlled** software

Motivation

What is Version Control ?

- System that keeps tracks of different **versions** of a code (several file), tracking its entire **history** of creation.
- Accessible from a **central repository**, that stores all the versions, and allow communication between developers.
- Can revert to a previous version to **reproduce** exactly the behaviour at a certain time (bug hunting)

Why does it matter?

Version Control in general

Pros

- Hard-drive failure safe
- Programmer's stupidity safe
- Bug-hunting made easier
- Collaborating
- Robustness

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Cons

- getting use to (g)it ...

Softwares

Version Control Softwares

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Github

CLASS and Monte Python

Code hosted on Github

- nice code browsing
- diff and downloads of old versions
- easy integration of contributions (forks)
- Wiki complementing the documentation
- Issues ($\simeq$ forum, suggestions)

How to use it?

Without too much effort?

Install git on your machine

- `Debian-based`: sudo apt-get install git
- `Mac OS X`: sudo port install git-core +svn +doc
- `Windows`: `http://msysgit.github.com/`

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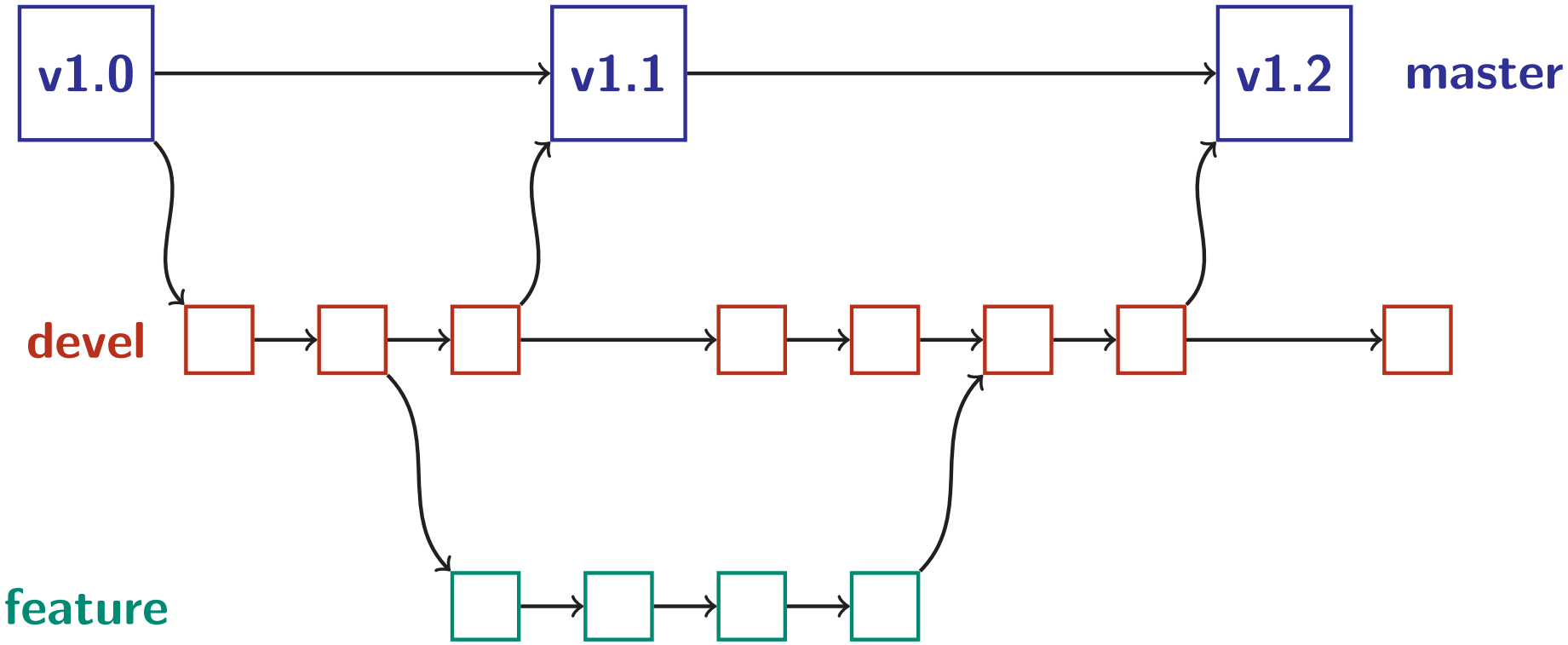
Install CLASS and Monte Python via git...

```
cd codes/
git clone https://github.com/lesgourg/class_public.git class
git clone https://github.com/baudren/montepython_public.git montepython
```

Design Strategy for both CLASS and Monte Python



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- **Master** branch (public and private) and **devel** branch(es)
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- **devel** is for the day to day work, potentially ugly commits, that end up doing something.
- **feature** branches are for developing big modifications without perturbing day to day work.

Using Github

Practising with the website

- go to `http://github.com/lesgourg/class_public`
- look at the latest commits, the diff,
- download version 2.1.2

Outline

How to contribute

Worflow

- on Github: fork the repository
- You now have your own version of CLASS
- Create a new branch `my_awesome_model`
- Modifying and commiting
- Send us the modification as a Pull-Request
  https://github.com/lesgourg/class_public/wiki/Contributing

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For instance: `https://github.com/baudren/montepython_public/pull/12`

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But you do not need it. Have a machine somewhere in your lab with ssh access, always on? Set up your remote repository! It is that easy.

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How?

- on the remote machine: `git clone github_montepython`
- on your machine:
  `git clone ssh://memyself@remote.mpa.kw.we.de/path/to/montepython montepython`
- that's it

Outline

For the motivated...

For the motivated...
Tests!

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- Should we store hundreds of parameters and check at **every modification** that CLASS still works?
- No!
- Automatize away!

How does it work?

CLASS

Principle: using nosetests

In the file `python/test_class.py`
Different scenarios tested, each with different outputs, each with different gauge, each w/ or w/o non linear corrections..

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```
    @parameterized.expand(
        itertools.product(
            ('LCDM',
             'Mnu',
             'Positive_Omega_k',
             'Negative_Omega_k',
             'Isocurvature_modes', ),
            ({'output': ''}, {'output': 'mPk'}, {'output': 'tCl'},
             {'output': 'tCl pCl lCl'}, {'output': 'mPk tCl lCl', 'P_k_max_h/Mpc':10},
             {'output': 'nCl sCl'}, {'output': 'tCl pCl lCl nCl sCl'}),
            ({'gauge': 'newtonian'}, {'gauge': 'sync'}),
            ({}, {'non linear': 'halofit'})))
    def test_wrapper_implementation(self, name, scenario, gauge, nonlinear):
```

How does it work?

Monte Python

Way to ensure all the default behaviour

check that:

- the code complains with no param file
- the param file is read only once
- the cosmo module has all the needed functions
- the data is well initialized from param file
- that MH, CH, NS and IS are working