Setup PhysiCell on Apple

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2025-01-25

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Overview

This document describes the PhysiCell installation on Apple macOS.

- Homebrew GCC
- ImageMagick, FFmpeg

- PhysiCell

- Python3, iPython, pcdl
- PhysiCell Studio

- VSCode

Basic Setup

Extended Setup

IDE Setup

Brew (Basic Setup)

- Follow the instruction to download and install brew. Basically, copy the installation command, paste it into the Terminal (found at Applications / Utilities), and execute it.

  https://brew.sh/

- In the Terminal, after you have brew install, run the following commands:

  ```
  brew install gcc
  brew install imagemagick
  brew install ffmpeg
  ```

- If you installed brew in an uncommon place, make sure that `homebrew/bin` is under your `PATH`.

PhysiCell (Basic Setup)

Download PhysiCell and place it e.g in the ~/src folder.

```
mkdir -p ~/src
cd ~/src
git clone https://github.com/MathCancer/PhysiCell.git
```

Set the PHYSICELL_CPP environment variable.

```
g++ <TAB> <TAB> # something like g++-00 should pop up. check, that it is the same version in the export command bellow!
echo export PHYSICELL_CPP=$(compgen -c | grep -m 1 -e '^g++-[0-9]\+') >> ~/.zshenv
```

Test the installation with the template sample project.

```
cd PhysiCell
make template
make -j8
./project
make jpeg
make gif
make movie
```

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Python3 part I (Extended Setup)

We will **generate a python3 environment with the default python installation**, where we will install all PhysiCell modelling related python libraries. We will name this python3 environment **pcvenv** (PhysiCell virtual environment), and we install it in the src folder where just before have installed PhysiCell.

Here we demonstrate, how to generate the environment with the regular python. If you run mamba or conda, please adjust the commands accordingly.

- Generate a python environment named pcvenv:

  ```
  cd ~
  python3 -m venv src/pcvenv
  ```

- Generate an alias for this environment for activation:

  ```
  echo "alias pcvenv=\"source /Users/$USER/src/pcvenv/bin/activate\"" >> ~/.zshenv
  source ~/.zshenv
  ```

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Python3 part II (Extended Setup)

- Activate the pcvenv python environment using the alias generated before:

```
pcvenv
```

- Check if the python and pip paths point to the installed location:

```
which python3
which pip3
```

- Install the iPython shell:

```
pip3 install ipython
```

- Install the PhysiCell Data Loader:

🍎🍐`pip3 install pcdl`

PhysiCell Studio part I (Extended Setup)

- Download the studio, place it in the src folder, too, and install its python3 dependencies.

```
cd ~/src
git clone https://github.com/PhysiCell-Tools/PhysiCell-Studio.git
pip3 install -r PhysiCell-Studio/requirements.txt
```

- Put the studio under the environment's PATH:

```
cd ~/src/pcvenv/bin
echo "python3 /Users/$USER/src/PhysiCell-Studio/bin/studio.py \$*" > pcstudio
chmod 775 pcstudio
which pcstudio
cd ~
```

PhysiCell Studio part II (Extended Setup)

- Test the installation with the template sample project.

```
cd ~/src/PhysiCell
pcvenv
pcstudio
```

  PhysiCell Studio should open and load the template PhysiCell_settings.xml file.

- Please check out the official PhysiCell Studio manual:

  https://github.com/PhysiCell-Tools/Studio-Guide/tree/main

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MS Visual Studio Code part I (IDE Setup)

1. Install vs code, either from your operating system's app store or from https://code.visualstudio.com/

2. Generate a vs code profile for physicell:

    ```
    File | New Window with Profile
    Name: physicell
    Icon: choose a cool one. e.g. 🔥.
    Create
    Add Folder: Home/src
    click the profile icon (default is a gearwheel) on the left side bottom corner.
    Profile > physicell
    ```

3. Open the Folder:

    ```
    File | Open Folder… | src | Open
    Yes, I trust the authors
    ```

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MS Visual Studio Code part II (IDE Setup)

1. Install the official python and C++ extensions into the profile:

    ```
    click the profile icon (default is a gearwheel) on the left side bottom corner.

    Profile > physicell

    Extension: Python Install

    Extension: C/C++ Install
    ```

2. Link pcvenv (the python environment we generated above):

    ```
    View | Command Palette… | Python: Select Interpreter |
    Enter interpreter path… | Find… | src/pcvenv
    ```

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Acknowledgement

The first version of this installation manual was written for the summer workshop in 2022 by:

★ Aneequa Sundus (Windows)
★ Furkan Kurtoglu (Windows)
★ John Metzcar (Apple)
★ Randy Heiland (Apple)