

# A Crash Course for SU2 Hackers

Dr. Thomas D. Economon

3rd Annual SU2 Developers Meeting  
University of Strathclyde  
September 16, 2018

**So, you want to be an SU2 developer?**

**Good news: it's easy.**

**We leverage standard development processes  
and the latest tools for open-source projects.**

**You will be ready to hack at the end of this talk.**

Git/Branching

Development

Regressions

Pull Request

Release

The collage illustrates the development workflow for the `su2code/SU2` repository. It includes the following elements:

- Repository Header:** Shows the repository name `su2code / SU2`, a search bar, and navigation links for Pull requests, Issues, Marketplace, and Explore.
- Commit History:** A list of recent commits with titles like "Fix relative import in ordered\_bunch.py" and "Add polar attribut to TestCase".
- Pull Request #424:** A detailed view of a pull request titled "Py2 and Py3 support #424". It shows the "Merged" status, the author "Tim Albring", and the target branch "develop".
- Check Status:** A section indicating "1 check passed" for the "continuous-integration/travis-ci/pr" workflow, with the message "The Travis CI build passed".
- Branch Management:** A notification stating "petebachant deleted the petebachant:py2\_and\_py3\_support branch 7 days ago".
- Build Status:** A green badge indicating "build passing".
- Commit Count:** A badge showing "5,098 commits".
- Branch Selection:** A dropdown menu showing the current branch as "develop".

Anyone can be an SU2 developer.

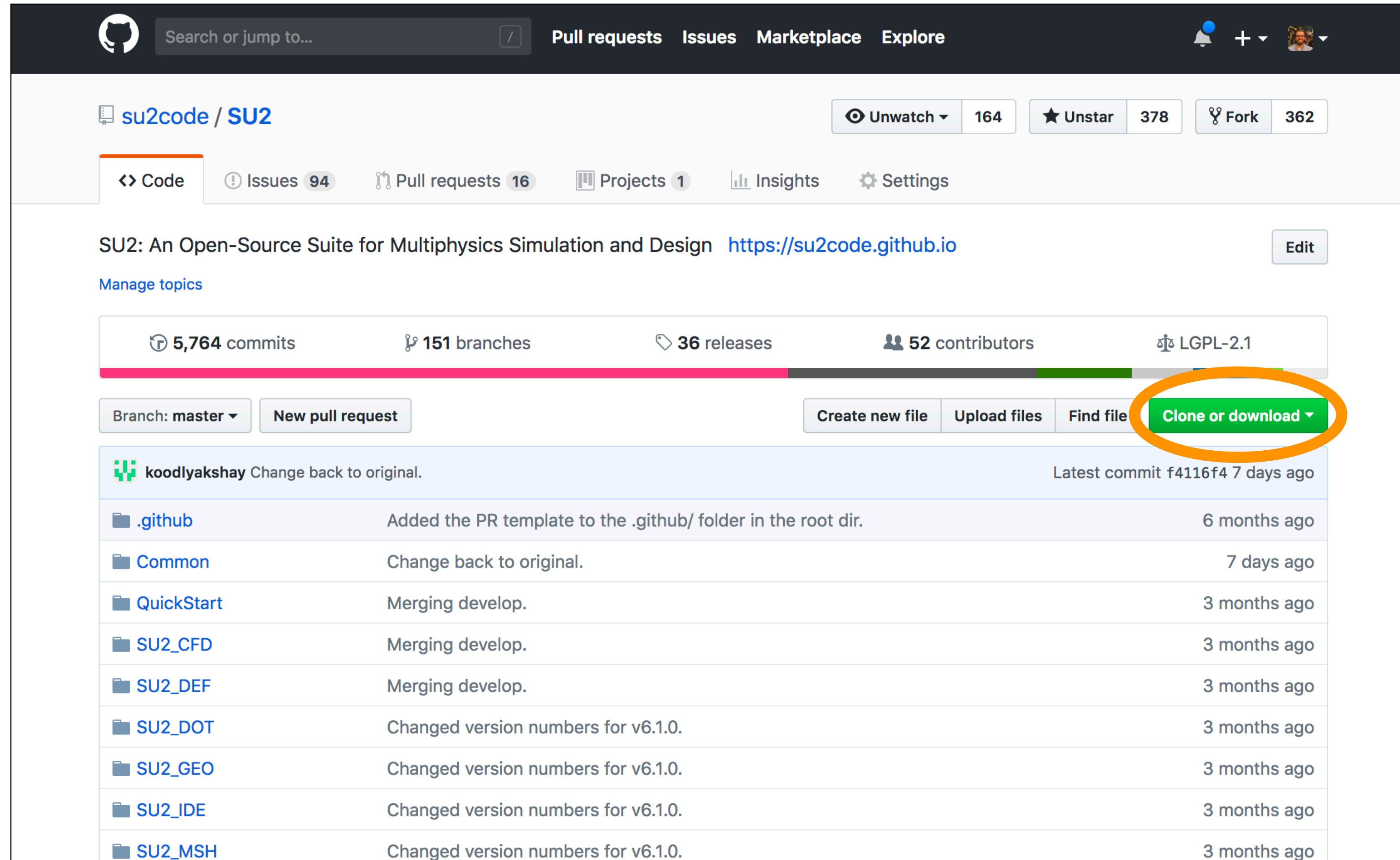
Git/Branching

Development

Regressions

Pull Request

Release



su2code / SU2

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Code Issues 94 Pull requests 16 Projects 1 Insights Settings

SU2: An Open-Source Suite for Multiphysics Simulation and Design <https://su2code.github.io> Edit

Manage topics

5,764 commits 151 branches 36 releases 52 contributors LGPL-2.1

Branch: master New pull request Create new file Upload files Find file Clone or download

koodlyakshay Change back to original. Latest commit f4116f4 7 days ago

.github	Added the PR template to the .github/ folder in the root dir.	6 months ago
Common	Change back to original.	7 days ago
QuickStart	Merging develop.	3 months ago
SU2_CFD	Merging develop.	3 months ago
SU2_DEF	Merging develop.	3 months ago
SU2_DOT	Changed version numbers for v6.1.0.	3 months ago
SU2_GEO	Changed version numbers for v6.1.0.	3 months ago
SU2_IDE	Changed version numbers for v6.1.0.	3 months ago
SU2_MSH	Changed version numbers for v6.1.0.	3 months ago

Your starting point: <https://github.com/su2code/SU2>.



Git/Branching

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Regressions

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Release



<http://xkcd.com/1597/>

Git/Branching

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***Here's that list of shell commands you should memorize:***

- \$ git clone <https://github.com/su2code/SU2.git>
- \$ git branch
- \$ git checkout -b feature\_awesome origin/feature\_awesome
- \$ git status
- \$ git diff
- \$ git commit -am "This is an awesome commit."
- \$ git push origin feature\_awesome
- \$ git checkout develop
- \$ git pull origin develop
- \$ git merge develop

***And their translations:***

- Get a fresh copy of the entire repo (master branch to start)
- Check which branches I have locally
- Check out my feature branch that is already on the remote
- Check which files have changed since last commit
- Detailed diff of code changes since last commit
- While working, make commits frequently with messages
- Regularly push to the remote on GitHub
- Switch to the develop branch (assuming you have it locally)
- Merge the changes in the remote develop into local develop
- Merge the changes from local develop into current local branch

Git/Branching

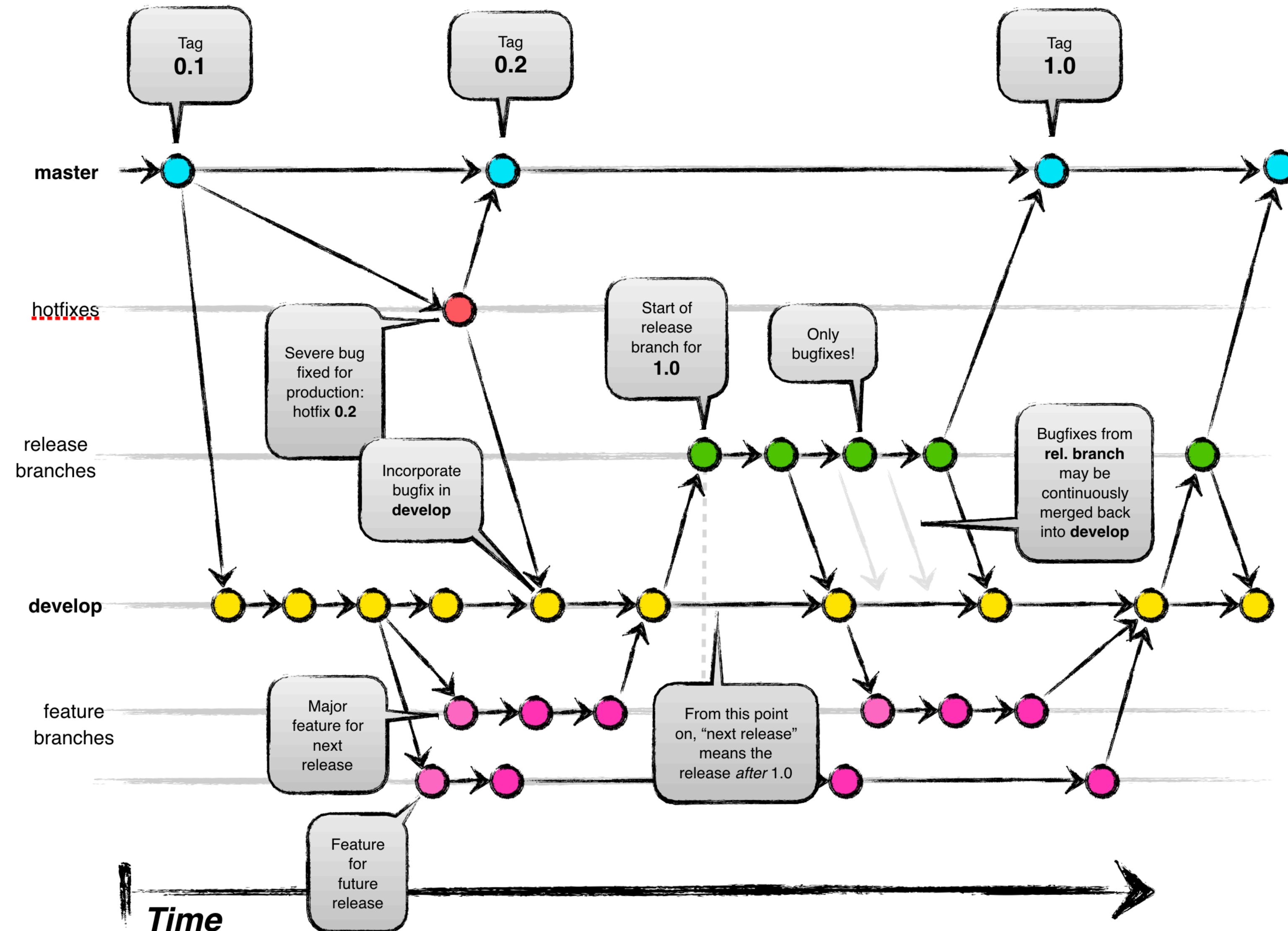
Development

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Release

We use the popular  
**Gitflow** branching model.



Author: Vincent Driessen  
Original blog post: <http://nvie.com/archives/323>  
License: Creative Commons




Git/Branching

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🕒 5,764 commits


**🌿 151 branches**

📦 36 releases

👤 52 contributors

📄 LGPL-2.1

Branch: master [New pull request](#) [Create new file](#) [Upload files](#) [Find file](#) [Clone or download](#)

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📁 <a href="#">SU2_MSH</a>	Changed version numbers for v6.1.0.	3 months ago

See all of our public repo branches here.

Git/Branching

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A current snapshot of active branches

Active branches									
feature_hom_Intel	Updated 4 hours ago by vdweide		2   725				New pull request		
feature_hom_wallModel	Updated 21 hours ago by GomerOfDoom		2   743				New pull request		
feature_output	Updated a day ago by talbring		2   199				New pull request		
feature_SST_UQ	Updated 2 days ago by jayantmukho	✓	2   207			#570	Open		
feature_hom_shock_capturing	Updated 2 days ago by chamsolli		2   809				New pull request		
feature_hom	Updated 2 days ago by vdweide	✓	2   806			#565	Open		
feature_caa	Updated 2 days ago by BeckettZhou	✗	384   80				New pull request		
feature_reformat_config	Updated 2 days ago by rsanfer	✓	2   215				New pull request		
feature_external_sens	Updated 2 days ago by economon		2   118				New pull request		
feature_error_message	Updated 4 days ago by vdweide	✓	2   178			#574	Open		
feature_custom_fluid	Updated 7 days ago by economon		2   173				New pull request		
feature_cgns	Updated 7 days ago by economon		2   174				New pull request		
feature_periodic	Updated 7 days ago by economon		2   170				New pull request		
fix_sorting	Updated 7 days ago by economon	✓	2   171			#576	Open		
remove_poisson_wave_solvers	Updated 7 days ago by rsanfer	✓	2   181			#573	Open		
feature_TNE2	Updated 8 days ago by WallyMaier		2   104				New pull request		
feature_inc_wf	Updated 8 days ago by vdweide	✓	2   166				New pull request		
🛡️ develop	Updated 8 days ago by vdweide	✓	2   166				New pull request		

Note that develop is a protected branch

Git/Branching

Development

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The screenshot displays the GitHub repository page for `su2code / SU2`. The repository has 164 watchers, 378 stars, and 362 forks. The 'Fork' button is highlighted with a pink circle. Below the repository name, there are tabs for Code, Issues (94), Pull requests (16), Projects (1), Insights, and Settings. The repository description is 'SU2: An Open-Source Suite for Multiphysics Simulation and Design' with a link to <https://su2code.github.io>. The repository statistics bar shows 5,764 commits, 151 branches, 36 releases, 52 contributors, and the LGPL-2.1 license. A yellow circle highlights the 'Branch: master' dropdown menu. Below the statistics, there is a table of recent commits.

Commit Message	Author	Time
Change back to original.	koodlyakshay	7 days ago
Added the PR template to the .github/ folder in the root dir.		6 months ago
Change back to original.		7 days ago
Merging develop.		3 months ago
Merging develop.		3 months ago
Merging develop.		3 months ago
Changed version numbers for v6.1.0.		3 months ago
Changed version numbers for v6.1.0.		3 months ago
Changed version numbers for v6.1.0.		3 months ago
Changed version numbers for v6.1.0.		3 months ago

New branches can be made in the browser interface here or by pushing local branches to the remote with git.



Git/Branching

Development

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Release

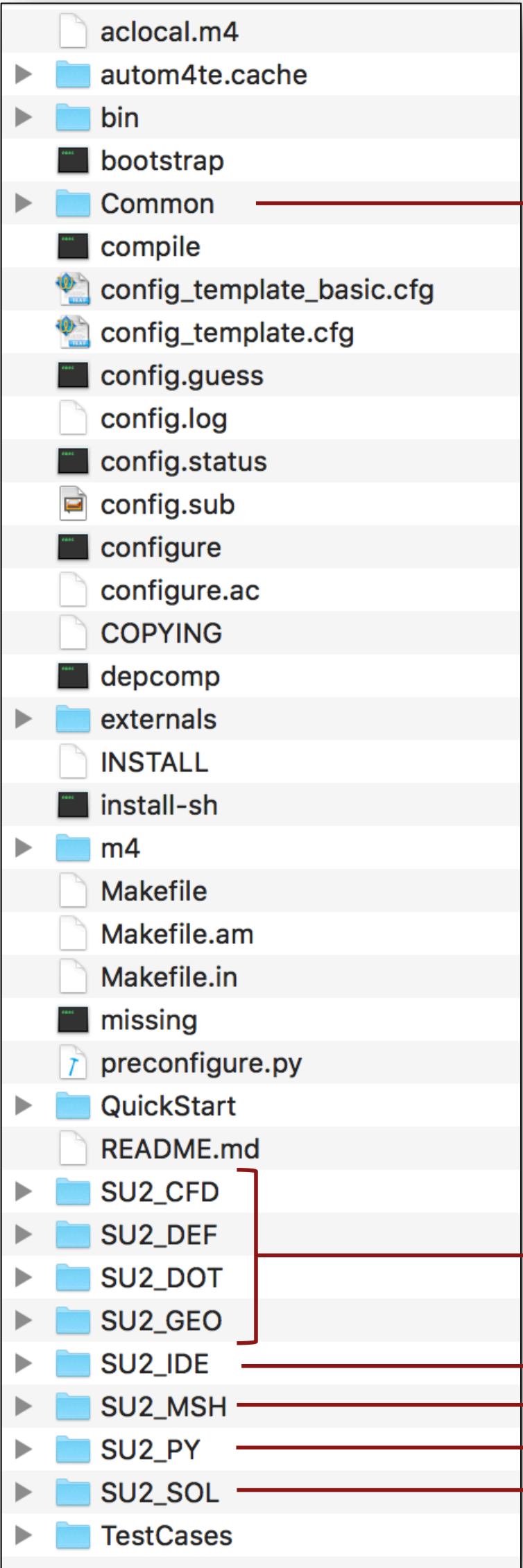
Run ./bootstrap to  
reset autotools

Template config file  
with all options

External source files,  
e.g., ParMETIS

Inviscid NACA 0012

Config files for tests



**Here is what you see  
inside the SU2/ repo.**

C++ Source Code in SU2\_\*/src/, majority of lines in  
Common/src/ & SU2\_CFD/src

IDE project files, e.g., Xcode

Python Scripts

Git/Branching

Development

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## C++ Executables

- SU2\_CFD -> Primary multiphysics PDE solver for primal and adjoint
- SU2\_SOL -> Solution export code
- SU2\_DEF -> Mesh deformation
- SU2\_DOT -> Gradient projection
- SU2\_GEO -> Geometry definition
- SU2\_MSH -> Mesh adaptation

## Python Scripts (just a subset of them)

- parallel\_computation.py
- mesh\_deformation.py
- shape\_optimization.py
- continuous\_adjoint.py
- discrete\_adjoint.py
- finite\_differences.py
- direct\_differentiation.py

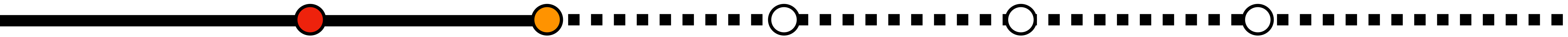
Git/Branching

Development

Regressions

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- C++ class abstractions encourage code reuse and data encapsulation ensures you can make localized changes easily.
- Common base classes/methods (grid, linear solvers, output, etc.) are reused for many sets of physical governing equations.
- For a particular PDE, we define iteration, numerics, solver, and variable classes that are customized for the particular methods and algorithms.
  - Files with \*\_structure.cpp contain base classes.
  - Files with solver\_\*.cpp, variable\_\*.cpp, numerics\_\*.cpp, contain child classes for a particular PDE, e.g., solver\_direct\_mean.cpp for mean flow.

Git/Branching

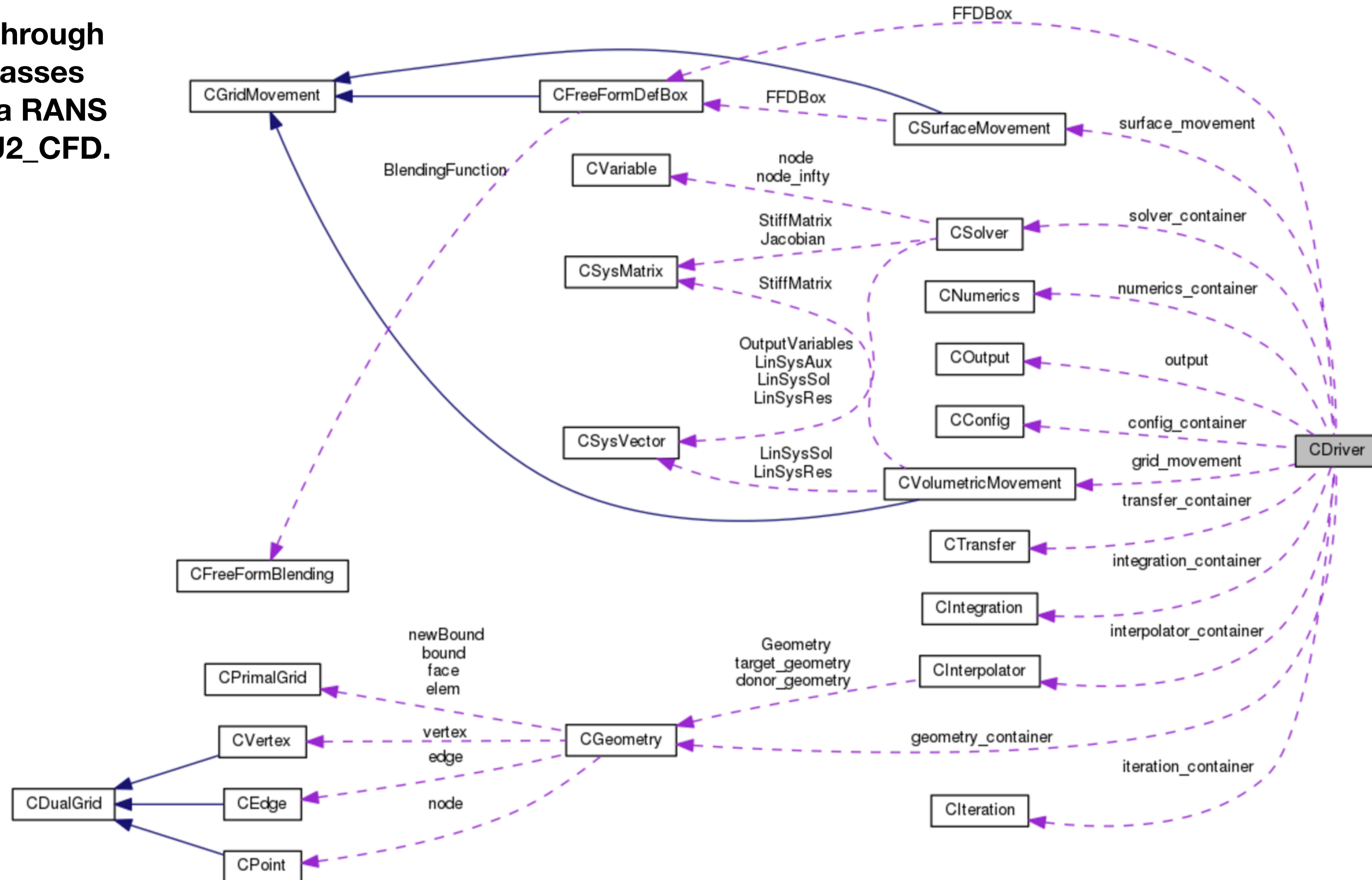
Development

Regressions

Pull Request

Release

Top-down walkthrough  
of some key classes  
instantiated for a RANS  
calculation in SU2\_CFD.





Git/Branching

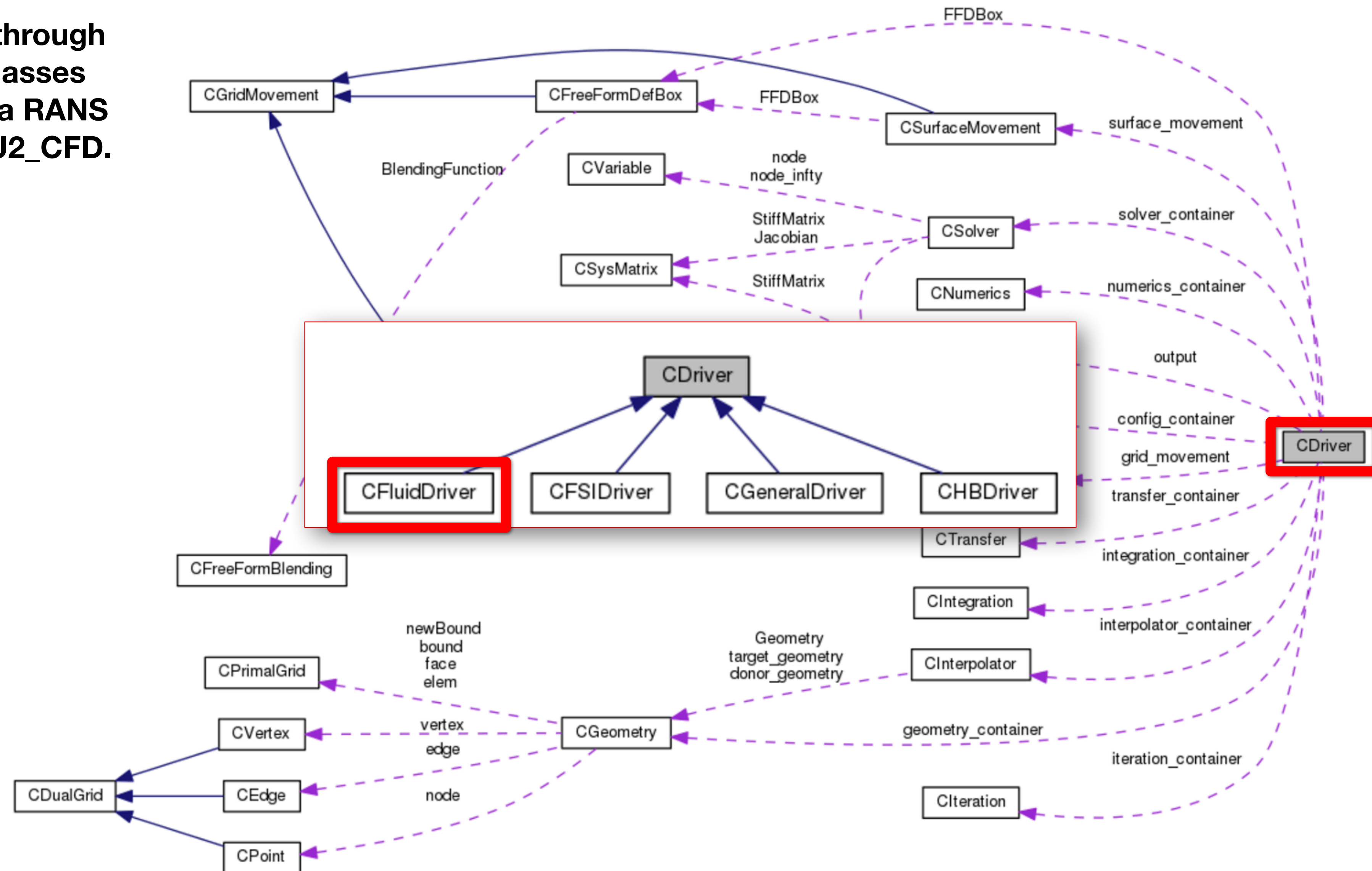
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Git/Branching

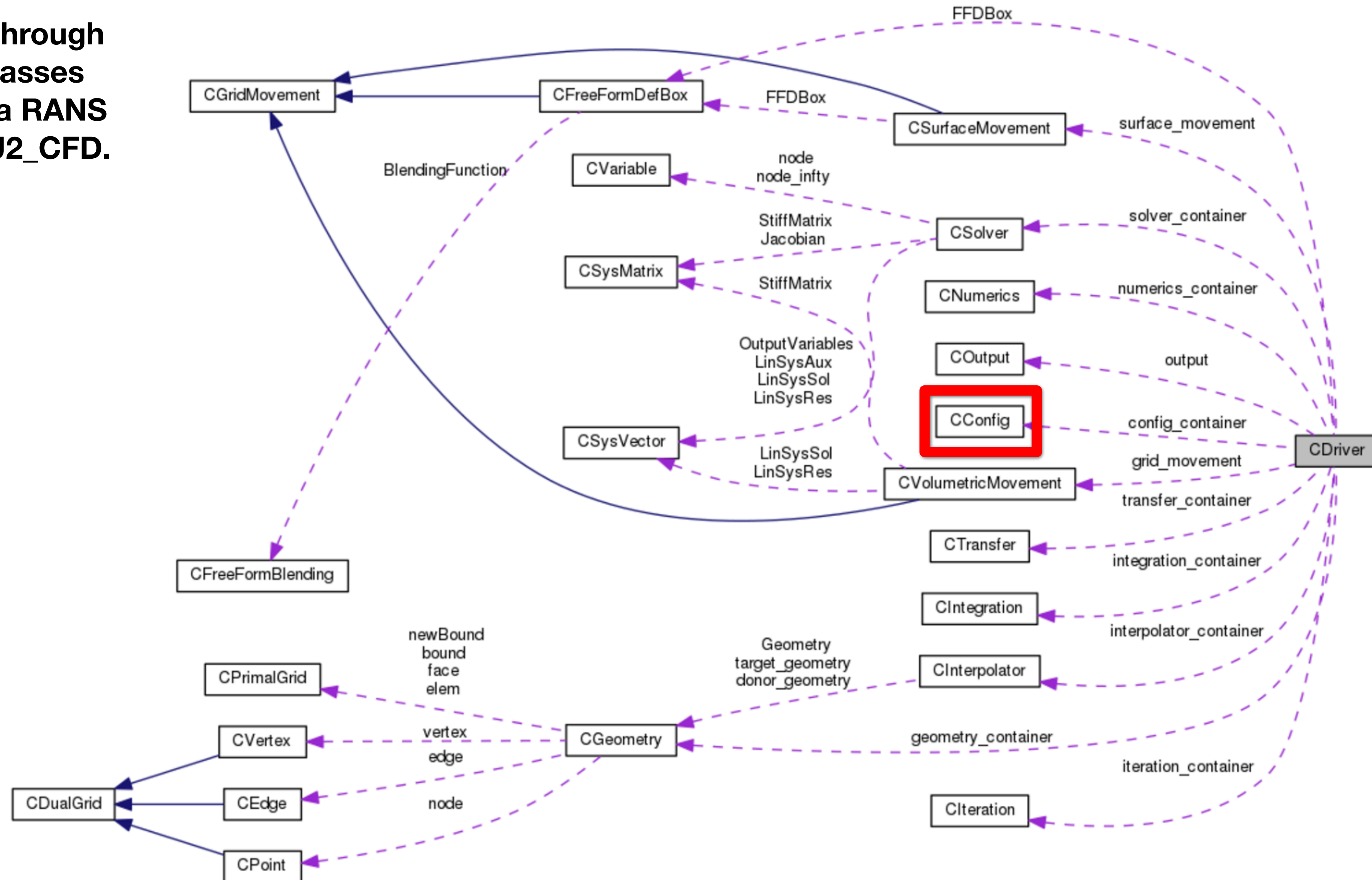
Development

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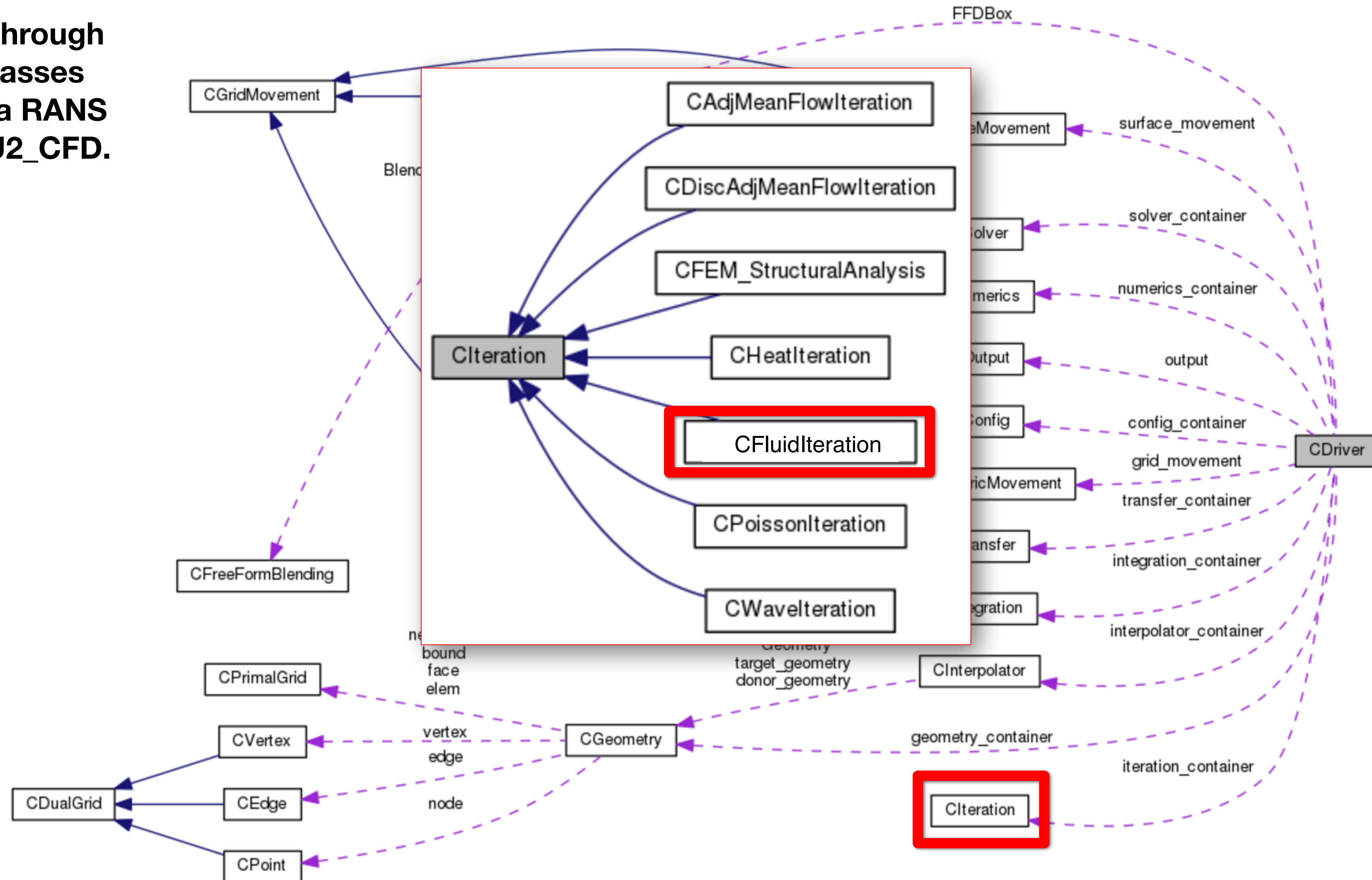
Top-down walkthrough  
of some key classes  
instantiated for a RANS  
calculation in SU2\_CFD.





Release

# Top-down walkthrough of some key classes instantiated for a RANS calculation in SU2\_CFD.



Git/Branching

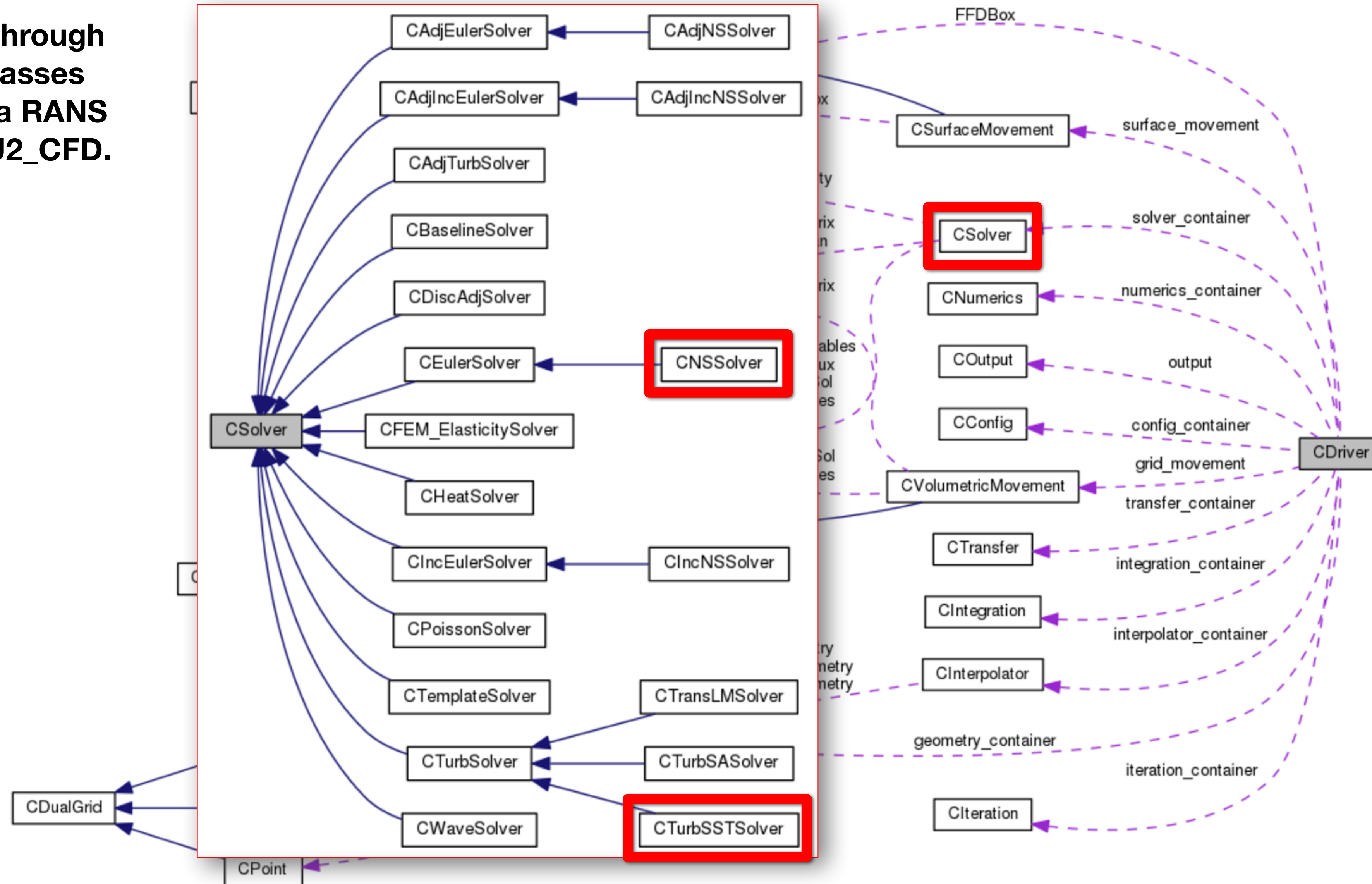
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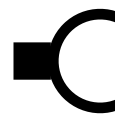
Git/Branching

Development

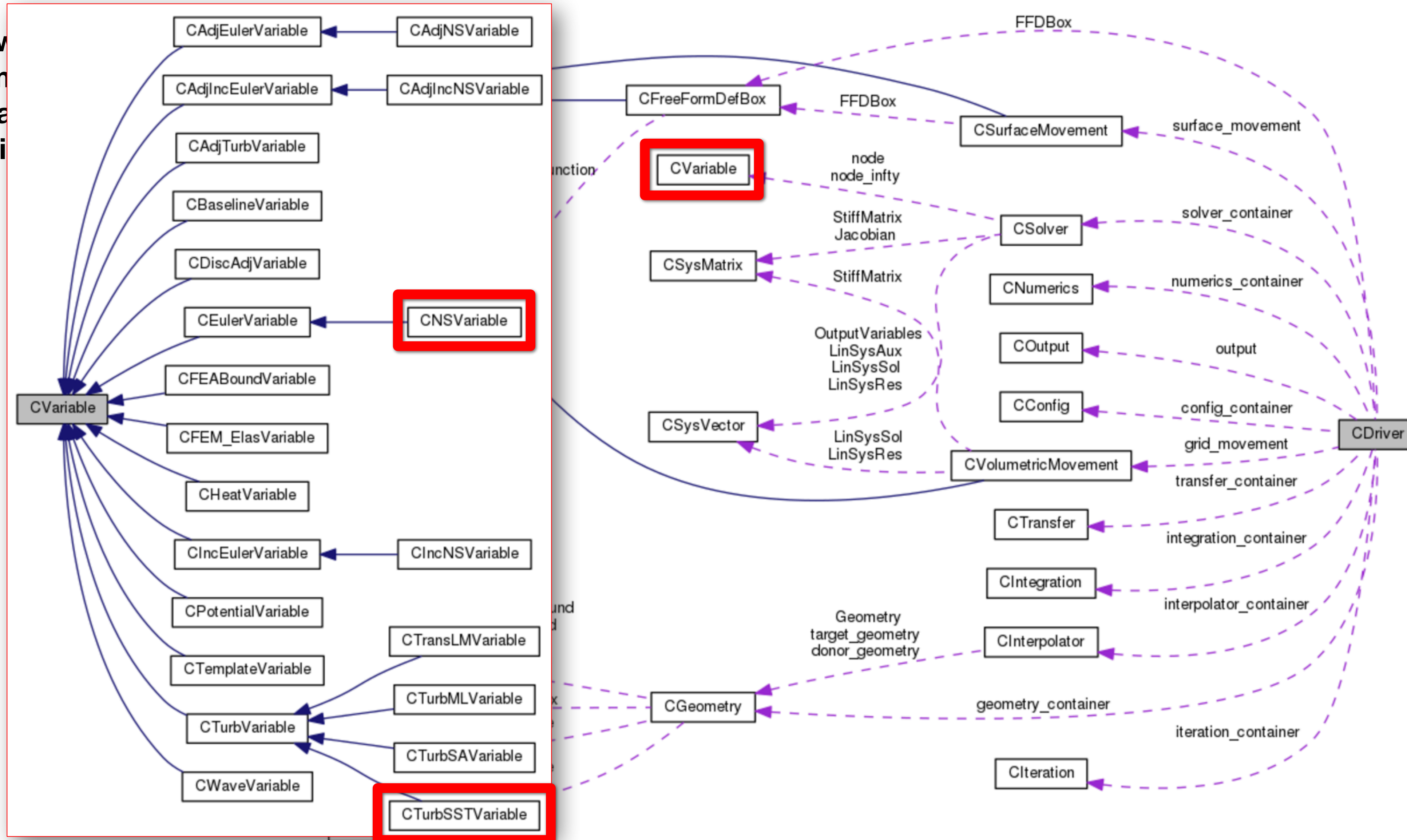
Regressions

Pull Request

Release



Top-down  
of some  
instantia  
calculati



Git/Branching

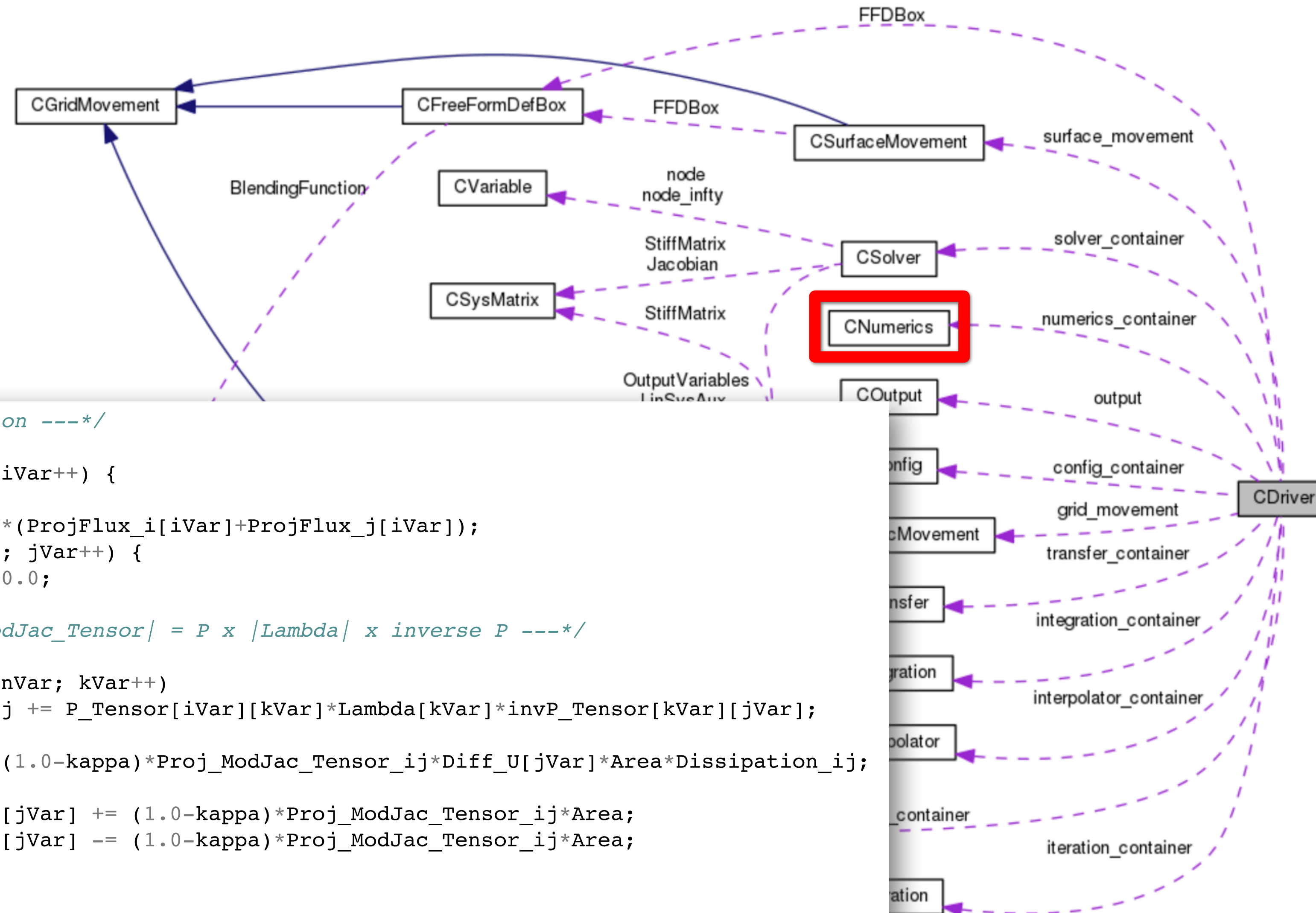
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Git/Branching

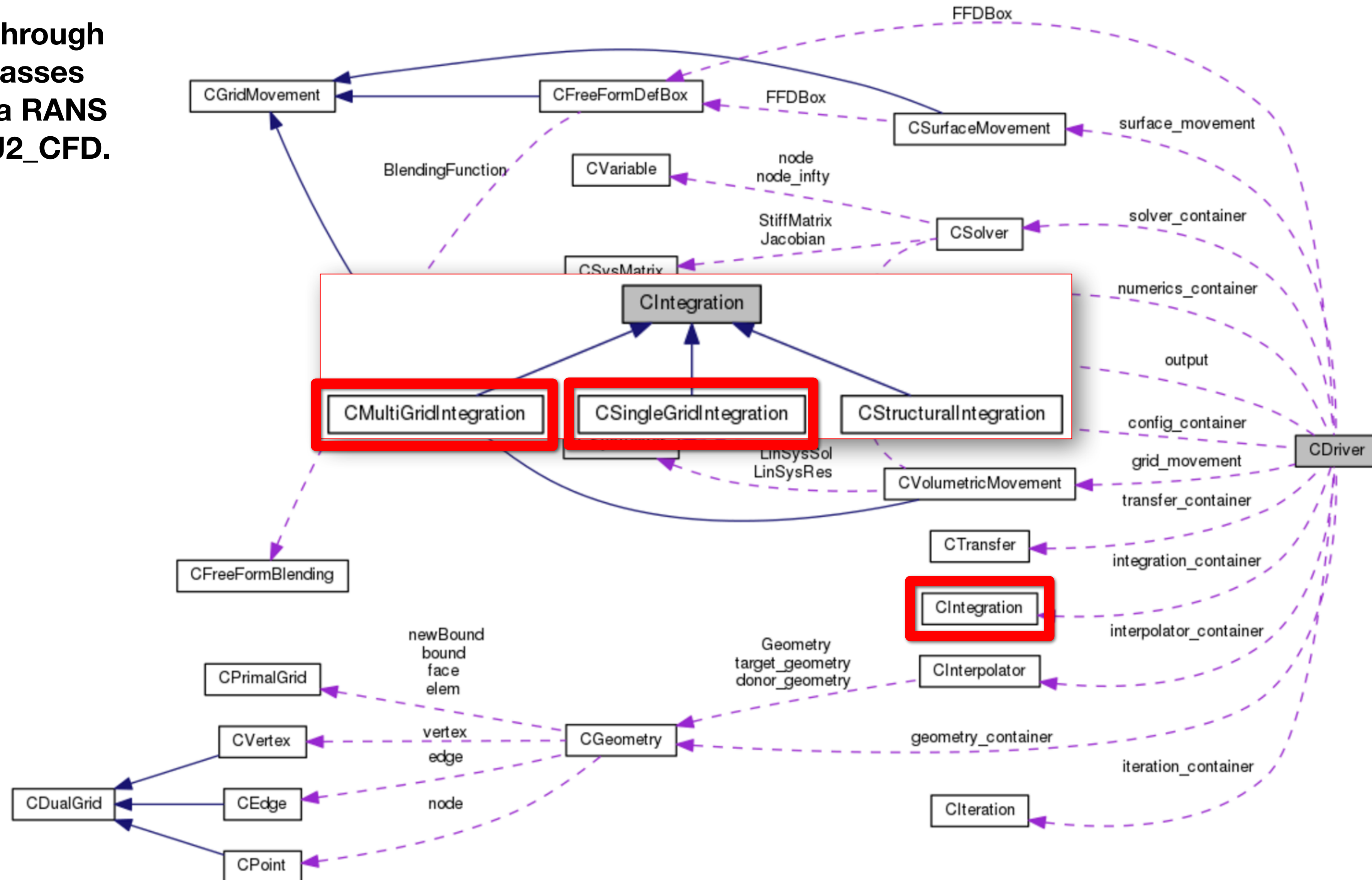
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Git/Branching

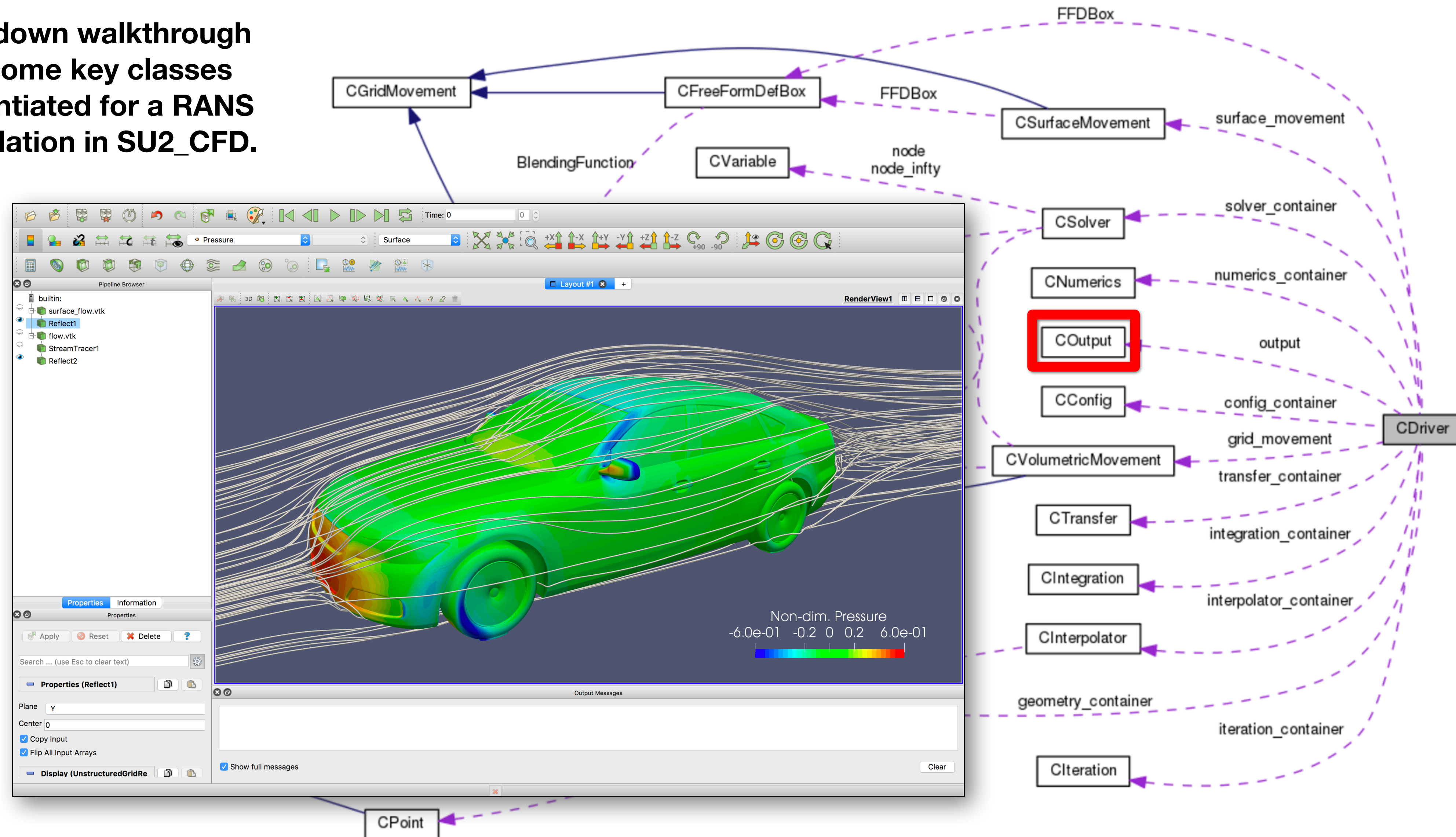
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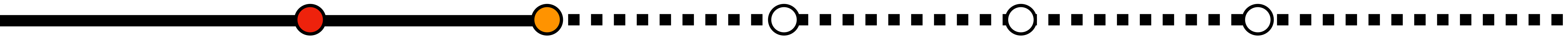
Git/Branching

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- Now that you know the basics, you are ready to create a new branch for your awesome feature (feature\_awesome) and start hacking.
- But you might say, "Wait, how do I coordinate my contribution with other ongoing work in the repository?"
  - Posting **issues on GitHub** and interacting with the SU2 IDS are great ways to discuss potential developments and coordinate among other developers in the open.
- And then maybe you'll ask, "How can I make sure that my work doesn't 'break' other capabilities that already exist in SU2?"
  - **Continuous integration will save your bacon.** Travis CI is free for open-source!

Git/Branching

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# SU2 (ver. 6.1.0 "Falcon"): The C

Computational analysis tools have revolutioniz  
proprietary, unavailable, or prohibitively expen  
analysis and design freely available as open-s

For an overview of the technical details in SU2

"SU2: An open-source suite for multiphysics s  
<http://arc.aiaa.org/doi/10.2514/1.J053813>

build passing

**Our security blanket: a  
comprehensive suite of  
~200 regression test cases  
for serial, parallel, physics,  
AD, python, etc.**

su2code / SU2

build unknown

Travis CI

Current Branches Build History Pull Requests > Build #2312

More options

✓ develop Merge pull request #575 from pecos-hybrid/bugfix\_viscosity\_in\_FD

✓ #2312 passed

Restart build

Change dynamic viscosity in FD hybrid central / upwind blending to  
kinematic viscosity

Ran for 2 hrs 5 min 54 sec

Total time 8 hrs 9 min 37 sec

8 days ago

Commit d00c3b3

Compare a0ecddf..d00c3b3

Branch develop

Edwin van der Weide authored GitHub committed

Build Jobs

✓ # 2312.1	 </> Python: 2.7	CONFIGURE_COMMAND="./preconfigure.py --prefix=\$TRAVIS_BUI...	1 hr 3 min 49 sec	
✓ # 2312.2	 </> Python: 3.6	CONFIGURE_COMMAND="./preconfigure.py --prefix=\$TRAVIS_BUI...	1 hr 3 min 25 sec	
✓ # 2312.3	 </> Python: 2.7	CONFIGURE_COMMAND="./preconfigure.py --enable-mpi --with-cc...	58 min 49 sec	
✓ # 2312.4	 </> Python: 3.6	CONFIGURE_COMMAND="./preconfigure.py --enable-mpi --with-cc...	58 min 31 sec	
✓ # 2312.5	 </> Python: 2.7	CONFIGURE_COMMAND="./preconfigure.py --with-cc=gcc --with-c...	1 hr 3 sec	
✓ # 2312.6	 </> Python: 3.6	CONFIGURE_COMMAND="./preconfigure.py --with-cc=gcc --with-c...	59 min 52 sec	
✓ # 2312.7	 </> Python: 2.7	CONFIGURE_COMMAND="./preconfigure.py --enable-mpi --with-cc...	1 hr 36 sec	
✓ # 2312.8	 </> Python: 3.6	CONFIGURE_COMMAND="./preconfigure.py --enable-mpi --with-cc...	1 hr 4 min 32 sec	





Git/Branching

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**New capabilities in your feature branch should also have a test case to protect them in the future.**

```
# NACA0012
naca0012 = TestCase( 'naca0012' )
naca0012.cfg_dir = "euler/naca0012"
naca0012.cfg_file = "inv_NACA0012_Roe.cfg"
naca0012.test_iter = 20
naca0012.test_vals = [-4.047448, -3.538057, 0.338691, 0.023131] #last 4 columns
naca0012.su2_exec = "SU2_CFD"
naca0012.timeout = 1600
naca0012.tol = 0.00001
test_list.append(naca0012)
```

If the computed values after one of your commits don't match these values, you will get an email with details of the failed cases. Investigate it!

**1. Add a new test case to serial\_regression.py, parallel\_regression.py, etc. Use others as a guide. See NACA 0012 example.**



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2. Put the config file and any supporting data in the corresponding locations. Travis CI combines the complementary sets.

su2code / SU2

Unwatch 164 Unstar 378 Fork 362

Code Issues 94 Pull requests 16 Projects 1 Insights Settings

Branch: master SU2 / TestCases / euler / naca0012 /

Create new file Upload files Find file History

economon Merging develop. Latest commit 08c5178 on Jun 19

..

inv\_NACA0012.cfg Merging develop. 3 months ago

inv\_NACA0012\_Roe.cfg Changed version numbers for v6.1.0. 3 months ago

Lighter weight, more frequently updated files go in code repo.

su2code / TestCases

Unwatch 73 Unstar 15 Fork 73

Code Issues 0 Pull requests 0 Projects 0 Wiki Insights Settings

Branch: master TestCases / euler / naca0012 /

Create new file Upload files Find file History

economon Moved config files only back over into SU2 repo from the TestCases repo. Latest commit 7b020e6 on Aug 11, 2015

..

mesh\_NACA0012\_inv.su2 Added all of the mesh files that are < 30 MB 4 years ago

Larger, more static files that support the tests go in the TestCases repo.



- So, you've finished your awesome feature and the tests are passing. You've even added your own regression test (or two), and you checked that there are no new compiler warnings and the style conforms to the SU2 standard.
- At this point you are wondering, "I would like to contribute my feature to the open source, but how do I do that?"
- To get your work into an official open-source release of SU2, the modifications have to first be staged in the develop branch.
- To do so, we use the standard **Pull Request (PR)** approach.




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5,764 commits 151 branches 36 releases 52 contributors LGPL-2.1

Branch: master New pull request Create new file Upload files Find file Clone or download

 [koodlyakshay](#) Change back to original. Latest commit f4116f4 7 days ago

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Once you're ready to contribute, it's PR time.

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su2code / SU2

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Code Issues 94 Pull requests 16 Projects 1 Insights Settings

Filters is:pr is:open Labels Milestones

New pull request

16 Open 278 Closed

Author Labels Projects Milestones Reviews Assignee Sort

- Fix Commands for SOL\_FSI, SOL and GEO in SU2\_PY/SU2/run/interface.py ✓  
#579 opened 3 days ago by Patschke • Review required 0 of 1
- Fix NTS duplicate calc •  
#577 opened 6 days ago by clarkpede • Review required 3 of 4 4
- Efficiency improvements for sorting + loading of grid information. ✓  
#576 opened 7 days ago by economon • Changes requested 3 of 4 1
- Feature error message ✓  
#574 opened 10 days ago by vdweide • Review required 0 of 1 8
- Remove legacy Poisson & Wave solvers ✓  
#573 opened 11 days ago by rsanfer • Review required 3 of 4 1
- Fix linear elasticity discrete adjoint ✓  
#571 opened 16 days ago by pcarruscag • Changes requested 3 of 4 6

**A PR is a request to the project to pull in your contribution. Can be from an internal branch or from an external fork.**

Git/Branching

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Submit the PR to the  
develop branch

Fill out the PR  
template questions  
that guide you along  
your way.



[Pull requests](#) [Issues](#) [Marketplace](#) [Explore](#)


 [su2code](#) / [SU2](#)


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# Open a pull request

Create a new pull request by comparing changes across two branches. If you need to, you can also [compare across forks](#).

 base: [develop](#) ← compare: [feature\\_awesome](#) ✓ Able to merge. These branches can be automatically merged.



This is an awesome typo fix.

Write

Preview

## Proposed Changes

\*Give a brief overview of your contribution here in a few sentences.\*

I am fixing an important typo.

## Related Work

\*Resolve any issues (bug fix or feature request), note any related PRs, or mention interactions with the work of others, if any.\*

N/A

## PR Checklist

\*Put an X by all that apply. You can fill this out after submitting the PR. If you have any questions, don't hesitate to ask! We want to help. These are a guide for you to know what the reviewers will be looking for in your contribution.\*

Attach files by dragging & dropping, [selecting them](#), or pasting from the clipboard.

Reviewers

No reviews—at least 1 approving review is required.

Assignees

No one—assign yourself

Labels

None yet

Projects

None yet

Milestone

No milestone

Styling with Markdown is supported

Create pull request



Git/Branching

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economy added some commits on Aug 16

- Cleaning up some loops for efficiency. ✗ bc77ebf
- More map usage for efficiency. ✗ f70c8a0
- Faster implementation of color distribution. ✗ ff7b098
- Merge branch 'develop' into fix\_sorting ✗ bd56f3b
- Preparing for PR. ✓ 9a2348e

✗ vdweide requested changes 4 days ago [View changes](#)

This all looks good to me. However, in geometry\_structure.cpp there are a few places where only the whitespace has changed, see the discussion we had for the feature\_hom branch. If you can change that, it is good to go.

Add more commits by pushing to the **fix\_sorting** branch on **su2code/SU2**.

✗ **Changes requested** [Hide all reviewers](#)  
1 review requesting changes by reviewers with write access. [Learn more.](#)

✗ vdweide requested changes [See review](#) [Dismiss review](#)

✓ **All checks have passed** [Hide all checks](#)  
1 successful check

✓ continuous-integration/travis-ci/pr — The Travis CI build passed Required [Details](#)

✗ **Merging is blocked** [Update branch](#)  
Merging can be performed automatically once the requested changes are addressed.

All regression tests must pass with your code integrated. Travis CI again takes care of this for us. Merging is blocked until passage.

Code is reviewed by fellow developers for content, organization, and style. PR is blocked until at least one approval! Our convention is 2 reviewer approvals.

PRs keep community informed, offer opportunity for discussion, and are a *controlled gate* for quality assurance of contributions.

Git/Branching

Development

Regressions

Pull Request

Release

Details of the tests for all PRs can be found over in Travis CI.

su2code / SU2		build unknown	
Current	Branches	Build History	Pull Requests
More options			
✓ PR #570	Feature sst uq	#2342 passed	7 hrs 54 min 5 sec
Jayant Mukhopadhaya		d7e05f9	about 17 hours ago
✓ PR #565	Feature hom	#2341 passed	9 hrs 33 min 54 sec
vdweide		e82f700	a day ago
✓ PR #565	Feature hom	#2338 passed	9 hrs 35 min 20 sec
vdweide		e6418bb	2 days ago
✓ PR #579	Fix Commands for SOL_FSI, SOL and GEO in SU2_PY/SU2/r	#2335 passed	8 hrs 1 min 48 sec
Patrick		e9f8913	2 days ago
✓ PR #565	Feature hom	#2334 passed	9 hrs 29 min 55 sec
vdweide		be211e3	3 days ago
✓ PR #565	Feature hom	#2333 passed	9 hrs 30 min 44 sec
vdweide		c37f4d9	3 days ago
✗ PR #570	Feature sst uq	#2332 failed	8 hrs 4 min 19 sec
Jayant Mukhopadhaya		1348d87	3 days ago
✓ PR #565	Feature hom	#2331 passed	11 hrs 27 min 48 sec
vdweide		7029bc1	4 days ago
✓ PR #574	Feature error message	#2330 passed	8 hrs 8 min 38 sec
vdweide		2d4bd6f	4 days ago



Git/Branching

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Release

The screenshot shows the GitHub repository page for `su2code / SU2`. The repository has 164 watchers, 378 stars, and 362 forks. The 'Releases' tab is selected, showing the latest release: **SU2 version 6.1.0 "Falcon"** by `economon`, released on Jun 22. The release includes 2 commits to master. There are two assets: [Source code \(zip\)](#) and [Source code \(tar.gz\)](#). The release description states: "SU2 v6.1.0 contains new features and upgrades, including:" followed by a bulleted list of features and improvements.

**SU2 version 6.1.0 "Falcon"**

`economon` released this on Jun 22 · [2 commits](#) to master since this release

Assets 2

- [Source code \(zip\)](#)
- [Source code \(tar.gz\)](#)

SU2 v6.1.0 contains new features and upgrades, including:

- All new feature set for incompressible flows:
  - Robust coupled algorithm (density-based) with a custom preconditioning.
  - Energy equation available for problems with heat transfer.
  - Constant and variable density flows (incompressible ideal gas).
  - Temperature-dependent transport properties.
- User-specified inlet boundary data from a file, e.g., velocity profiles.
- Upgrade of the grid partitioning routines for better scalability.
- Enhancements to SU2\_DEF for design parameterizations and mesh deformation.
- Usability improvements, bug fixes, and general maintenance.

**Releases: we move develop to master, create tags, binaries, and advertise. Your awesome feature is released!**



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- Introduction to SU2
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- Running SU2
- Developer Docs
- FAQ
- Contact

# SU2, the Open-Source CFD Code



## The Open-Source CFD

The SU2 suite is an open-source collection of C++ based software tools for performing Partial Differential Equation (PDE) analysis and solving PDE-constrained optimization problems. The toolset is designed with Computational Fluid Dynamics (CFD) and aerodynamic shape optimization in mind, but is extensible to treat arbitrary sets of governing equations such as potential flow, elasticity, electrodynamics, reacting flows, and many others. SU2 is under active development by individuals all around the world on [GitHub](#) and is released under an open-source license.

For a detailed description of the code philosophy, components, and implementations, please see our [SU2 AIAA Journal article](#).

✎ Improve this page

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su2code / su2code.github.io 58 Stars 1 Fork 16

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Branch: master su2code.github.io / \_docs / index.md Find file Copy path

economon New website 8766c49 on Feb 13 1 contributor

12 lines (8 sloc) 934 Bytes Raw Blame History

title	permalink	redirect_from
SU2, the Open-Source CFD Code	/docs/home/	/docs/index.html

The SU2 suite is an open-source collection of C++ based software tools for performing Partial Differential Equation (PDE) analysis and solving PDE-constrained optimization problems. The toolset is designed with Computational Fluid Dynamics (CFD) and aerodynamic shape optimization in mind, but is extensible to treat arbitrary sets of governing equations such as potential flow, elasticity, electrodynamics, chemically-reacting flows, and many others. SU2 is under active development by individuals all around the world on [GitHub](#) and is released under an open-source license.

For a detailed description of the code philosophy, components, and implementations, please see our [SU2 AIAA Journal article](#).

Documentation and tutorials are critical for amplifying the impact of your work. Good news: it's the same process to create it.

Git/Branching

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The screenshot shows the GitHub repository page for `su2code / SU2`. The repository is described as "SU2: An Open-Source Suite for Multiphysics Simulation and Design" with the URL <https://su2code.github.io>. The repository statistics show 5,764 commits, 151 branches, 36 releases, 52 contributors, and the LGPL-2.1 license. The commit history table is as follows:

Commit Message	Time Ago
Change back to original.	7 days ago
Added the PR template to the .github/ folder in the root dir.	6 months ago
Merging develop.	3 months ago
Merging develop.	3 months ago
Merging develop.	3 months ago
Changed version numbers for v6.1.0.	3 months ago
Changed version numbers for v6.1.0.	3 months ago
Changed version numbers for v6.1.0.	3 months ago
Changed version numbers for v6.1.0.	3 months ago

Keep up-to-date via email with all of the activity in the repo by “watching”

## **SU2 Development Survival Guide**

### *A Best Practice Workflow*

1. Clone main repository: \$ git clone <https://github.com/su2code/SU2.git>
2. Create new feature branch (in remote and locally) for your development work. Work on this branch in the repo.
3. Activate the regressions for your branch by changing to your branch name and email in .travis.yml. Use this to guide development and correct any failures along the way that you will be informed of by email.
4. Work on your feature! Please mind white space issues, compiler warnings, and match the SU2 style.
5. If you are working on a single branch for an extended amount of time, merge the remote develop branch into your own branch at regular, frequent intervals. This ensures that, when the time comes, it will be easy to merge your contribution into develop, as you will have solved any conflicts on your side before a PR.
6. Once you feel your feature is finished, submit a PR. Fill out the PR template that is provided for you.
7. Get reviews and engage with the community concerning your contribution. Fix problems in your branch or address any feedback on the message boards. Note that any new commits will appear right there in the open PR and will kick-off the regressions again.
8. Once the reviewers approve and the regressions pass, the community will merge in your work.
9. Celebrate your contribution and proudly introduce yourself as an SU2 developer at your social engagements.



**Pretty easy to be a developer, huh?**

**We have set up safety nets and removed overhead wherever possible.**

**So, try crazy ideas in your branches. Don't be afraid to make big changes that push the boundaries of the code. The community and infrastructure will be there to help you. This is how we make progress.**

## 3<sup>rd</sup> Annual SU2 Developers Meeting

September 16<sup>th</sup>-18<sup>th</sup>, 2018

University of Strathclyde, Scottish Universities Insight Institute (SUII)

Glasgow, Scotland, UK

### Meeting Agenda for Sunday September 16<sup>th</sup>

0900 – 0915: Welcome & Agenda

0915 – 1045: Introduction to developing in SU2: Covering high level class design, how to modify the code, working with GitHub (branching, PRs, regressions), etc.

1045 – 1615: Hack session: Separate groups working on various problems (lunch and snacks/coffee offered in the room while working)

1615 – 1700: Wrap-up Presentations: Two-slide presentations on major progress for the day, including discussion

1730 – open: Social at “The Counting House”, 2 St Vincent Place, G1 2DH

### Meeting Agenda for Monday September 17<sup>th</sup>

0800 – 0830: Welcome & Year in review, T. Economon (Bosch), J.J. Alonso (Stanford)

0830 – 0900: SU2-NEMO - Thermochemistry and high-Mach aerothermodynamics, M. Fossati (U. of Strathclyde), T. Magin, J.B. Scoggins, M. Pini, P. Colonna, R. Sanchez, T. Economon, D. Mayer, N. Beishuizen, C. Garbacz-Gomes, W.T. Meier, J.J. Alonso, T. van der Stelt

0900 – 0930: Toward optimization for reactive flows in SU2, N. Beishuizen (Bosch), D. Mayer, T. Economon

0930 – 1000: Conjugate heat transfer problems and computing coupled discrete adjoints using AD, O. Burghardt (TU Kaiserslautern), T. Albring, N. Gauger

1000 – 1030: Coffee break

1030 – 1100: Physics-based RANS model-form UQ in SU2, J. Mukhopadhyaya (Stanford), A. Mishra, J.J. Alonso, G. Iaccarino

1100 – 1130: Aeroacoustics prediction and optimization capabilities in SU2, B. Zhou (NIA/NASA-Langley), T. Albring, N. Gauger, C. Ilario, T. Economon, J.J. Alonso, L. V. Lopes, H. Yao, S. Peng, L. Davidson

1130 – 1200: Higher-order SU2: DG-FEM solver and WENO-FV solver with LES/ILES/WMLES applications, E. van der Weide (U. of Twente), J.J. Alonso, D. Drikakis, K. Singh, P. Urbaniczik, E. Molina, J.H. Choi

1200 – 1300: Lunch

1300 – 1330: Unsteady optimization with SU2: application to turbomachinery design, A. Rubino (TU Delft), M. Pini, N. Anand, P. Colonna

1330 – 1400: Preliminary results on rotor-fuselage aerodynamics using SU2: status and challenges, M. Morelli (Politecnico di Milano), G. Gori, A. Guardone

1400 – 1430: Anisotropic mesh adaptation with the INRIA AMG library, A. Loseille (INRIA), V. Menier, B. Munguia, J.J. Alonso

1430 – 1500: Coffee break

1500 – 1530: Simulation and adjoint-based design for variable density incompressible flows with heat transfer, T. Economon (Bosch)

1530 – 1600: Implementation of pressure-based Navier-Stokes for wind energy applications, A. Ravishankara (ECN part of TNO), H. Ozdemir, E. van der Weide

1600 – 1630: SU2-IDS: International Developers Society, T. Albring, R. Sanchez (TU Kaiserslautern), T. Economon, F. Palacios

1630 – 1700: Wrap up, J.J. Alonso (Stanford)

In order to participate (in-person or virtually), please register for the meeting by following the link on the SU2 home page (<https://su2code.github.io>).

\*Please note that all stated times are British Summer Time (BST). \*\*The presenter author is underlined



Stanford



TU Delft

Imperial College  
London



UNIVERSITY OF TWENTE



BOSCH