

OhioT1DMViewer User Documentation

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Introduction

The OhioT1DM Viewer is medical data visualization software that is used to visualize data for people with type 1 diabetes. This tool displays data from insulin pumps, continuous glucose monitoring sensors, physiological sensor bands, and patient-entered life events (e.g., meals, sleep, and exercise). The goal of this software system is to help researchers visualize all of the data in a comprehensive, integrated way. This may aid in providing intuition into the data as well as in debugging systems built using the data. For example, if a blood glucose level prediction system makes a poor prediction at a particular point in time, viewing the data at that time may provide insight into the system's poor performance.

A video tutorial which explains the features and usage of the OhioT1DM Viewer can be found at: <https://youtu.be/Kn8uMb97RgA>

The types of data displayed by the OhioT1DM Viewer include:

Insulin Data:

- Basal Rate
- Temporary Basal
- CGM
- Fingersticks
- Bolus Events

Physiological Sensor Data:

- Acceleration
- Skin Temperature
- Air Temperature
- Heart Rate
- GSR
- Steps
- Detected Sleep

Patient-Entered Data:

- Hypo Events
- Meals
- Work
- Stressors
- Reported Sleep
- Illnesses

The remainder of this document explains how to install and run the OhioT1DM Viewer. The software is available for Windows, Linux, and Mac platforms. The OhioT1DM Viewer may be run as a Windows executable, may be installed using Conda on all platforms, or may be installed from source code.

How to Run the Executable on Windows

The executable files for Windows 8 and 10 are contained in the `Windows_executable` directory. Inside that directory is the `dist` directory and a file named `run.bat`. To run the Windows executable, double-click on the `run.bat` file, which will start the OhioT1DM Viewer.

How to Install and Run using Conda

Conda is a cross-platform package manager for Python3, with two separate distributions: Anaconda 3 and Miniconda 3. Anaconda automatically installs over 150 scientific Python packages with conda, whereas

Miniconda is lightweight and allows packages to be installed more individually, as well as an option to upgrade to Anaconda. However, both distributions can be used to install the necessary modules on Windows, Mac, and Linux.

Anaconda 3 Instructions:

Official website to download: <https://www.anaconda.com/download/>. Download the installer for your operating system using the link above. Follow the prompts to install Anaconda 3 on your system. Anaconda is very large, so the installation process may take some time

- **Windows Anaconda 3 Installation Details:**

- The program to access conda on Windows is the Anaconda Prompt. To ensure the installation was successful, type the command “conda list” into the Anaconda Prompt, which will print the list of installed packages. If an error is shown, Anaconda has installation guides that may be able to help.
- Type the command “conda install -c robinkelby ohiot1dmviewer” into the Anaconda Prompt, which will install the OhioT1DMViewer package onto your computer, as well as all necessary dependencies. More details can be found at: <https://anaconda.org/robinkelby/ohiot1dmviewer>
- To start the software, type the command “python Anaconda3\Lib\site-packages\OhioT1DMViewer.py”, which will start the OhioT1DMViewer.

- **Mac Anaconda 3 Installation Details:**

- For the terminal to be used with conda, the system PATH variable must be updated.
 - For bash users: “export PATH=~/anaconda3/bin:\$PATH”
 - For csh/tcsh users: “setenv PATH ~/anaconda3/bin:\$PATH”
- Open the terminal and type the command “conda install -c robinkelby ohiot1dmviewer”, which will install the OhioT1DMViewer package onto your computer, as well as all necessary dependencies. More details can be found at: <https://anaconda.org/robinkelby/ohiot1dmviewer>
- To start the software, type the command “pythonw ~/anaconda3/lib/python3.6/site-packages/OhioT1DMViewer.py”, which will start the OhioT1DMViewer. Pythonw is a version of python that enables non-framework python installations to create graphical interfaces on Mac.

- **Linux Anaconda 3 Installation Details:**

- For the terminal to be used with conda, the system PATH variable must be updated.
 - For bash users: “export PATH=~/anaconda3/bin:\$PATH”
 - For csh/tcsh users: “setenv PATH ~/anaconda3/bin:\$PATH”
- You may also need to restart your terminal after the above command
- Open the terminal and type the command “conda install -c robinkelby ohiot1dmviewer”, which will install the OhioT1DMViewer package onto your computer, as well as all necessary dependencies. More details can be found at: <https://anaconda.org/robinkelby/ohiot1dmviewer>
- To start the software, type the command “python ~/anaconda3/lib/python3.6/site-packages/OhioT1DMViewer.py”, which will start the OhioT1DMViewer.

Miniconda 3 Instructions:

- Official website to download: <https://conda.io/miniconda.html>
- Download the installer for your operating system using the link above
- Follow the prompts to install Miniconda 3 on your system
- **Windows Miniconda 3 Installation Details:**

- The program to access conda on Windows is the Anaconda Prompt. To ensure the installation was successful, type the command “conda list” into the Anaconda Prompt, which will print the list of installed packages. If an error is shown, Anaconda has installation guides that may be able to help.
- Type the command “conda install -c robinkelby ohiot1dmviewer” into the Anaconda Prompt, which will install the OhioT1DMViewer package onto your computer, as well as all necessary dependencies. This may take some time, as many packages will need to be installed. More details can be found at: <https://anaconda.org/robinkelby/ohiot1dmviewer>
- To start the software, type the command “python Miniconda3\Lib\site-packages\OhioT1DMViewer.py”, which will start the OhioT1DMViewer.
- **Mac Installation Details:**
 - For the terminal to be used with conda, the system PATH variable must be updated.
 - For bash users: “export PATH=~/miniconda3/bin:\$PATH”
 - For csh/tcsh users: “setenv PATH ~/miniconda3/bin:\$PATH”
 - Open the terminal and type the command “conda install -c robinkelby ohiot1dmviewer”, which will install the OhioT1DMViewer package onto your computer, as well as all necessary dependencies. This may take some time, as many packages will need to be installed. More details can be found at: <https://anaconda.org/robinkelby/ohiot1dmviewer>
 - To start the software, type the command “pythonw ~/miniconda3/lib/python3.6/site-packages/OhioT1DMViewer.py”, which will start the OhioT1DMViewer. Pythonw is a version of Python that enables non-framework python installations to create graphical interfaces on Mac.
- **Linux Installation Details:**
 - For the terminal to be used with conda, the system PATH variable must be updated.
 - For bash users: “export PATH=~/miniconda3/bin:\$PATH”
 - For csh/tcsh users: “setenv PATH ~/miniconda3/bin:\$PATH”
 - You may also need to restart your terminal after the above command
 - Open the terminal and type the command “conda install -c robinkelby ohiot1dmviewer”, which will install the OhioT1DMViewer package onto your computer, as well as all necessary dependencies. This may take some time, as many packages will need to be installed. More details can be found at: <https://anaconda.org/robinkelby/ohiot1dmviewer>
 - To start the software, type the command “python ~/miniconda3/lib/python3.6/site-packages/OhioT1DMViewer.py”, which will start the OhioT1DMViewer.

How to Install from the Source Code:

This software requires Python3 and is compatible with Windows, Mac, and Linux. To run this software from source code, the following packages are required:

- **Required Dependencies:**
 - **Python 3.x.x:**
 - For development, Python 3.6.5 was used
 - Official website to download: <https://www.python.org/downloads/>
 - Windows instructions: The link above contains executables for installing Python3
 - Linux instructions: Python is already installed for many distros, but if it is not or Python 2 is the only version installed, the Python3 packages are python3 and python3-dev
 - **Python Pip:**
 - For development, Pip 10.0.1 was used
 - Official website to install: <https://pip.pypa.io/en/stable/installing/>
 - Pip is one of the package managers for Python for Windows, Linux, and Mac, and comes

- installed for Python 3 >= version 3.4. If pip is not already installed, follow the instructions in the link above. Pip is necessary to install the remaining Python packages.
- **Matplotlib:**
 - For development, Matplotlib 2.2.2 was used
 - Official website to install: https://matplotlib.org/faq/installing_faq.html
 - Matplotlib is used to graph the data to the screen, and can be installed using pip
 - **Numpy:**
 - For development, Numpy 1.11.0 was used
 - Official website to install: <https://www.scipy.org/install.html>
 - Numpy is used for the calculations necessary for this software, and can be installed using pip
 - **WxPython**
 - For development, WxPython 4.0.1 was used
 - Official website to install: <https://github.com/wxWidgets/Phoenix#id2>
 - WxPython Phoenix is an upgrade to “classic” wxPython that was used in the development of the PhysioGraph tool. “Classic” wxPython is no longer in development, and this project has also been upgraded to use wxPython Phoenix. WxPython can be installed using pip, but it can take some time to install. Linux users should be aware that additional software dependencies may be required to install wxPython, and those dependencies are listed in the link above.
- If a dependency is not found when attempting to install these packages, you can try searching for it in the Python Package Index (<https://pypi.python.org/pypi>).
 - **Source Code:** To get the source code for the OhioT1DMViewer, go to this link: <https://anaconda.org/robinkelby/ohiot1dmviewer>. Click on the light green “Files” button to the right of the green “Conda” button, and download the top file, which is the latest release. Unpack the tar.bz2 archive using 7Zip or some other archive program. Once that tar archive is completely unpacked, the site-packages directory contains the OhioT1DMViewer source code modules.
 - **Start Instructions:** To start the software, you will need to locate the OhioT1DMViewer.py file, the location of which will depend on your operating system. Once that file is located, run the command “python OhioT1DMViewer.py” from either the Command Prompt on Windows or the terminal for Mac and Linux, which will start the software.