

Setup PhysiCell on Windows

Elmar Bucher, Ph.D.-Student

Intelligent Systems Engineering
Indiana University

2025-01-25



LUDDY

SCHOOL OF INFORMATICS, COMPUTING, AND ENGINEERING



@MathCancer.bsky.social

Macklin Lab
MathCancer.org

Overview

This document describes the PhysiCell installation on a Microsoft Windows machine.

- msys2 gcc make
- imagemagick ffmpeg unzip zip
- git
- PhysiCell

} Minimum
Setup

-
- Python3, iPython, pcdl
 - PhysiCell Studio

} Power User
Setup

-
- VSCode

} IDE
Setup



LUDDY

SCHOOL OF INFORMATICS, COMPUTING, AND ENGINEERING



@MathCancer.bsky.social

Macklin Lab
MathCancer.org

Msys2 part I (Minimum Setup)

- Download and install msys2 x86_64.

<https://www.msys2.org/>

- Open the MSYS2 MINGW64 terminal.

```
pacman -S mingw-w64-x86_64-gcc make
```


```
pacman -S mingw-w64-x86_64-imagemagick mingw-w64-x86_64-ffmpeg
```

```
pacman -S unzip zip
```

```
pacman -S mingw-w64-x86_64-ca-certificates
```

```
pacman -S git
```

- Additionally, we will generate a src folder in your Windows Home directory, where we later on will install PhysiCell and PhysiCell-Studio into it.

```
 mkdir -p /c/Users/<username>/src
```

PhysiCell (Minimum Setup)

- Open the msys2 MINGW64 terminal, cd into the src directory and download PhysiCell.

```
cd /c/Users/<username>/src
```

```
git clone https://github.com/MathCancer/PhysiCell.git
```

- Test the installation with the template sample project.

```
cd PhysiCell
```

```
make data-cleanup clean reset
```

```
make template
```

```
make -j8
```

```
./project
```

```
make jpeg
```

```
make gif
```

```
make movie
```



LUDDY

SCHOOL OF INFORMATICS, COMPUTING, AND ENGINEERING



@MathCancer.bsky.social

Macklin Lab
MathCancer.org

Overview

This document describes the PhysiCell installation on a Microsoft Windows machine.

- msys2 gcc make
- imagemagick ffmpeg unzip zip
- git
- PhysiCell



Minimum
Setup

-
- Python3, iPython, pcdl
 - PhysiCell Studio

-
- VSCode



Power User
Setup



IDE
Setup



LUDDY

SCHOOL OF INFORMATICS, COMPUTING, AND ENGINEERING



@MathCancer.bsky.social

Macklin Lab
MathCancer.org

Python3 part I (Power User Setup)

We will **generate a python3 environment with the default Windows 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.

- Open the **Windows PowerShell terminal!**

The first command will let you know if you have python installed. If not, then please go to the Microsoft Store and install the latest release available from the Python Software Foundation.

```
Get-Command python.exe
```

```
cd ~
```

```
python.exe -m venv src/physienv
```



Python3 part II (Power User Setup)

Now, we link the python executable in this physienv as the default python installation for the msys2 terminal.

- Open the **msys2 MINGW64 terminal** to generate an alias for this environment for activation:

```
echo 'alias physienv="source /c/Users/<username>/src/physienv/Scripts/activate"' >>  
~/.bash_profile
```

```
source ~/.bash_profile
```

```
physienv # activate the environment
```

which python # this should point to the python in the physienv/Scripts folder. if not, you made a mistake! please correct.

which pip # this should point to the python in the physienv/Scripts folder. if not, you made a mistake! please correct.

```
cd /c/Users/<username>/src/physienv/Scripts
```

```
ln -s python.exe python3.exe
```

which python3 # this should point to the python.exe file in the physienv/Scripts folder. if not, you made a mistake! please correct.



which pip3 # this should point to the python.exe file in the physienv/Scripts folder.

Python3 part III (Power User Setup)

- Open the msys2 MINGW64 terminal and activate the physienv python environment using the alias generated before:

```
physienv
```

- Install the iPython shell:

```
pip3 install ipython
```

- Install the PhysiCell Data Loader:

```
pip3 install pcdl
```



PhysiCell Studio part I (Power User Setup)

- Open the msys2 MINGW64 terminal, cd into the src directory, download PhysiCell Studio and install its python3 dependencies.

```
cd /c/Users/<username>/src
```

```
git clone https://github.com/PhysiCell-Tools/PhysiCell-Studio.git
```

```
pip3 install -r PhysiCell-Studio/requirements.txt
```

- Put the studio under the PATH:

```
cd /c/Users/<username>/src/physienv/Scripts
```

```
echo 'python3 /c/Users/<username>/src/PhysiCell-Studio/bin/studio.py %*' >  
studio.exe
```

```
which studio # this should point to the studio.exe file in the Scripts folder.
```



PhysiCell Studio part II (Power User Setup)

- Test the installation with the template sample project:

```
cd /c/Users/<username>/src/PhysiCell  
physienv  
studio
```

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>



Overview

This document describes the PhysiCell installation on a Microsoft Windows machine.

- msys2 gcc make
- imagemagick ffmpeg unzip zip
- git
- PhysiCell

Minimum
Setup

-
- Python3, iPython, pcdl
 - PhysiCell Studio

Power User
Setup

IDE
Setup

-
- VSCode



LUDDY

SCHOOL OF INFORMATICS, COMPUTING, AND ENGINEERING



@MathCancer.bsky.social

Macklin Lab
MathCancer.org

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



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



MS Visual Studio Code part III (IDE Setup)

1. Link msys2 MINGW64 as default terminal:

View | Command Palette... | Preferences: Open Workspace Settings (JSON)

copy the **msys2 configuration json for visual studio code** (not sublime text!) found at <https://www.msys2.org/docs/ides-editors/#visual-studio-code> and pasted it into the vs code settings.json .

close the settings.json tab # a dialog window will pop up.

click Save

Terminal | New Terminal # a msys2 terminal integrated into the vs code IDE should open.



Overview

This document describes the PhysiCell installation on a Microsoft Windows machine.

- msys2 gcc make
- imagemagick ffmpeg unzip zip
- git
- PhysiCell



Minimum
Setup

-
- Python3, iPython, pcdl
 - PhysiCell Studio

-
- VSCode



Power User
Setup



IDE
Setup



LUDDY

SCHOOL OF INFORMATICS, COMPUTING, AND ENGINEERING



@MathCancer.bsky.social

Macklin Lab
MathCancer.org