Setup PhysiCell on Apple

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Overview

This document describes the PhysiCell installation on Apple macOS.

- Homebrew GCC
- ImageMagick, FFmpeg
- PhysiCell

Minimum Setup

- Python3, iPython, pcdl
- PhysiCell Studio

Extended Setup

- VSCode

IDE Setup

Brew (Minimum 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`.

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PhysiCell (Minimum 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. use the exact version in the export command bellow!
echo export PHYSICELL_CPP=g++-00 >> ~/.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 **physienv**, 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 physienv:

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

- Generate an alias for this environment for activation:

```
echo 'alias physienv="source /Users/<username>/src/physienv/bin/activate"' >> ~/.zshenv
source ~/.zshenv
```

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Python3 part II (Extended Setup)

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

```
physienv
```

- 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/physienv/bin
echo 'python3 /Users/<username>/src/PhysiCell-Studio/bin/studio.py $*' > pcstudio
chmod 775 pcstudio
which pcstudio
cd ~
```

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PhysiCell Studio part II (Extended Setup)

- Test the installation with the template sample project.

```
cd ~/src/PhysiCell
physienv
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 physienv (the python environment we generated above):

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

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