

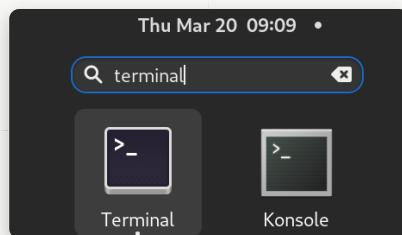
# Linux

This quickstart will help you set up your Linux machine to explore the sourcecode of Bonsai.

You will be able to update or contribute to the official documentation and also explore the code behind Bonsai's functionalities to troubleshoot or propose new features.

We will be using AlmaLinux 9 as our operating system and Visual Studio Code as our Integrated Development Environment (IDE) and we will create a dedicated user for Development.

- 1. Create Development User:** Open up a terminal (typically hitting “Windows” key and writing “terminal” in the search field)



```
sudo useradd falken10vdl  
sudo passwd falken10vdl  
sudo usermod -aG wheel falken10vdl
```

```
[alma@monster ~]$ sudo useradd falken10vdl  
[sudo] password for alma:  
[alma@monster ~]$ sudo passwd falken10vdl  
Changing password for user falken10vdl.  
New password:  
Retype new password:  
passwd: all authentication tokens updated successfully.  
[alma@monster ~]$ sudo usermod -aG wheel falken10vdl  
[alma@monster ~]$
```

## Tip

If for some reason you need to delete the user, you can use the following command:

```
sudo userdel -r falken10vdl
```

- 2. Install Blender for the created user:** We will install Blender locally in the users home directory. We must check that we are following the [Systems requirements](#).

## 4.2 LTS for Linux.

We will download the Linux 64 bit version:

<https://www.blender.org/download/release/Blender4.2/blender-4.2.8-linux-x64.tar.xz>

```
wget https://download.blender.org/release/Blender4.2/blender-4.2.8-linux-x64.tar.xz
tar -xvf blender-4.2.8-linux-x64.tar.xz
mv blender-4.2.8-linux-x64 /home/falken10vdl/.local/share/applications/blender-4.2.8
```

### ⚠ Warning

If the directory `/home/falken10vdl/.local/bin/` does not exist, we will create it.

```
mkdir -p /home/falken10vdl/.local/bin/
```

We will create a symbolic link to the blender executable in the bin directory and we will also modify the `blender.desktop` file to open in a terminal and to have a custom icon.

```
ln -s /home/falken10vdl/.local/share/applications/blender-4.2.8-linux-x64/blender /home/falken10vdl/.local/bin/blender
sed -i 's/^Terminal=.*$/Terminal=true/' /home/falken10vdl/.local/share/applications/blender.desktop
sed -i 's/^Icon=.*$/Icon=/home/falken10vdl/.local/share/applications/blender-4.2.8-li
```

```
falken10vdl@monster:~$ wget https://download.blender.org/release/Blender4.2/blender-4.2.8-linux-x64.tar.xz
--2025-03-21 00:01:06-- https://download.blender.org/release/Blender4.2/blender-4.2.8-linux-x64.tar.xz
Resolving download.blender.org (download.blender.org)... 172.67.14.163, 104.22.64.163, 104.22.65.163, ...
Connecting to download.blender.org (download.blender.org)|172.67.14.163|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 354817952 (338M) [application/octet-stream]
Saving to: 'blender-4.2.8-linux-x64.tar.xz'

blender-4.2.8-linux-x64.tar.xz      100%[=====] 338.38M   104MB/s   in 3.3s

2025-03-21 00:01:10 (103 MB/s) - 'blender-4.2.8-linux-x64.tar.xz' saved [354817952/354817952]

[falken10vdl@monster ~]$ tar -xvf blender-4.2.8-linux-x64.tar.xz
blender-4.2.8-linux-x64/
blender-4.2.8-linux-x64/readme.html
blender-4.2.8-linux-x64/lib/
blender-4.2.8-linux-x64/lib/liboslexec.so.1.13.7
blender-4.2.8-linux-x64/lib/libOpenEXRCore.so.31.3.2.4
blender-4.2.8-linux-x64/lib/libboost_locale.so.1.82.0
blender-4.2.8-linux-x64/lib/libMaterialXGenMd1.so
blender-4.2.8-linux-x64/lib/liboslcomp.so.1.13
blender-4.2.8-linux-x64/lib/libboost_regex.so
blender-4.2.8-linux-x64/lib/libOpenImageIO.so
blender-4.2.8-linux-x64/lib/libboost_atomic.so
```

```
falken10vdl@monster:~$ ln -s /home/falken10vdl/.local/share/applications/blender-4.2.8-linux-x64/blender /home/falken10vdl/.local/bin/blender
[falken10vdl@monster ~]$ sed -i 's/^Terminal=.*$/Terminal=true/' /home/falken10vdl/.local/share/applications/blender-4.2.8-linux-x64/blender.desktop
[falken10vdl@monster ~]$ sed -i 's/^Icon=.*$/Icon=/home/falken10vdl/.local/share/applications/blender-4.2.8-linux-x64/blender.svg' /home/falken10vdl/.local/share/applications/blender-4.2.8-linux-x64/blender.desktop
[falken10vdl@monster ~]$
```

*blender* in the terminal.

Now install the Bonsai Blender extension. Follow the [Unstable installation](#).

### 3. Install VSCode:

Log in as the new created user (*falken10vdl* in this example) and install [Visual Studio Code](#).

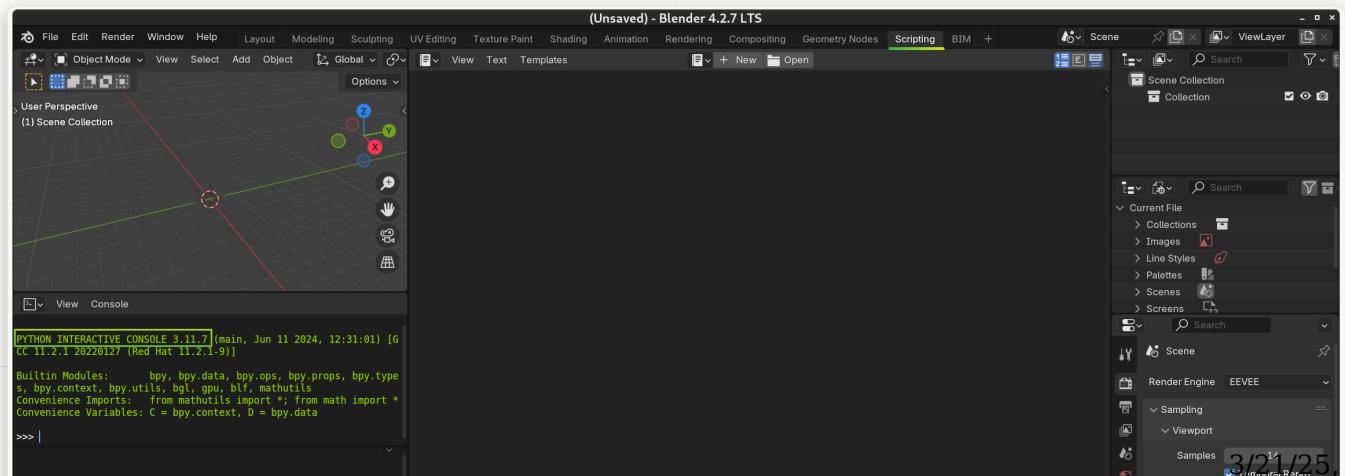
```
sudo rpm --import https://packages.microsoft.com/keys/microsoft.asc
echo -e "[code]\nname=Visual Studio Code\nbaseurl=https://packages.microsoft.com/yumrepos/vscode\nenabled=1\nautorefresh=1\ntype=rpm-md\nngpcheck=1\nngpkey=https://p
ackages.microsoft.com/keys/microsoft.asc" | sudo tee /etc/yum.repos.d/vscode.repo > /dev/null
dnf check-update
sudo dnf install code # or code-insiders
```

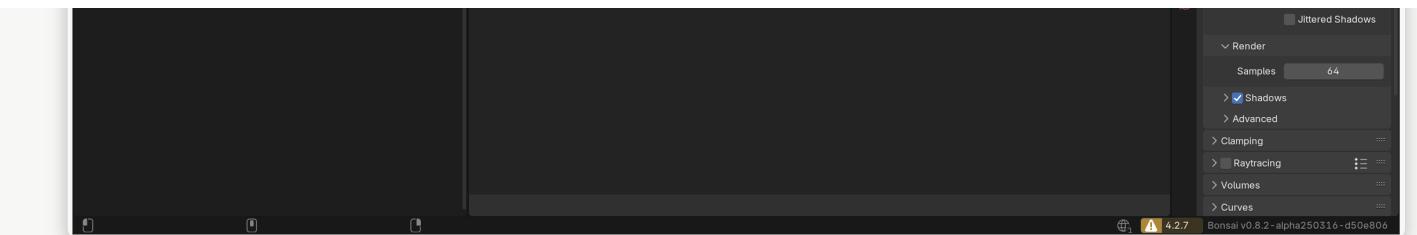
```
falken10vdl@monster:~$ sudo rpm --import https://packages.microsoft.com/keys/microsoft.asc
[falken10vdl@monster ~]$ echo -e "[code]\nname=Visual Studio Code\nbaseurl=https://packages.microsoft.com/yumrepos/vscode\nenabled=1\nautorefresh=1\ntype=rpm-md\nngpcheck=1\nngpkey=https://p
ackages.microsoft.com/keys/microsoft.asc" | sudo tee /etc/yum.repos.d/vscode.repo > /dev/null
[falken10vdl@monster ~]$ dnf check-update
Visual Studio Code
[falken10vdl@monster ~]$ sudo dnf install code
Visual Studio Code
Dependencies resolved.
=====
| Package           | Architecture | Version      | Repository | Size   |
| ======           | ======       | ======       | ======     | ====== |
| Installing:     | code          | x86_64       | code        | 142 M  |
| Transaction Summary |           |               |             |         |
| Install 1 Package |           |               |             |         |
=====
Total download size: 142 M
Installed size: 400 M
Is this ok [y/N]: y
Downloading Packages:
code-1.98.2-1741788968.el8.x86_64.rpm
Total
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing : 1/1
  Installing : code-1.98.2-1741788968.el8.x86_64 1/1
  Running scriptlet: code-1.98.2-1741788968.el8.x86_64 1/1
  Verifying   : code-1.98.2-1741788968.el8.x86_64 1/1
Installed:
  code-1.98.2-1741788968.el8.x86_64
Complete!
[falken10vdl@monster ~]$
```

### 4. Adjust Python version in VSCode as in Blender:

This is a good practice step to ensure that the Python version in VSCode matches the one in Blender.

Check the Python version in Blender by going to [Scripting](#). In the Python Console you can see the version number of the Python interpreter





In our case it is version 3.11.7

We will need to install the closest version in our Linux machine.

We check in [Python Downloads](#).

Python version	Maintenance status	First released	End of support	Release schedule
3.14	pre-release	2025-10-01 (planned)	2030-10	PEP 745
3.13	bugfix	2024-10-07	2029-10	PEP 719
3.12	bugfix	2023-10-02	2028-10	PEP 693
3.11	security	2022-10-24	2027-10	PEP 664
3.10	security	2021-10-04	2026-10	PEP 619
3.9	security	2020-10-05	2025-10	PEP 596
3.8	end of life, last release was 3.8.20	2019-10-14	2024-10-07	PEP 569

Looking for a specific release?

Python releases by version number:

Release version	Release date	Click for more
<a href="#">Python 3.13.1</a>	Dec. 3, 2024	<a href="#">Download</a> Release Notes
<a href="#">Python 3.11.11</a>	Dec. 3, 2024	<a href="#">Download</a> Release Notes
<a href="#">Python 3.10.16</a>	Dec. 3, 2024	<a href="#">Download</a> Release Notes
<a href="#">Python 3.9.21</a>	Dec. 3, 2024	<a href="#">Download</a> Release Notes
<a href="#">Python 3.13.0</a>	Oct. 7, 2024	<a href="#">Download</a> Release Notes
<a href="#">Python 3.12.7</a>	Oct. 1, 2024	<a href="#">Download</a> Release Notes
<a href="#">Python 3.11.10</a>	Sept. 7, 2024	<a href="#">Download</a> Release Notes

[View older releases](#)

The closest version is 3.11.11. So we download the Gzipped source tarball and install it.

We use the “altinstall” option to avoid overwriting the default Python version which could cause conflicts with the default installed version of the linux operating system.

```
wget https://www.python.org/ftp/python/3.11.11/Python-3.11.11.tgz
tar -xvf Python-3.11.11.tgz
cd Python-3.11.11
sudo dnf install gcc openssl-devel bzip2-devel libffi-devel
./configure --enable-optimizations
nproc
make -j 4 #adjust the value to the one provided by nproc
sudo make altinstall
```

```
falken10vdl@monster:~/python/Python-3.11.11
[falken10vdl@monster ~]$ mkdir python
[falken10vdl@monster ~]$ cd python/
[falken10vdl@monster python]$ wget https://www.python.org/ftp/python/3.11.11/Python-3.11.11.tgz
--2025-03-20 17:15:35-- https://www.python.org/ftp/python/3.11.11/Python-3.11.11.tgz
Resolving www.python.org (www.python.org)... 151.101.128.223, 151.101.192.223, 151.101.0.223, ...
Connecting to www.python.org (www.python.org)|151.101.128.223|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 26542994 (25M) [application/octet-stream]
Saving to: 'Python-3.11.11.tgz'

Python-3.11.11.tgz          100%[=====] 25.31M  104MB/s   in 0.2s

2025-03-20 17:15:35 (104 MB/s) - 'Python-3.11.11.tgz' saved [26542994/26542994]

[falken10vdl@monster python]$ tar -xvf Python-3.11.11.tgz
Python-3.11.11/
Python-3.11.11/.editorconfig
Python-3.11.11/.mailmap
Python-3.11.11/.pre-commit-config.yaml
Python-3.11.11/.readthedocs.yaml
Python-3.11.11/Doc/
Python-3.11.11/Doc/Makefile
Python-3.11.11/Doc/README.rst
Python-3.11.11/Doc/_static/
```

```
falken10vdl@monster:~/python/Python-3.11.11
Python-3.11.11/configure.ac
Python-3.11.11/install-sh
Python-3.11.11/pyconfig.h.in
Python-3.11.11/setup.py
[falken10vdl@monster python]$ cd Python-3.11.11/
[falken10vdl@monster Python-3.11.11]$ sudo dnf install gcc openssl-devel bzip2-devel libffi-devel
[sudo] password for falken10vdl:
github_github-lfs
github_github-lfs-source
Package gcc-11.5.0-5.el9_5.alma1.x86_64 is already installed.
Package openssl-devel-1:3.2.2-6.el9_5_1.x86_64 is already installed.
Package bzip2-devel-1.0.8-10.el9_5.x86_64 is already installed.
Package libffi-devel-3.4.2-8.el9.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[falken10vdl@monster Python-3.11.11]$ ./configure --enable-optimizations
checking build system type... x86_64-pc-linux-gnu
checking host system type... x86_64-pc-linux-gnu
checking for Python interpreter freezing... ./bootstrap_python
checking for python3.11... python3.11
checking Python for regen version... Python 3.11.1
checking for pkg-config... /usr/bin/pkg-config
checking pkg-config is at least version 0.9.0... yes
```

```
falken10vdl@monster:~/python/Python-3.11.11
.....
config:status: creating Makefile.pre
config:status: creating Misc/python.pc
config:status: creating Misc/python-embed.pc
config:status: creating Misc/python-config.sh
config:status: creating Modules/Setup.bootstrap
config:status: creating Modules/Setup.stdlib
config:status: creating Modules/_d_so_aix
config:status: creating pyconfig.h
configure: creating Modules/Setup.local
configure: creating Makefile
[falken10vdl@monster Python-3.11.11]$ nproc
16
[falken10vdl@monster Python-3.11.11]$ make -j 16
Running code to generate profile data (this can take a while):
# First, we need to create a clean build with profile generation
# enabled.
make profile-gen-stamp
make[1]: Entering directory '/home/falken10vdl/python/Python-3.11.11'
make clean
make[2]: Entering directory '/home/falken10vdl/python/Python-3.11.11'
find . -depth -name '__pycache__' -exec rm -rf {} ;
find . -name '*.py[co]' -exec rm -f {} ;
find . -name '*.o[a]' -exec rm -f {} ;
find . -name '*.s[ol]' -exec rm -f {} ;
```

```
falken10vdl@monster:~/python/Python-3.11.11
renaming build/scripts-3.11/pydoc3 to build/scripts-3.11/pydoc3.11
renaming build/scripts-3.11/idle3 to build/scripts-3.11/idle3.11
renaming build/scripts-3.11/2to3 to build/scripts-3.11/2to3-3.11
make[1]: leaving directory '/home/falken10vdl/python/Python-3.11.11'
[falken10vdl@monster Python-3.11.11]$ sudo make altinstall
if test "no-framework" = "no-framework" ; then \
    /usr/bin/install -c python /usr/local/bin/python3.11; \
else \
    /usr/bin/install -c -s Mac/pythonw /usr/local/bin/python3.11; \
fi
if test "3.11" != "3.11" ; then \
    if test -f /usr/local/bin/python3.11 -o -h /usr/local/bin/python3.11; \
    then rm -f /usr/local/bin/python3.11; \
    fi; \
    (cd /usr/local/bin; ln python3.11 python3.11); \
fi
if test "x" != "x" ; then \
    rm -f /usr/local/bin/python3.11-32; \
    lipo \
        -output /usr/local/bin/python3.11-32 \
        /usr/local/bin/python3.11; \
fi
if test "x" != "x" ; then \
    rm -f /usr/local/bin/python3.11-intel64; \

```

```
falken10vdl@monster:~/python/Python-3.11.11
copying build/scripts-3.11/pydoc3.11 -> /usr/local/bin
copying build/scripts-3.11/idle3.11 -> /usr/local/bin
copying build/scripts-3.11/2to3-3.11 -> /usr/local/bin
changing mode of /usr/local/bin/pydoc3.11 to 755
changing mode of /usr/local/bin/idle3.11 to 755
changing mode of /usr/local/bin/2to3-3.11 to 755
rm /usr/local/lib/python3.11/lib-dynload/_sysconfigdata__linux_x86_64-linux-gnu.py
rm -r /usr/local/lib/python3.11/lib-dynload/_pycache_-
/usr/bin/install -c -m 644 ./Misc/python.man \
```

```

/usr/local/share/man/man1/python3.11.1
if test "$upgrade" != "xno" ; then \
    case upgrade in \
        upgrade) ensurepip="--altinstall --upgrade" ;; \
        install|*) ensurepip="--altinstall" ;; \
    esac; \
    ./python -E -m ensurepip \
        $ensurepip --root=/ ; \
fi
Looking in links: /tmp/tmpisfl8chc
Requirement already satisfied: setuptools in /usr/local/lib/python3.11/site-packages (65.5.0)
Requirement already satisfied: pip in /usr/local/lib/python3.11/site-packages (24.0)
WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It is recommended to use a virtual environment instead: http://pip.pypa.io/warnings/venv/
[falken10vdl@monster Python-3.11.11]$ 

```

After this, we have the 3.11 python version installed in our machine. It is reachable by typing `python3.11` in the terminal.

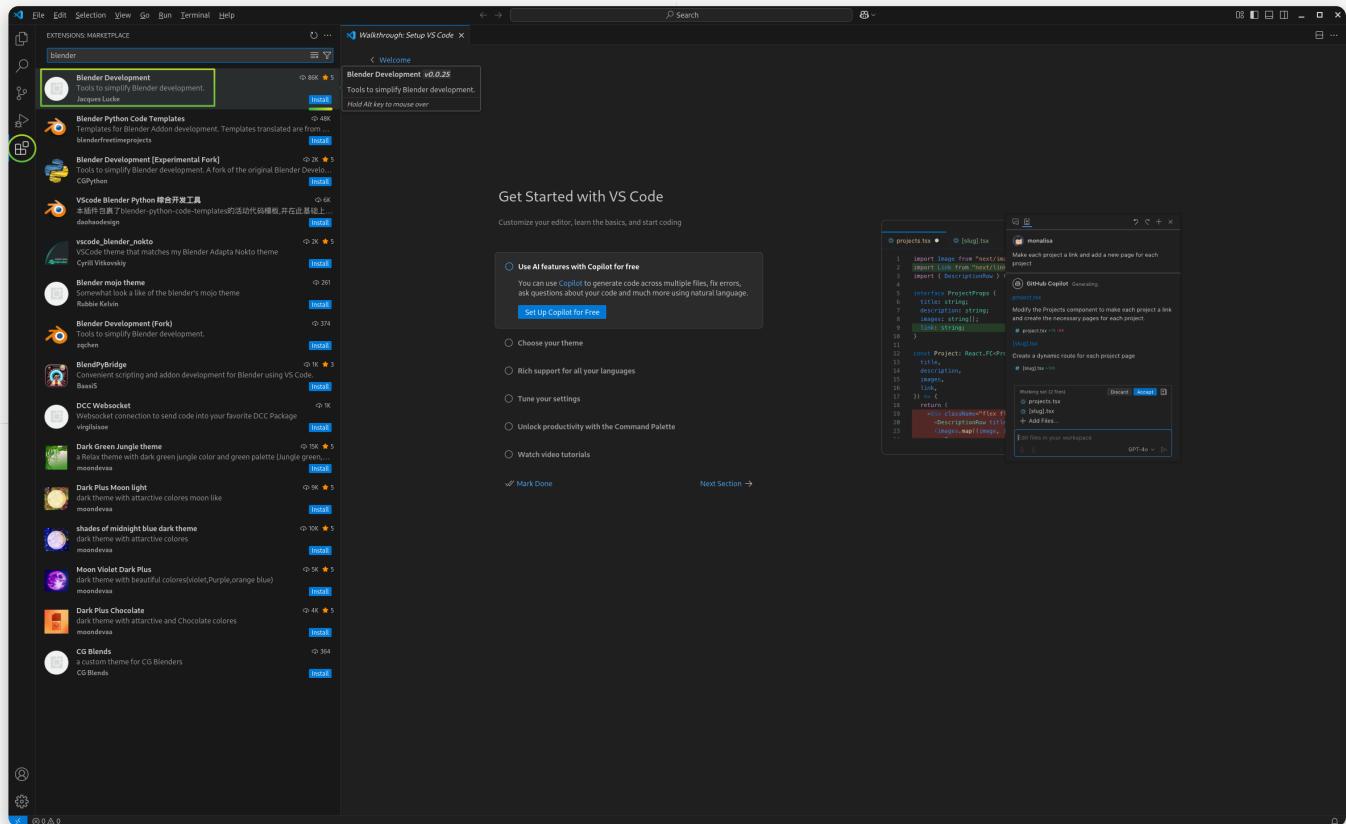
```
python3.11 -V
```

```

falken10vdl@monster:~/python/Python-3.11.11$ python3.11 -V
Python 3.11.11
[falken10vdl@monster Python-3.11.11]$ 

```

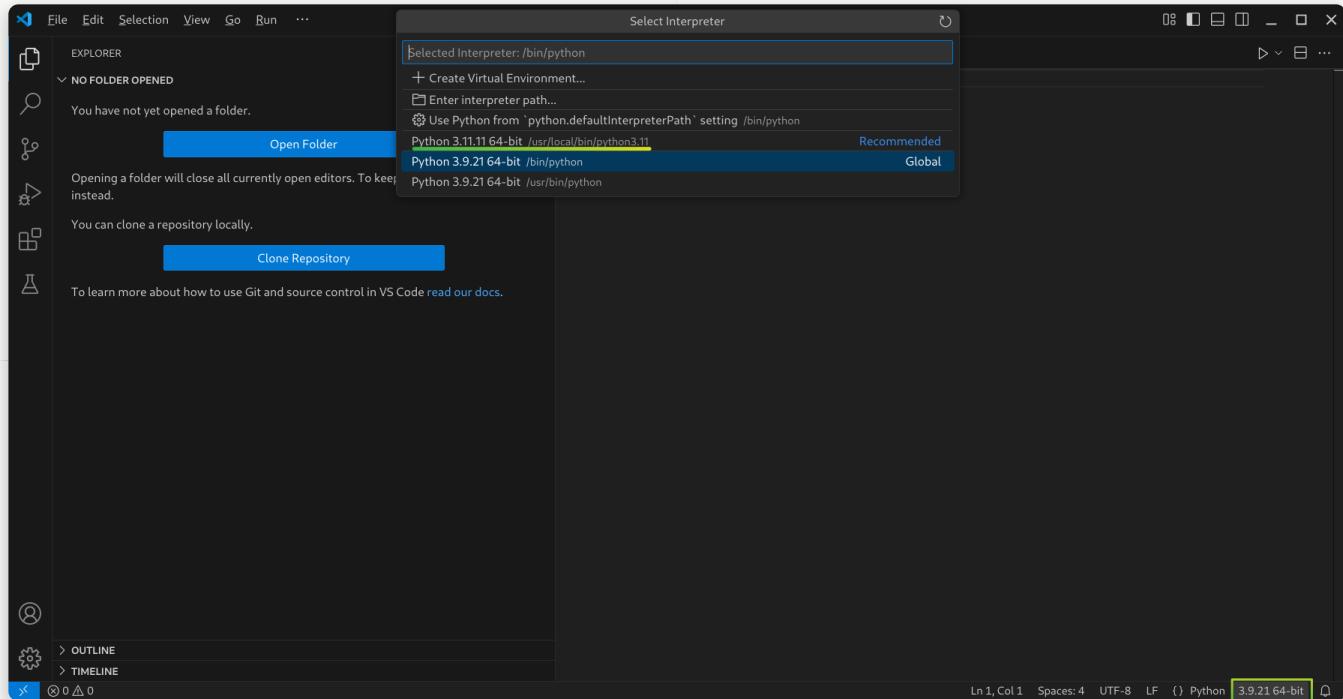
Launch VSCode and go to the Extensions tab, search for Blender Development and install it.



This will also install some Python related extensions.

Finally create a sample python file and check the Python interpreter version in the bottom left corner.

[File ▶ New File... ▶ Python File](#)



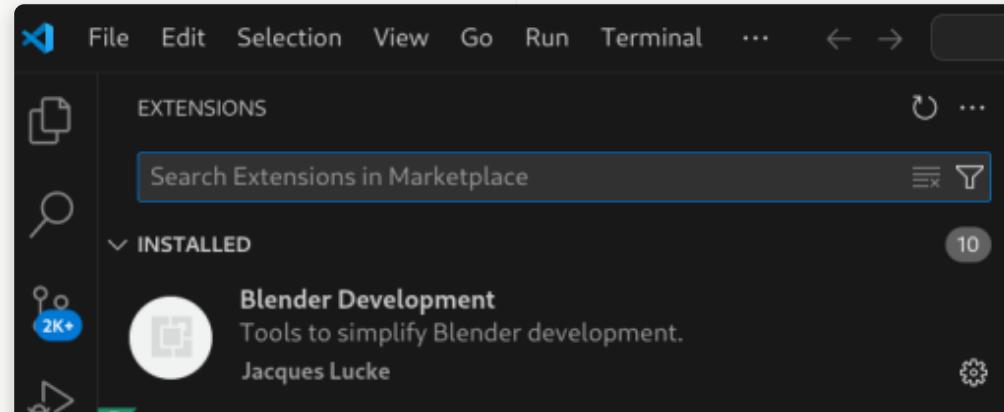
Congratulations! You have now a Python version in VSCode similar to the one run by Blender.

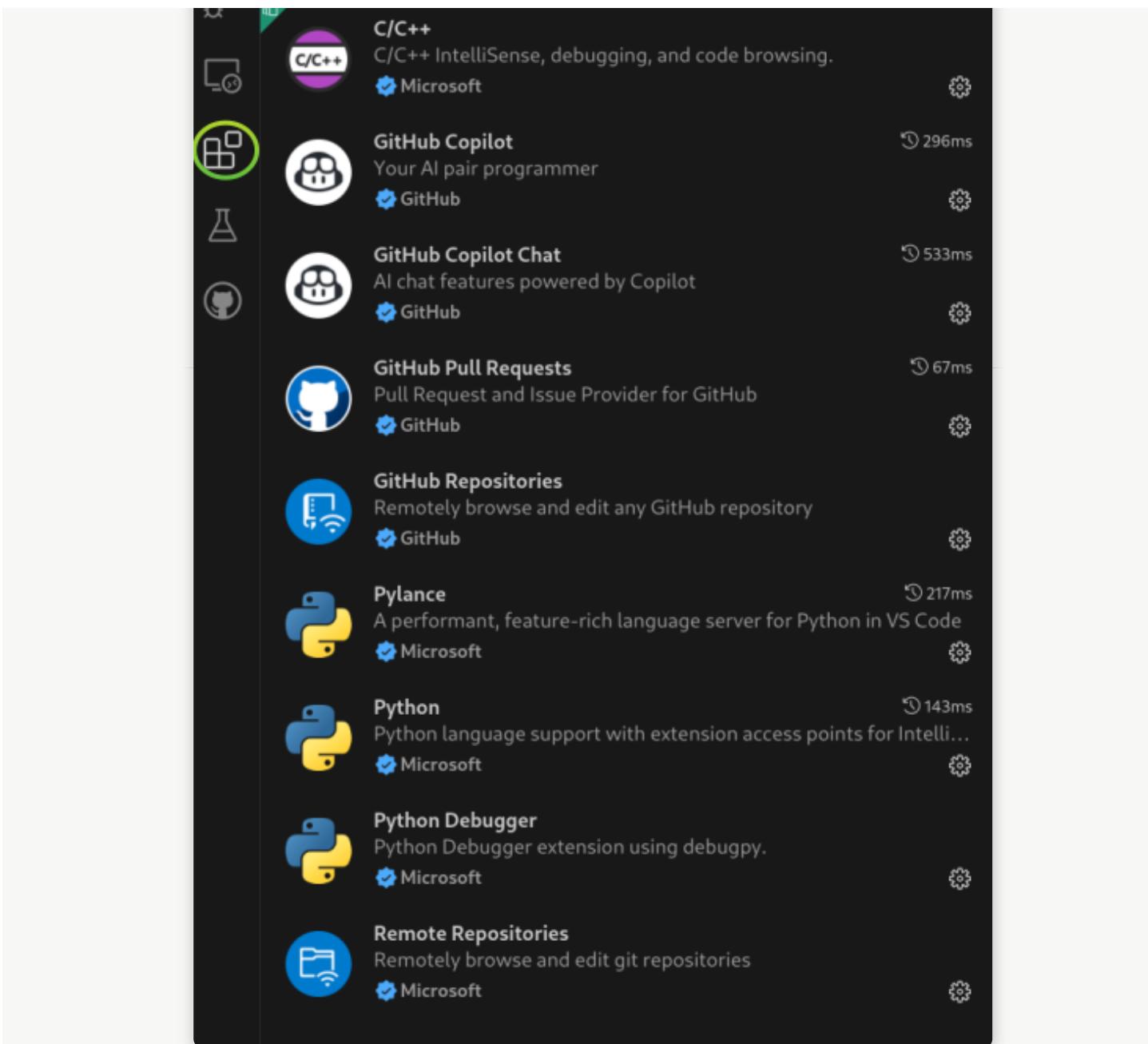
**5. Install GitHub related VSCode extensions:** To facilitate the use of git commands and pulling and pushing files from a local repository towards github, please install as well the following VSCode extensions:

- GitHub Pull Requests
- GitHub Repositories
- Remote Repositories

Optionaly you can also install Copilot extensions

- GitHub Copilot
- GitHub Copilot Chat





6. Fork IfcOpenShell project from GitHub: For this step you will need an account on GitHub.

Once you have a registered account you can find it under <https://github.com/YOURGITHUBUSERID> In the example for *falken10vdl* the link is <https://github.com/falken10vdl>

The screenshot shows the GitHub profile page for the user `falken10vdl`. The profile picture is a large, stylized letter 'H' composed of pink squares. The user has 1 achievement. The profile bar shows the following statistics:

- overview
- Repositories 1
- Projects
- Packages
- Stars 1

A message box at the top right says: "You unlocked new Achievements with private contributions! Show them off by including private contributions in your Profile in settings." Below the profile bar, there's a section for "Popular repositories" featuring the repository `Spoon-Knife`, which is forked from `octocat/Spoon-Knife` and is public. At the bottom right, there's a timestamp: 3/21/25, 18:00.

falken10vdl 25 contributions in the last year Contribution settings 2025

Go to the [IfcOpenShell GitHub page](#). And click on the Fork button. Please make sure that you are logged with your GitHub account as shown in the top right corner of the page.

IfcOpenShell / IfcOpenShell

**Fork 766** (highlighted)

**Create a new fork**

v0.8.0 74 Branches 1823 Tags

aothms Apply skew in infra lofts #6386

.github Update publish-pyodide-demo-app.yml 8 hours ago

aws/lambda migrate docs urls 11 months ago

choco/bonsai bonsaibim urls #5178 7 months ago

cmake Don't allow empty sha for add\_commit\_sha 2 months ago

conda bonsaibim urls #5178 7 months ago

docs docs: include doxygen-awesome as git submodule 11 months ago

nix Update build-all.py; --force when fetch tags 3 weeks ago

pyodide wasm wheel fixes 2 months ago

17,500 Commits

README and geometry engine

Readme

LGPL-3.0, GPL-3.0 licenses found

Activity

Custom properties

2k stars

91 watching

766 forks

Report repository

Releases 1,877

bonsai-0.8.2-alpha2503201130 ... (Latest)

Once the fork is generated you will be redirected to your own fork of the IfcOpenShell project.

falken10vdl / IfcOpenShell

forked from IfcOpenShell/IfcOpenShell

v0.8.0 1 Branch 0 Tags

This branch is up to date with IfcOpenShell/IfcOpenShell:v0.8.0 .

aothms Apply skew in infra lofts IfcOpenShell#6386

.github Update publish-pyodide-demo-app.yml 8 hours ago

aws/lambda migrate docs urls 11 months ago

choco/bonsai bonsaibim urls IfcOpenShell#5178 7 months ago

17,500 Commits

About

Open source IFC library and geometry engine

Readme

LGPL-3.0 license

Activity

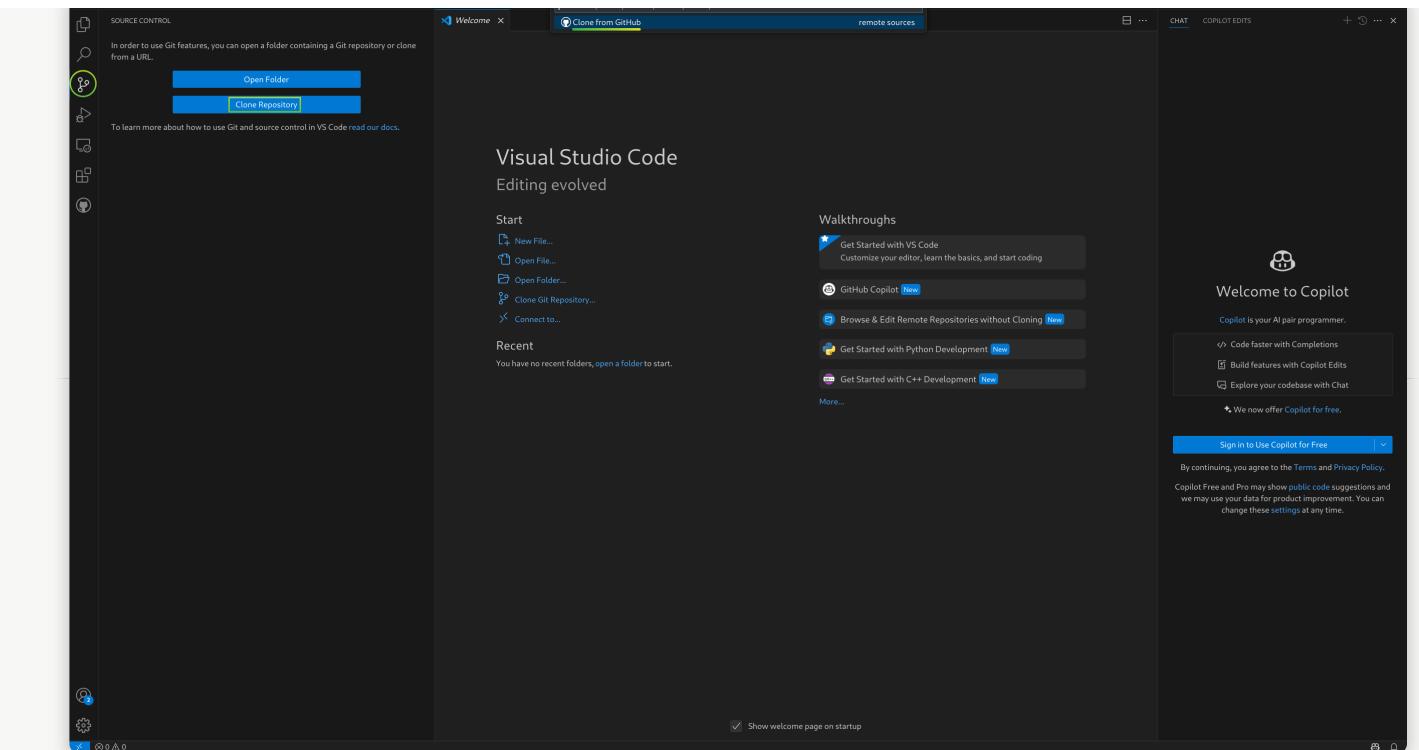
0 stars

0 watching

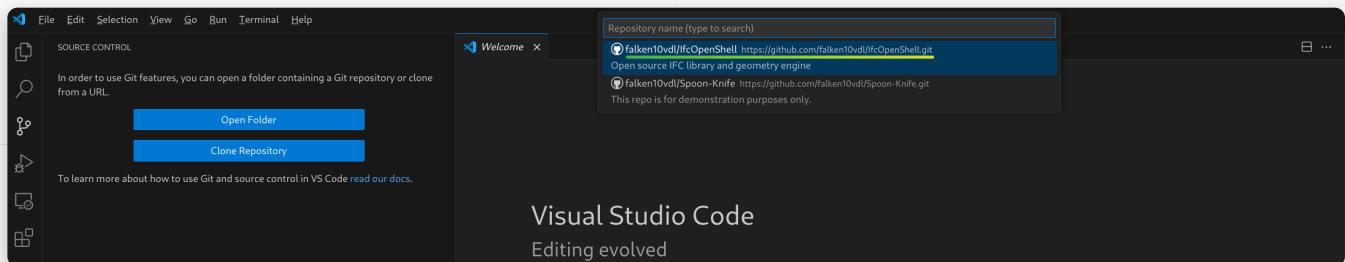
0 forks

Now we will clone the forked repository to our local machine.

**7. Cloning bonsai to our development environment:** Launch VSCode Select the Source Control tool. Then [Clone repository](#) and then select “Clone from GitHub”.



A series of steps will be required to authenticate with GitHub. You will need to provide your GitHub credentials. Once VSCode has authenticated yourself in GitHub, you will be able to select the repository you want to clone. In this case we will clone the IfcOpenShell repository.



VSCode will ask you to select a folder where the repository will be cloned. and it will start the cloning process.

Once finished, you will see the repository in the Explorer tool.



that establishes links from the unstable-installation to the cloned repository so we can easily see the changes done in the cloned repository taken effect when we load blender locally.

### Download dev\_environment.sh

Edit the file to match the paths in your system. In our case we will edit the following lines:

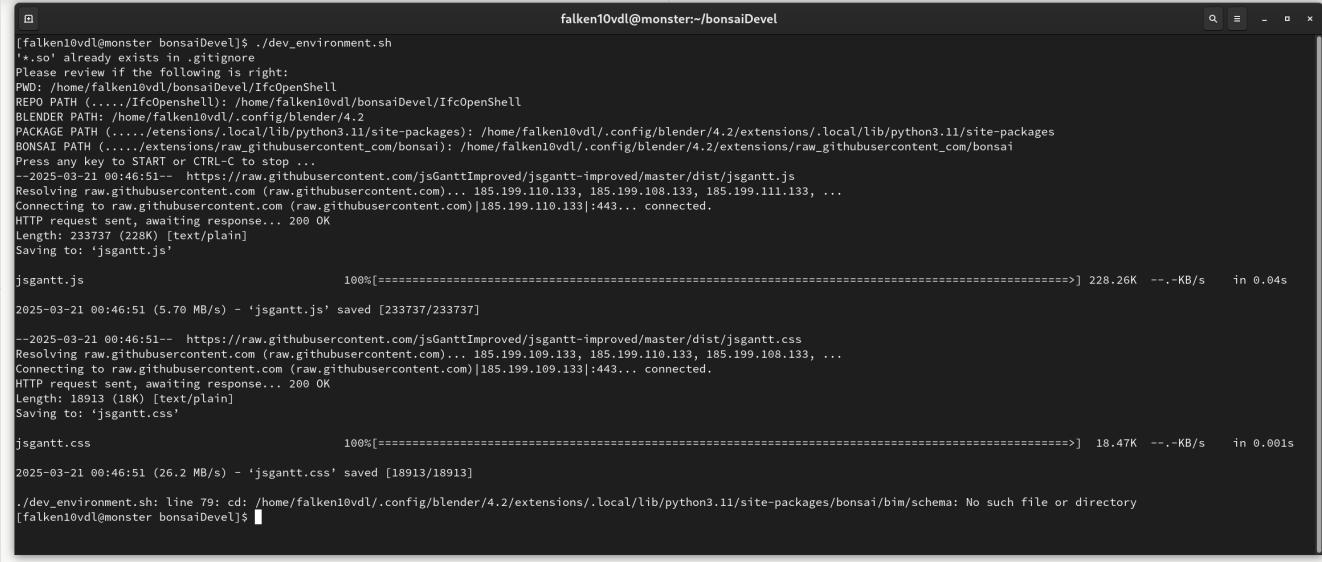
- REPO\_PATH="\$HOME/bonsaiDevel/IfcOpenShell"
- BLENDER\_PATH="\$HOME/config/blender/4.2"
- PACKAGE\_PATH="\${BLENDER\_PATH}/extensions/.local/lib/python3.11/site-packages"
- BONSAI\_PATH="\${BLENDER\_PATH}/extensions/raw\_githubusercontent\_com/bonsai"

We execute the script in the terminal. Confirm the data and the script will create the necessary links.

```
./dev_environment.sh
```



```
falken10vdl@monster bonsaiDevel$ ls
dev_environment.sh  IfcOpenShell
[falken10vdl@monster bonsaiDevel]$ ./dev_environment.sh
Added '*.so' to .gitignore
Please review if the following is right:
PWD: /home/falken10vdl/bonsaiDevel/IfcOpenShell
REPO PATH (..../IfcOpenShell): /home/falken10vdl/bonsaiDevel/IfcOpenShell
BLENDER PATH: /home/falken10vdl/.config/blender/4.2
PACKAGE PATH (..../extensions/.local/lib/python3.11/site-packages): /home/falken10vdl/.config/blender/4.2/extensions/.local/lib/python3.11/site-packages
BONSAI PATH (..../extensions/raw_githubusercontent_com/bonsai): /home/falken10vdl/.config/blender/4.2/extensions/raw_githubusercontent_com/bonsai
Press any key to START or CTRL-C to stop ...
```



```
falken10vdl@monster bonsaiDevel$ ./dev_environment.sh
'*.*' already exists in .gitignore
Please review if the following is right:
PWD: /home/falken10vdl/bonsaiDevel/IfcOpenShell
REPO PATH (..../IfcOpenShell): /home/falken10vdl/bonsaiDevel/IfcOpenShell
BLENDER PATH: /home/falken10vdl/.config/blender/4.2
PACKAGE PATH (..../extensions/.local/lib/python3.11/site-packages): /home/falken10vdl/.config/blender/4.2/extensions/.local/lib/python3.11/site-packages
BONSAI PATH (..../extensions/raw_githubusercontent_com/bonsai): /home/falken10vdl/.config/blender/4.2/extensions/raw_githubusercontent_com/bonsai
Press any key to START or CTRL-C to stop ...
--2025-03-21 00:46:51-- https://raw.githubusercontent.com/jsganttImproved/jsgantt-improved/master/dist/jsgantt.js
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 185.199.110.133, 185.199.108.133, 185.199.111.133, ...
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|185.199.110.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 233737 (228K) [text/plain]
Saving to: 'jsgantt.js'

jsgantt.js          100%[=====] 228.26K --.-KB/s   in 0.04s

2025-03-21 00:46:51 (5.70 MB/s) - 'jsgantt.js' saved [233737/233737]

--2025-03-21 00:46:51-- https://raw.githubusercontent.com/jsganttImproved/jsgantt-improved/master/dist/jsgantt.css
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 185.199.109.133, 185.199.110.133, 185.199.108.133, ...
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|185.199.109.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 18913 (18K) [text/plain]
Saving to: 'jsgantt.css'

jsgantt.css         100%[=====] 18.47K --.-KB/s   in 0.001s

2025-03-21 00:46:51 (26.2 MB/s) - 'jsgantt.css' saved [18913/18913]

./dev_environment.sh: line 79: cd: /home/falken10vdl/.config/blender/4.2/extensions/.local/lib/python3.11/site-packages/bonsai/bim/schema: No such file or directory
[falken10vdl@monster bonsaiDevel]$
```

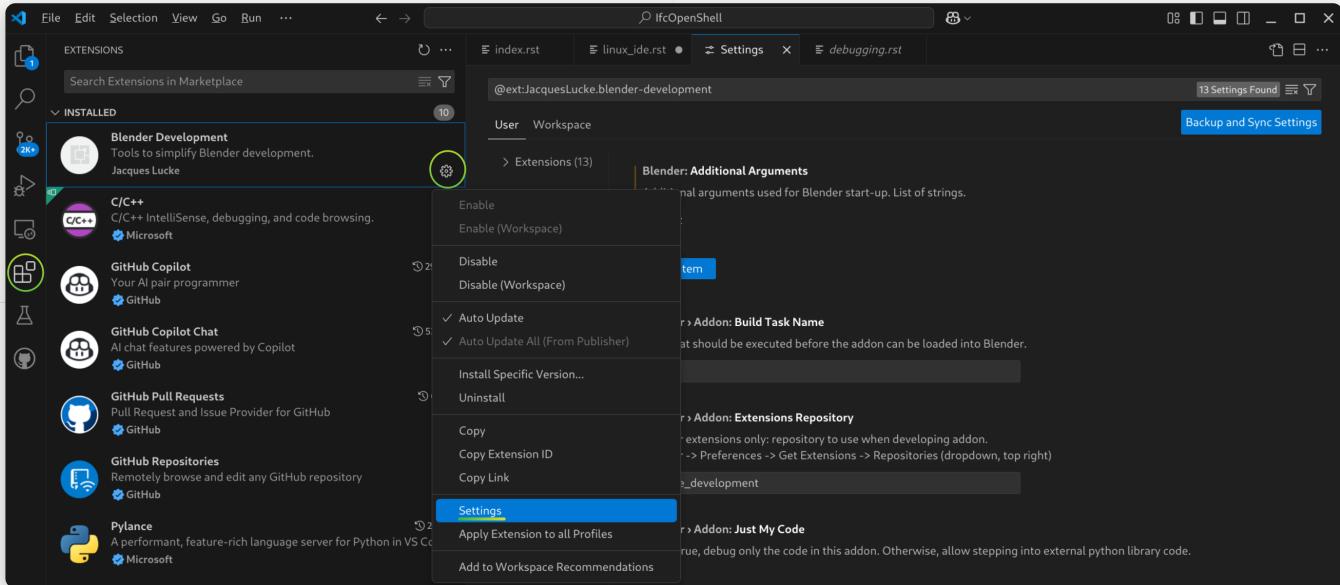
#### Warning

If you receive an error like this:

```
cp: cannot stat '/home/falken10vdl/.config/blender/4.2/extensions/.local/lib/python3.11/site-package
```

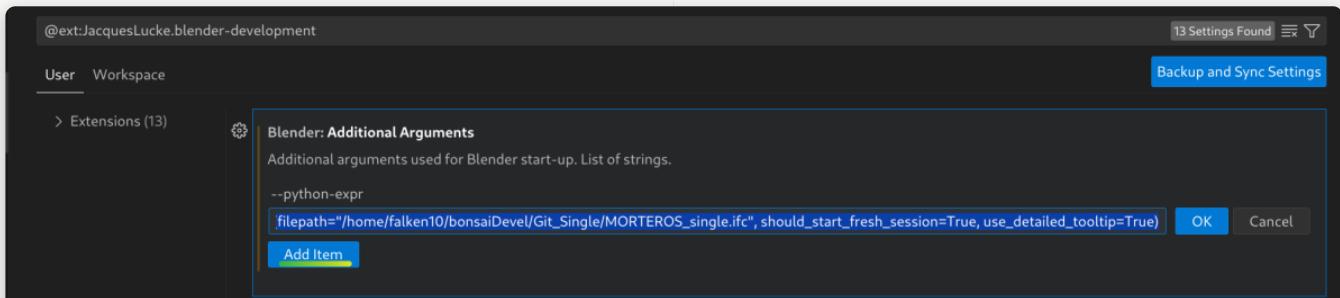
It means that you have not installed the Bonsai Blender extension. Please refer to the last part of point 2. above and follow the [Unstable installation](#).

**9. Adjustments to the VSCode Blender extension:** We will now make some adjustments to the VSCode Blender extension to ease the reload of the addon. Select the Extensions tool. Then [Blender Development](#) and then select [Settings](#).

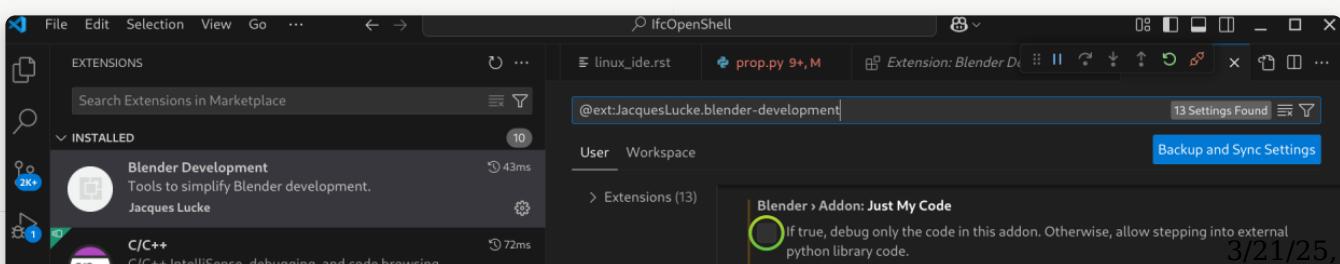


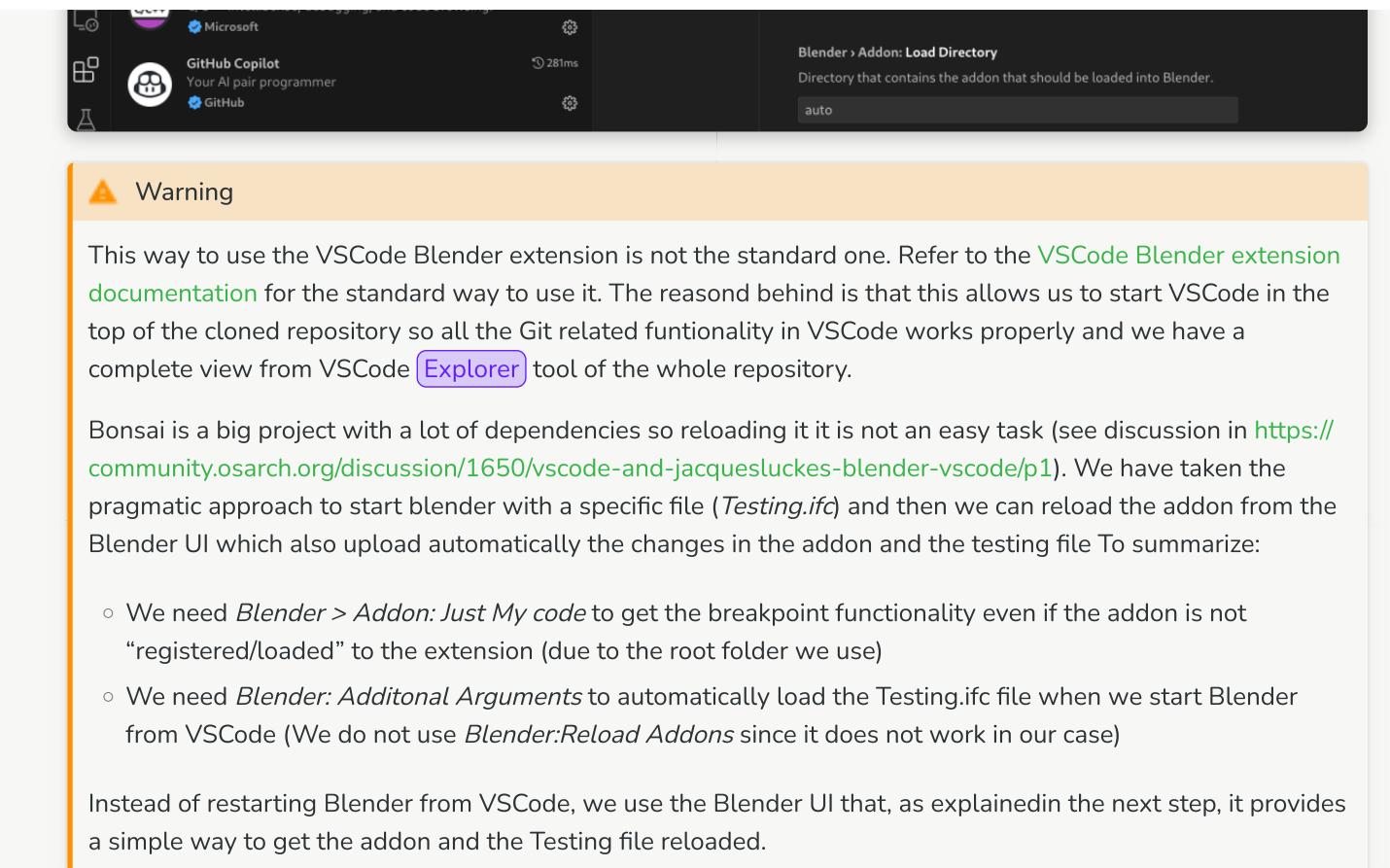
Click twice in “Add Item” within the *Blender: Additional Arguments* section and add the following two items (adapt *Testing.ifc* to the name of the IFC file you want to test during Bonsai development):

- `--python Expr`
- `import bpy; bpy.ops.bim.load_project(filepath="/home/falken10/vdl/bonsaiDevel/Testing.ifc", should_start_fresh_session=True, use_detailed_tooltip=True)`



Make sure that *Blender > Addon: Just My code* is not selected (This allows to set the breakpoints anywhere in the source code).





The screenshot shows the VSCode interface with the Blender extension installed. In the top right, there's a settings editor for 'Blender > Addon: Load Directory'. The 'Directory' field is set to 'auto'. Below this, a yellow warning box contains text about using the extension in a cloned repository. It points to the [VSCode Blender extension documentation](#) for the standard way. The warning notes that this method allows starting VSCode in the repository root to keep Git functionality working and provides a complete view of the repository through the Explorer tool.

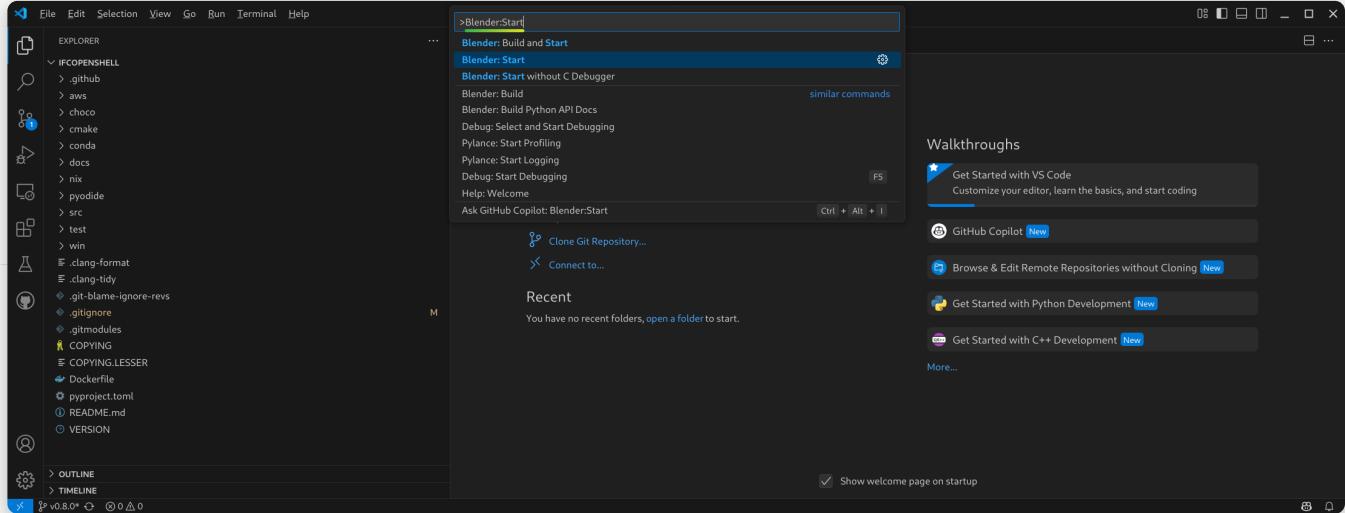
This way to use the VSCode Blender extension is not the standard one. Refer to the [VSCode Blender extension documentation](#) for the standard way to use it. The reason behind is that this allows us to start VSCode in the top of the cloned repository so all the Git related functionality in VSCode works properly and we have a complete view from VSCode ([Explorer](#)) tool of the whole repository.

Bonsai is a big project with a lot of dependencies so reloading it is not an easy task (see discussion in <https://community.osarch.org/discussion/1650/vscode-and-jacquesluckes-blender-vscode/p1>). We have taken the pragmatic approach to start blender with a specific file (*Testing.ifc*) and then we can reload the addon from the Blender UI which also upload automatically the changes in the addon and the testing file To summarize:

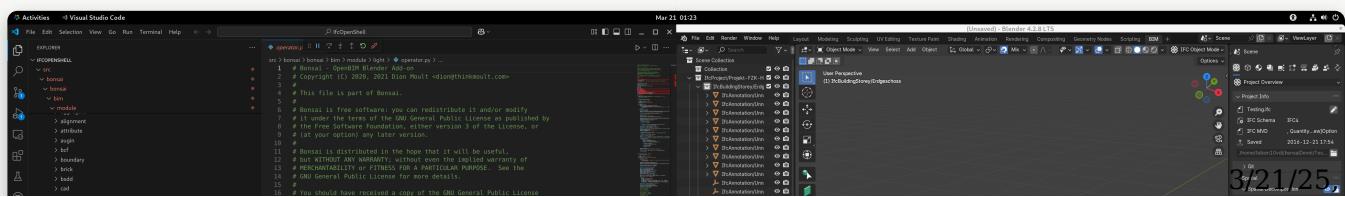
- We need *Blender > Addon: Just My code* to get the breakpoint functionality even if the addon is not “registered/loaded” to the extension (due to the root folder we use)
- We need *Blender: Additional Arguments* to automatically load the *Testing.ifc* file when we start Blender from VSCode (We do not use *Blender:Reload Addons* since it does not work in our case)

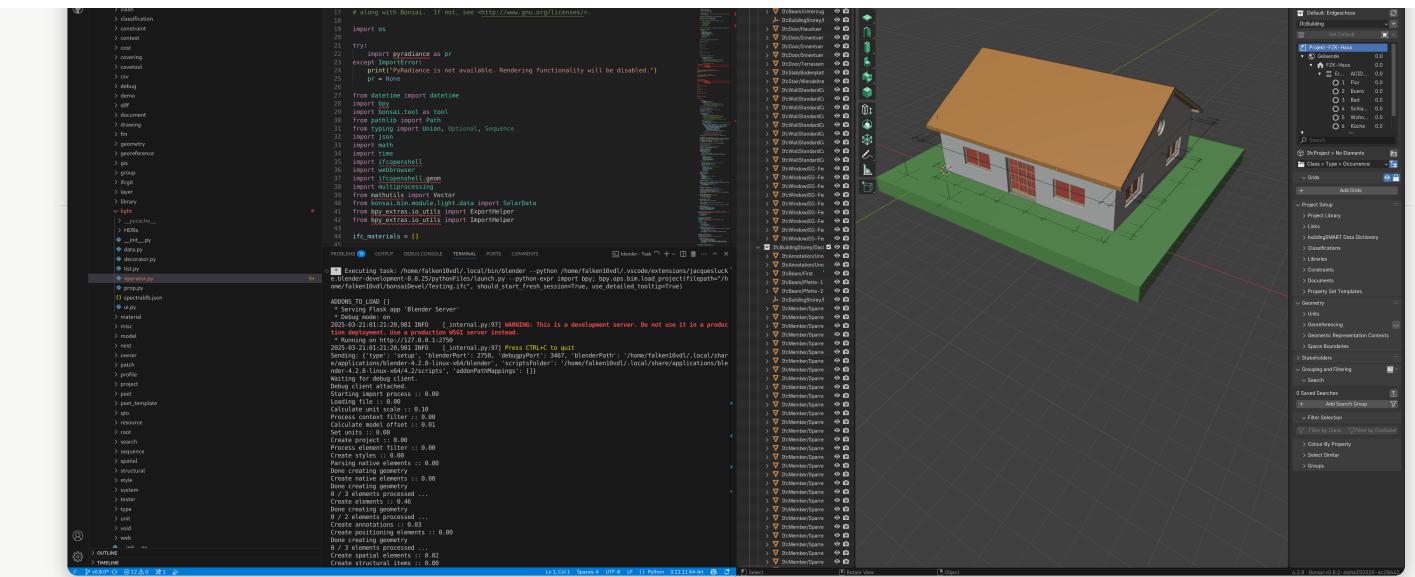
Instead of restarting Blender from VSCode, we use the Blender UI that, as explained in the next step, it provides a simple way to get the addon and the Testing file reloaded.

**10. Launch blender from VSCode:** We are now ready to launch Blender from VSCode. Open VSCode. Open the cloned repository if not already open. Press CTRL-SHIFT-P and type “Blender: Start”.

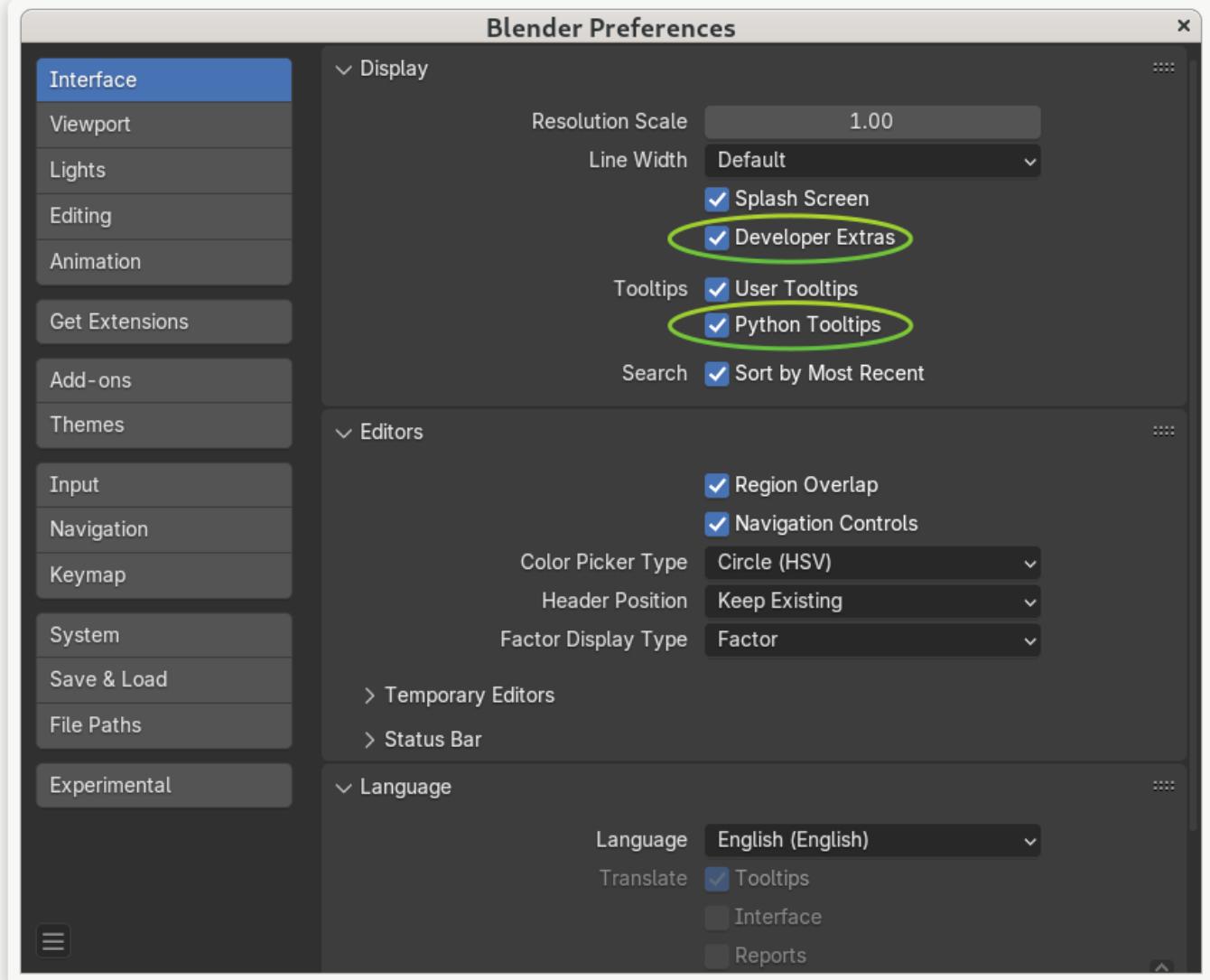


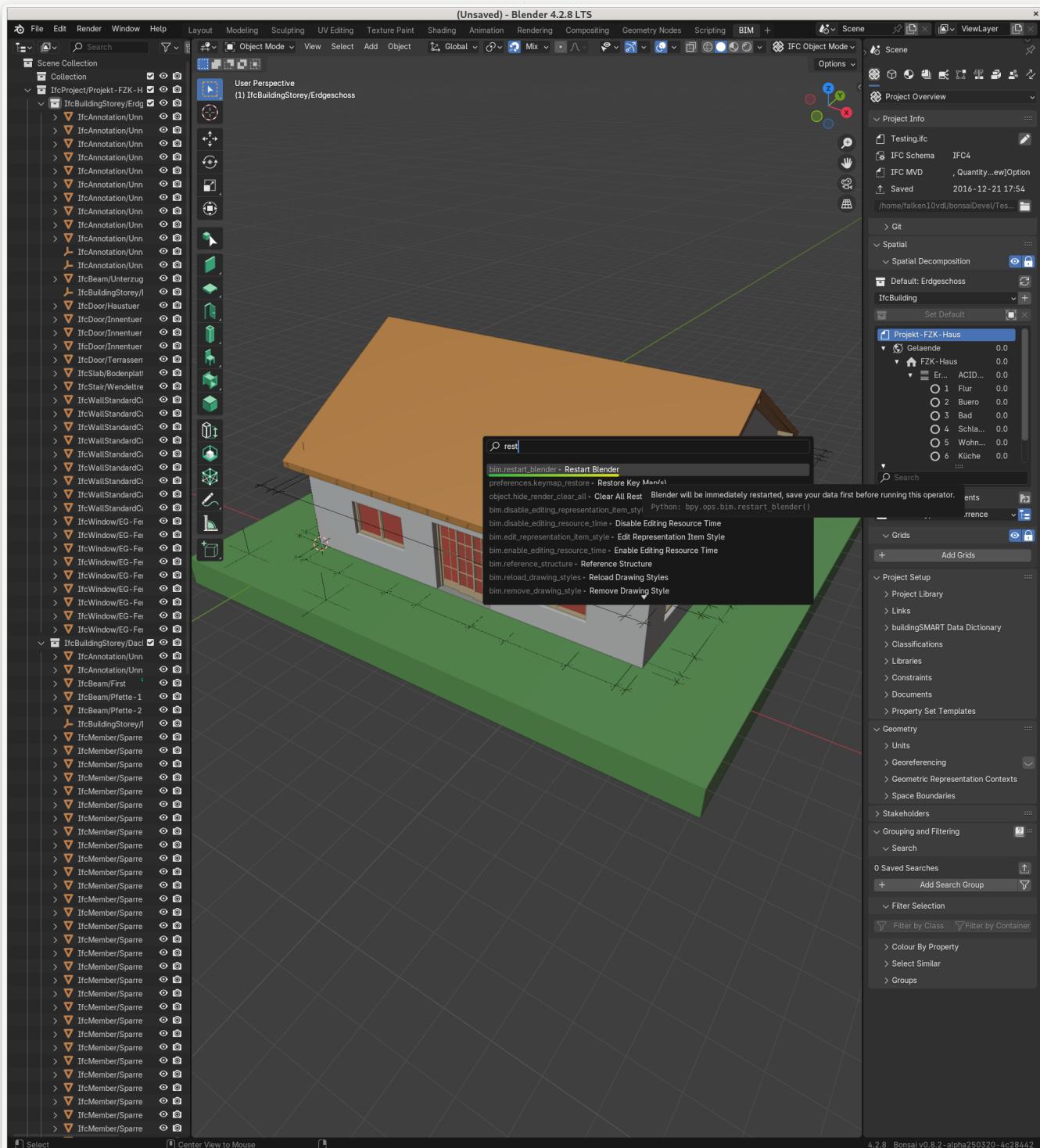
Blender will start loading the *Testing.ifc* file. You can now start exploring the code and make changes to the addon!





In order to be able to restart blender (and reload the addons + reload teh Testing file) we need to enable “Developer Extras” and also a good practice is to enable “Python Tooltips” in [Edit ▶ Preferences ▶ Interface](#).



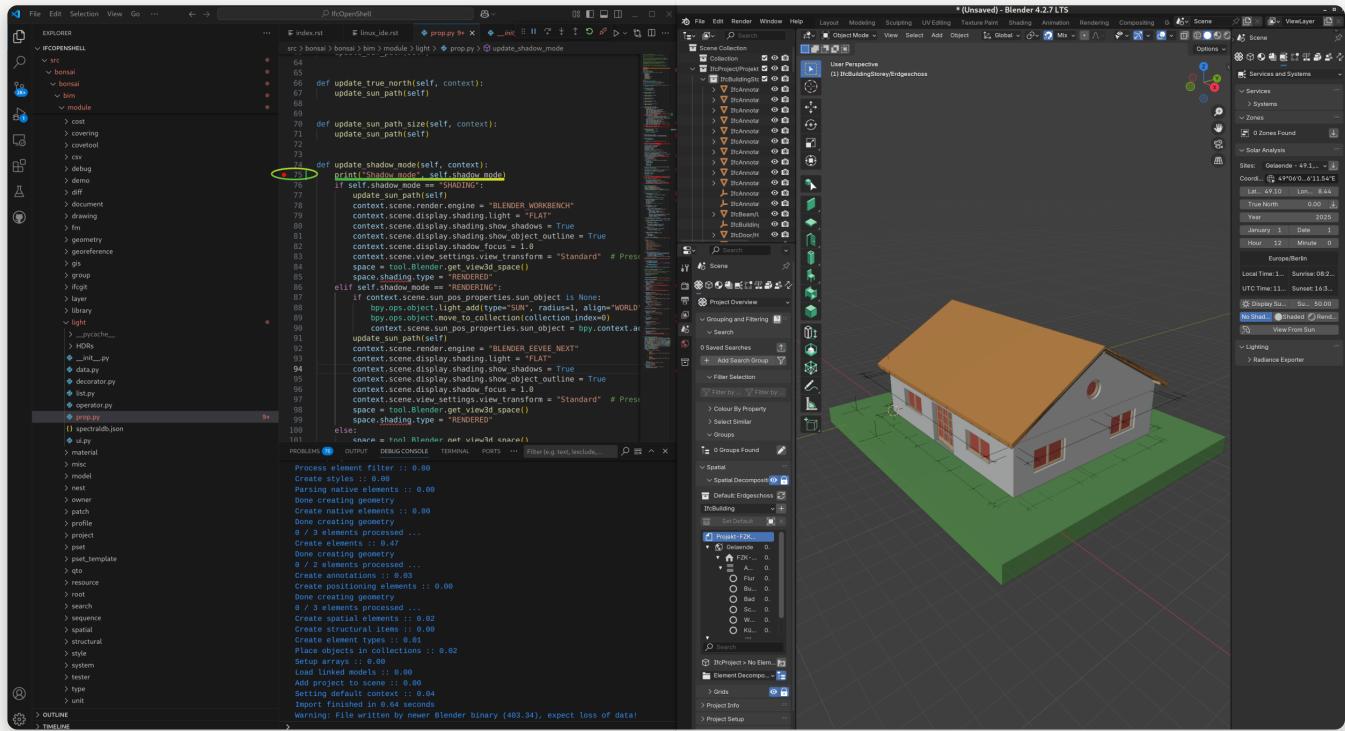


## 11. Adding a break-point:

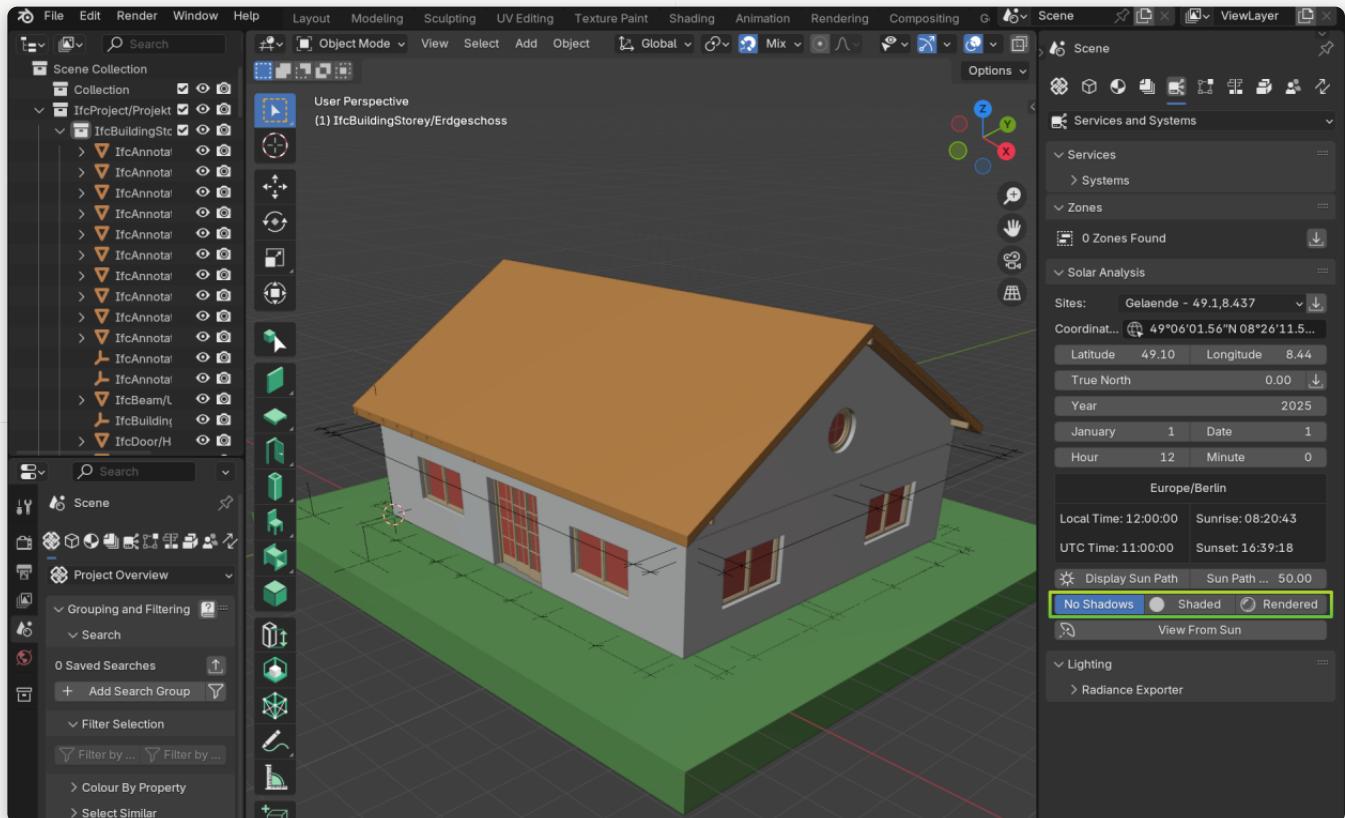
Let's add a break-point in the code to see how it works. Press **CTRL\_SHIFT\_P** and type "Blender: Start". Blender will start. Open the cloned folder and go to *src > bonsai > bonsai > bim > module > ligth > prop.py* and go to line 75. Add a line for a print statemente and click on the left side of the line number to add a break-point.

```
74     def update_shadow_mode(self, context):
75         print("Shadow mode", self.shadow_mode)
76         if self.shadow_mode == "SHADING":
```

Set a break-point in line 75.



In Blender. Go To SOLAR ANALYSYS Tool in Bonsai and Click in “No Shadow”, “Shaded” or “Rendered”



This will trigger the break-point. See how the execution is stopped at the break-point.

The screenshot shows the Bonsai IDE interface within VSCode. The main area is a code editor displaying Python code for Blender's sun path update logic. A yellow circle highlights line 75: `def update_shadow_mode(self, context):`. The code editor has a dark theme with syntax highlighting. Below the code editor is a 'PROBLEMS' panel showing various build logs. The bottom right corner shows a terminal window with the command `bash ide` and a file list including `blen...`.

```

34     def update_tattling(self, context):
56
57
58     def update_hourminute(self, context):
59         update_sun_path(self)
60
61
62     def update_date(self, context):
63         update_sun_path(self)
64
65
66     def update_true_north(self, context):
67         update_sun_path(self)
68
69
70     def update_sun_path_size(self, context):
71         update_sun_path(self)
72
73
74     def update_shadow_mode(self, context):
75         print("Shadow mode", self.shadow_mode)
76
77         if self.shadow_mode == "SHADING":
78             update_sun_path(self)
79             context.scene.render.engine = "BLENDER_WORKBENCH"
80             context.scene.display.shading.light = "FLAT"
81             context.scene.display.shading.show_shadows = True
82             context.scene.display.shading.show_object_outline = True
83             context.scene.view_settings.view_transform = "Standard" # Preset
84             space = tool.Blender.get_view3d_space()
85             space.shading.type = "RENDERED"
86
87         elif self.shadow_mode == "RENDERING":
88             if context.scene.sun_pos_properties.sun_object is None:
89                 bpy.ops.object.light_add(type="SUN", radius=1, align="WORLD")
90                 bpy.ops.object.move_to_collection(collection_index=0)
91                 context.scene.sun_pos_properties.sun_object = bpy.context.ac
92                 update_sun_path(self)
93
94             context.scene.render.engine = "BLENDER_EEVEE_NEXT"
95             context.scene.display.shading.light = "FLAT"
96             context.scene.display.shading.show_shadows = True
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```

is outdated compared to the IfcOpenShell main branch (<https://github.com/IfcOpenShell/IfcOpenShell>).

- b. Sync our fork with the upstream branch (if needed).
- c. Pull the changes in our project fork to our local repository (/home/falken10vdl/bonsaiDevel).
- d. Create a new branch in our local repository (example: *DOC\_QS\_IDE*)
- e. Publish the branch to our project fork in GitHub.
- f. Make changes in the code.
- g. Commit the changes.
- h. Push the changes to our project fork.
- i. Create a Pull Request to the upstream main branch of the IfcOpenShell project.

Let's see below the steps with an example of changing the documentation of the Quickstart guide for the IDE in Linux.

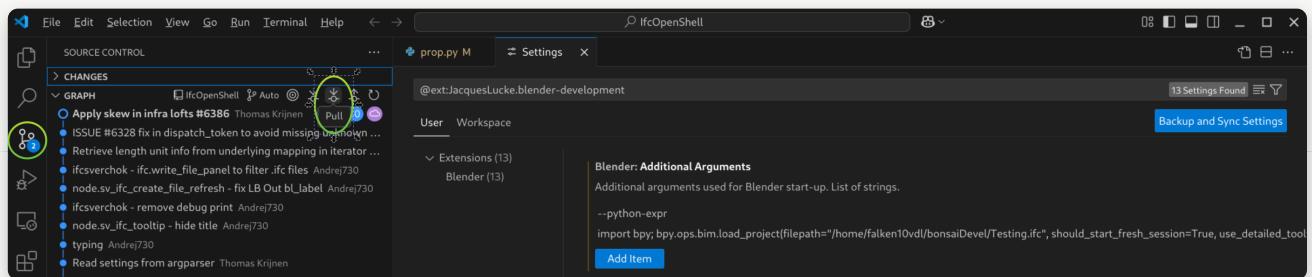
- a. Check in our GitHub page if our project fork is outdated. Click *Update branch*

The screenshot shows the GitHub fork page for the `IfcOpenShell` repository. The URL is <https://github.com/falken10vdl/IfcOpenShell>. The repository is public and was forked from `IfcOpenShell/IfcOpenShell`. The main branch is `v0.8.0`, which has 1 branch and 0 tags. A message at the top states: "This branch is 6 commits behind IfcOpenShell/IfcOpenShell:v0.8.0". To the right, there is an "About" section with details about the repository, including its purpose as an "Open source IFC library and geometry engine", and sections for "Readme", "Activity", "Releases", and "Packages". On the left, a list of commits is shown, and in the bottom right corner of this list, a green button labeled "Update branch" is highlighted.

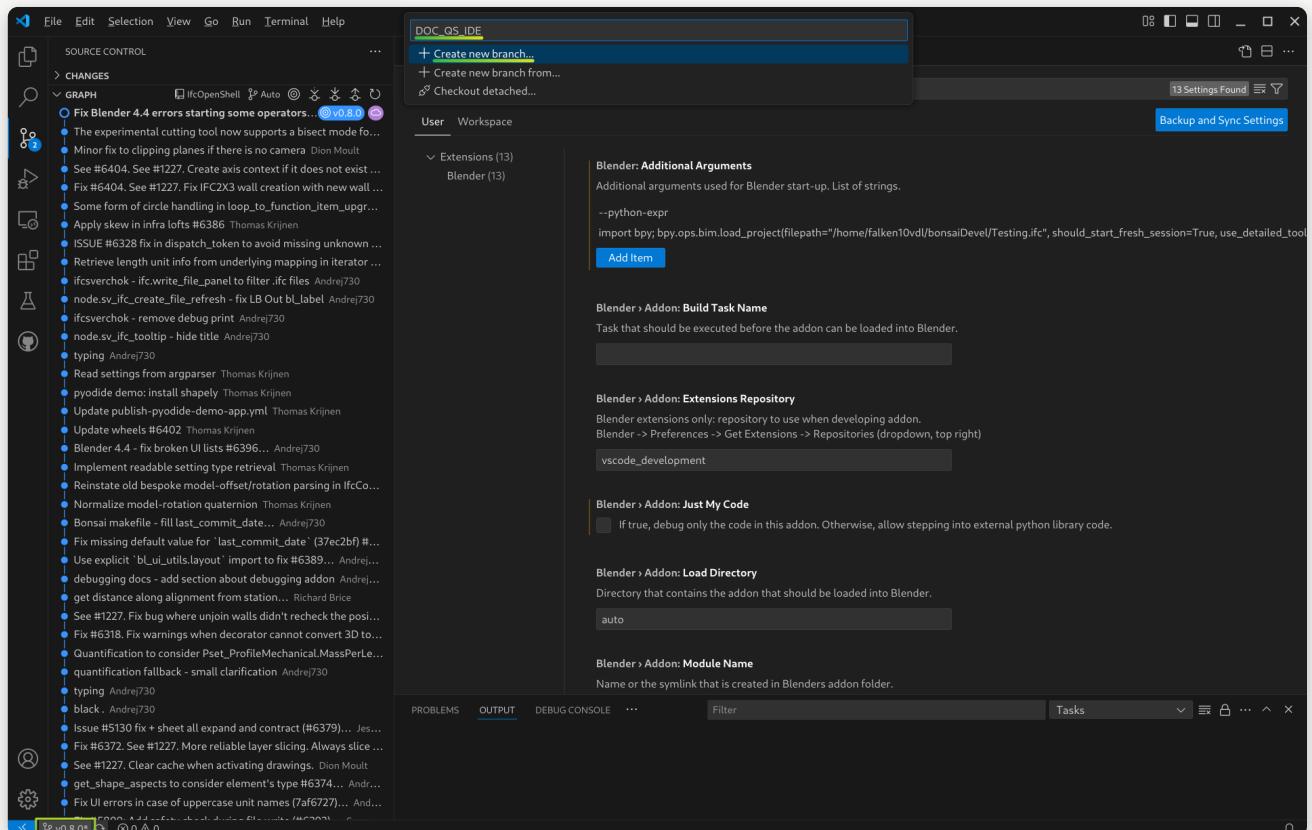
- b. After clicking *Update branch* our fork is up to date with the upstream main branch.

The screenshot shows the same GitHub fork page after the "Update branch" button was clicked. The status message "This branch is 6 commits behind IfcOpenShell/IfcOpenShell:v0.8.0" is no longer visible, indicating that the fork is now up-to-date with the upstream main branch.

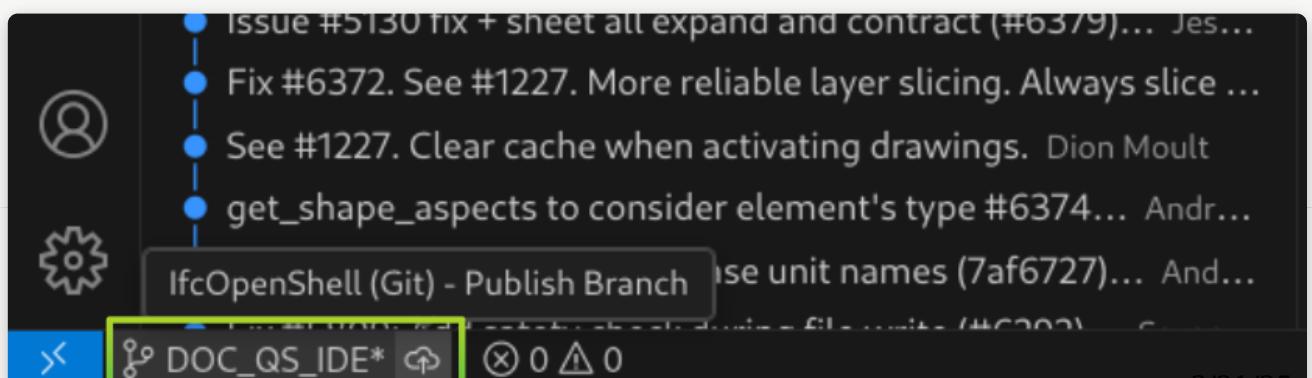
c. Pull the changes in our project fork to our local repository



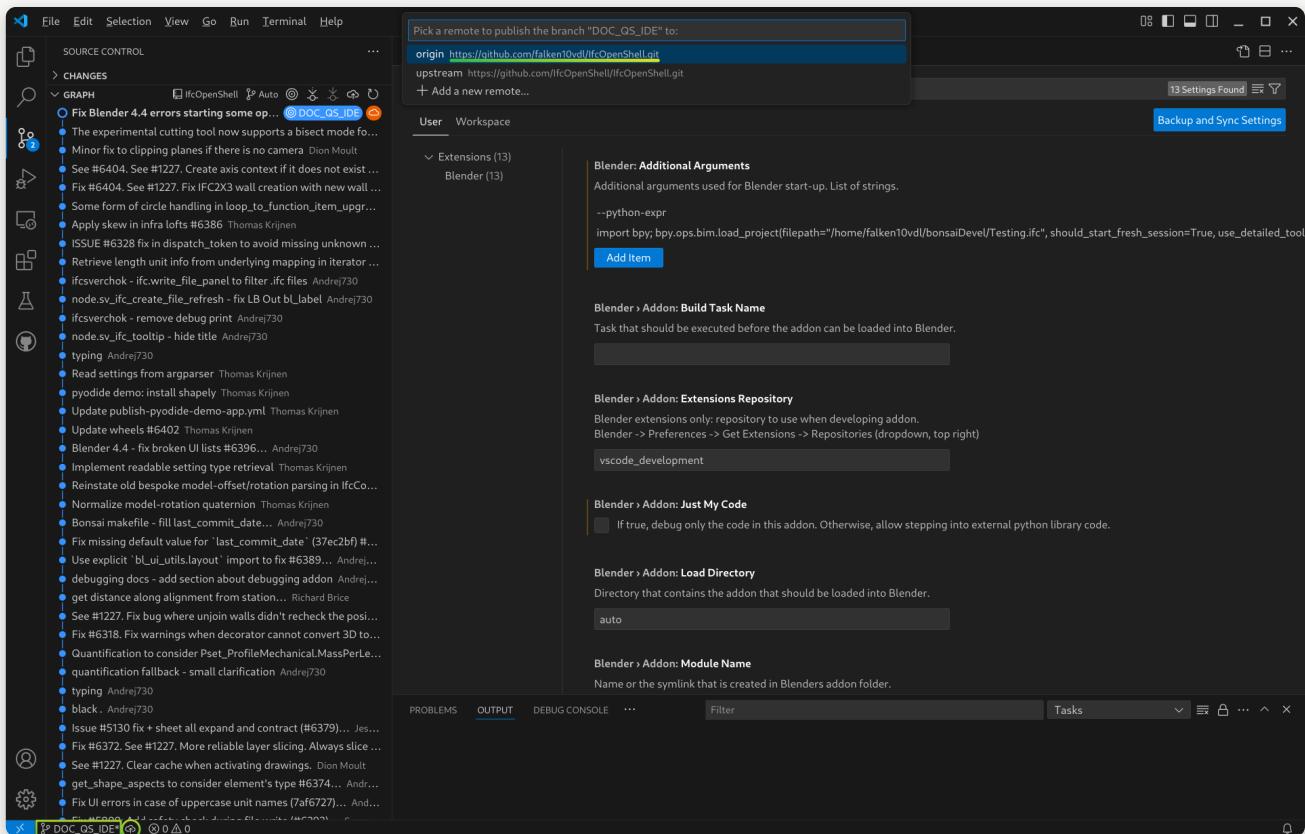
d. Create a new branch in our local repository by clicking in the current branch name in the bottom left corner of the VSCode window. Give a name to the branch and press Enter.



The new branch is created and we can see it in the bottom left corner of the VSCode window.



- e. Publish the branch to our project fork in GitHub by clicking in the publish button (*little cloud with up arrow*) in the bottom left corner of the VSCode window. Select as origin the project fork.



Check that the branch is now in our project fork in GitHub.

The screenshot shows a GitHub repository page for 'falken10vdl/IfcOpenShell'. The 'Code' tab is active. In the top-left of the code editor area, there is a dropdown menu labeled 'Switch branches/tags' with a search bar. A green circle highlights the 'DOC\_QS\_IDE' branch in this list. The main content area displays a list of recent commits:

- c0penShell:v0.8.0 · 1 hour ago · 17,506 Commits
- Update publish-pyodide-demo-app.yml · yesterday
- migrate docs urls · 11 months ago
- bonsaibim urls IfcOpenShell#5178 · 7 months ago
- Don't allow empty sha for add\_commit\_sha · 2 months ago
- bonsaibim urls IfcOpenShell#5178 · 7 months ago
- docs: include doxygen-awesome as git submodule · 11 months ago
- Update build-all.py; --force when fetch tags · last month
- wasm wheel fixes · 2 months ago
- Fix Blender 4.4 errors starting some operators IfcOpenShell#6386 · 1 hour ago

On the right side of the page, there are sections for 'About', 'Releases', and 'Packages'. The 'About' section describes 'IfcOpenShell' as an 'Open source IFC library and geometry engine'. The 'Releases' section indicates 'No releases published' and has a link to 'Create a new release'. The 'Packages' section indicates 'No packages published' and has a link to 'Publish your first package'.

The screenshot shows a list of pull requests in a GitHub-like interface:

- Fix Blender 2.8 errors starting some operators (IfcOpenShell) - 1 hour ago
- Unify variant storage (IfcOpenShell#5118) - 7 months ago
- Fetch boost from github releases in build scripts - 2 months ago
- .clang-format - clang-format: remove duplicates from base style - 2 years ago
- .clang-tidy - clang-tidy: add basic checks - 2 years ago

On the right, there is a "Languages" section with the following data:

Language	Percentage
C++	76.2%
Python	20.1%
C	2.6%
Gherkin	0.4%
JavaScript	0.2%
SWIG	0.1%
Other	0.4%

f. Make changes in the code. In this case we will change documentation by adding a Quickstart for the IDE in Linux. :)

The screenshot shows the VSCode editor with the file `linux_ide.rst` open. The code contains instructions for creating a pull request:

```

12. **Making changes and doing a Pull Request to the project**:
  In the previous steps we got a complete IDE to explore and make changes to the Bonsai sourcecode.
  a. Make changes in the code.
  b. Commit the changes.
  c. Push the changes to our project fork.
  d. Create a Pull Request to the upstream main branch of the IfcOpenShell project.

Let's see below the steps with an example of changing the documentation of the Quickstart guide for the IDE in Linux.

a. Check in our GitHub page if our project fork is outdated. Click *Update branch*
... image: images/check-fork.png
... width: 1000 px

b. After clicking *Update branch* our fork is up to date with the upstream main branch.
... image: images/sync-fork.png
... width: 1000 px

c. Pull the changes in our project fork to our local repository
... image: images/pull-changes.png
... width: 1000 px

d. Create a new branch in our local repository by clicking in the current branch name in the bottom left corner of the VSCode window. Give a name to the branch and press Enter.

```

g. Commit the changes. First provide your user name and email to Git.

The screenshot shows the VSCode terminal with the following commands entered:

```

$ git config --global user.email "falken10vdl@gmail.com"
$ git config --global user.name "falken10vdl"
$ 

```

Then commit the changes by clicking in the check mark in the Source Control tool.

The screenshot shows the Source Control tool in VSCode. A commit message "Add quickstart for Linux IDE" is selected in the staging area. A green circle highlights the checkmark icon in the toolbar, indicating the staged changes are ready to be committed. The commit message "Commit Changes on 'v0.8.0'" is shown at the bottom.

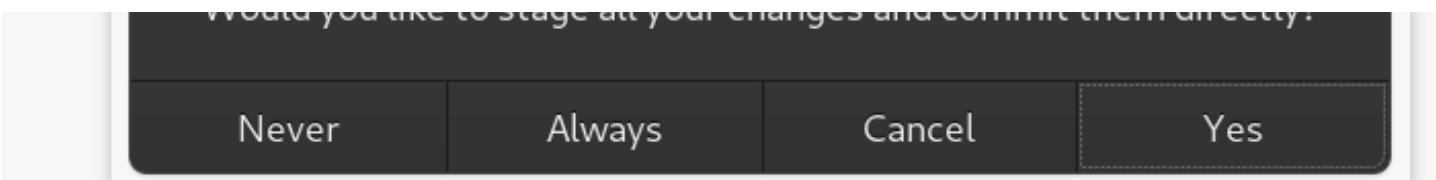
Accept the staging of the changes prior to commit.

The screenshot shows a "Visual Studio Code" window with the following text:

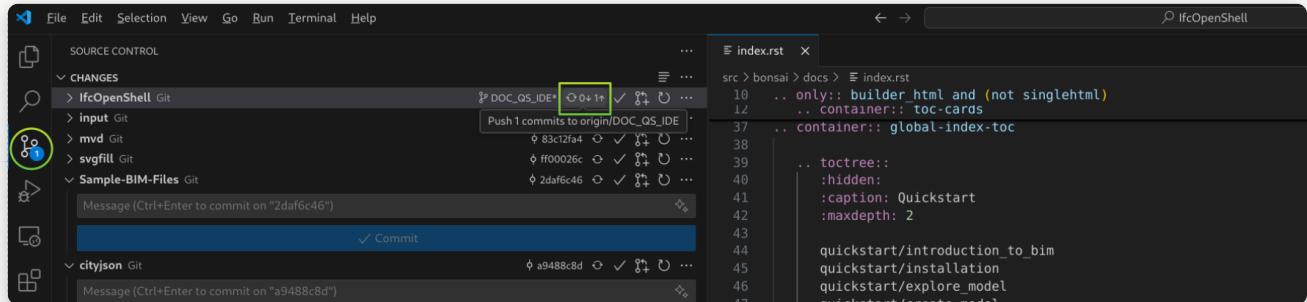
**Visual Studio Code**

There are no staged changes to commit.

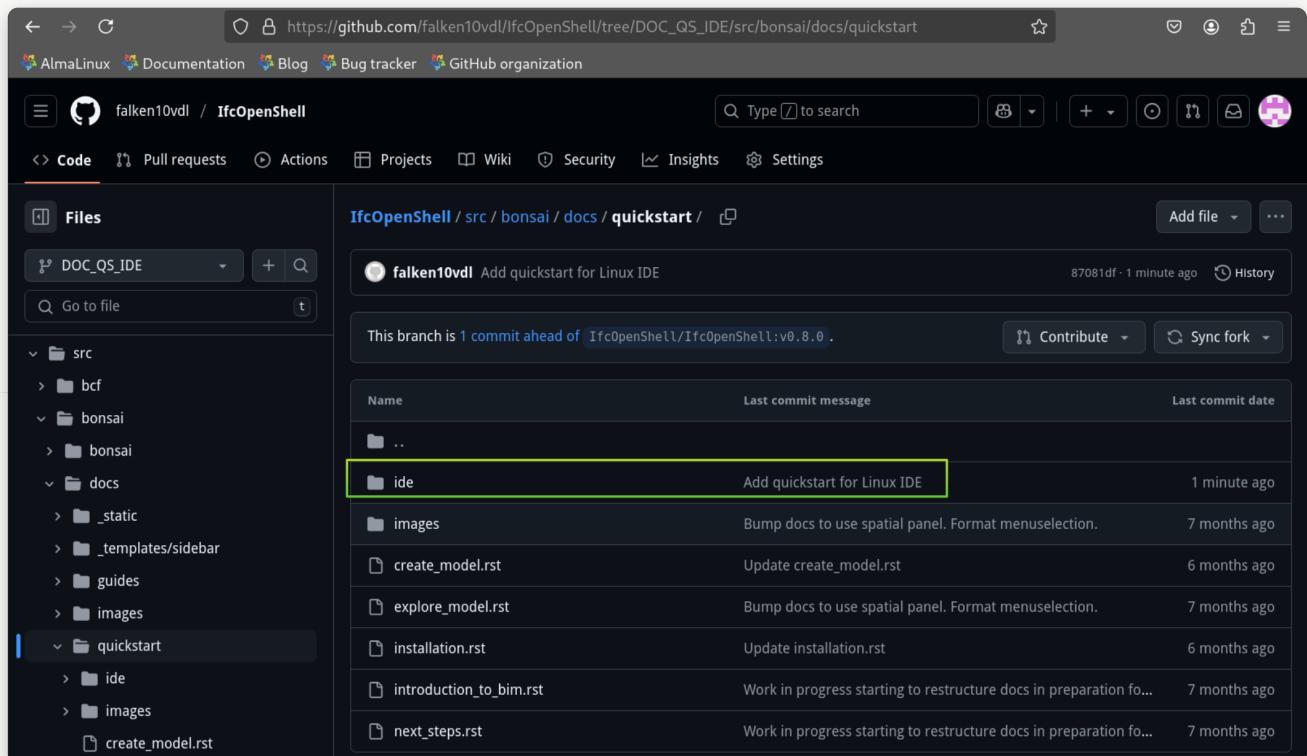
Would you like to stage all your changes and commit them directly?



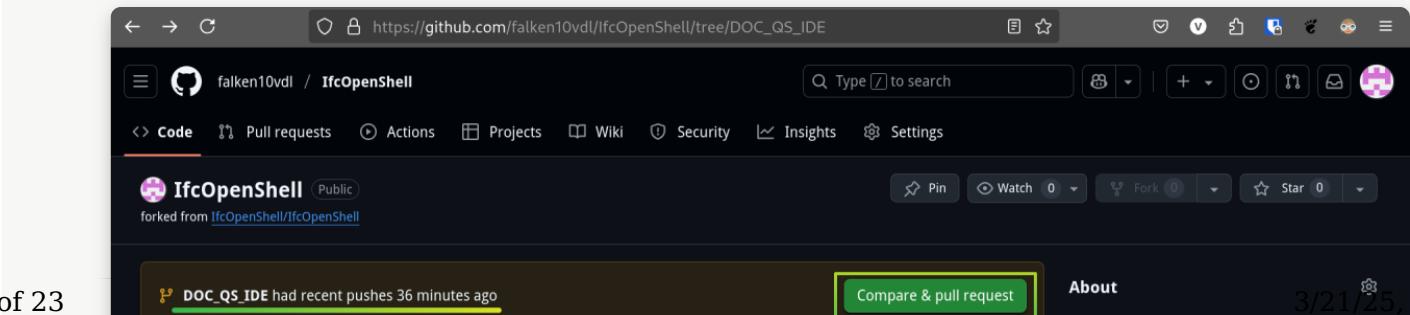
h. Push the changes to our new branch in the github project fork.

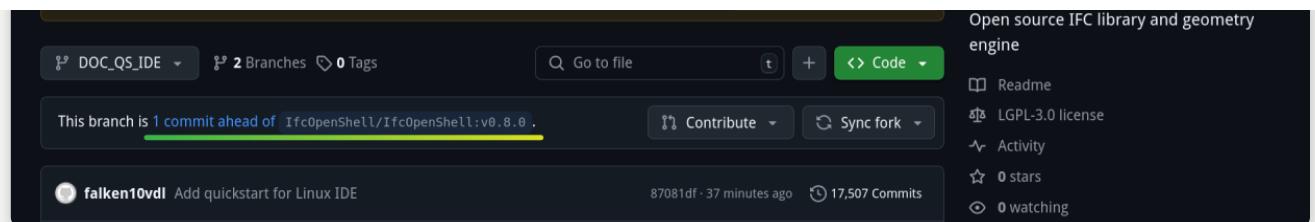


Check that the changes are in the project fork in GitHub. You can see that the directory *ide* has been added, for example.



i. Create a Pull Request to the upstream main branch of the IfcOpenShell project. Go to your GitHub page and you will see that the new branch has 1 commit ahead of the upstream main branch. Click in the *Compare & pull request* button.





Verify that the changes are correct, add a description and click in the *Create pull request* button.

A screenshot of the GitHub 'Comparing changes' page. It shows a comparison between 'base repository: IfcOpenShell/IfcOpenShell' (branch 'v0.8.0') and 'head repository: falken10vdl/IfcOpenShell' (branch 'compare: DOC\_QS\_IDE'). A green bar at the top says '✓ Able to merge. These branches can be automatically merged.' Below this, there's a section to 'Add a title' with the text 'Add quickstart for Linux IDE'. Under 'Add a description', there's a rich text editor with a preview tab and a WYSIWYG interface. The preview shows the text: 'This is documentation with all the steps required to implement a simple yet powerful IDE workflow to work with Bonsai Sourcecode in Linux'. At the bottom, there's a note that 'Markdown is supported' and a file upload area. A checkbox for 'Allow edits by maintainers' is checked. The 'Create pull request' button is highlighted with a green border.

CONGRATULATIONS! You have now made a change in the Bonsai project and created a Pull Request to the main branch of the project. Happy coding and documenting!



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