Appendix A EvaSIM - Installing and Configuring

A.1 Installing Python and Dependencies

Both the EvaML language parser and the EvaSIM simulator were developed using the Python language. The parser uses the standard Python library along with *xmlschema* module, while the simulator uses some extra libraries that must be installed. For the EvaSIM, the entire graphical user interface was built using the *tkinter* package which is a thin object-oriented layer on top of *Tcl/Tk*. The Text-To-Speech process uses the *IBM-Watson* library.

A.1.1 Installation on Windows 10

First, go to https://www.python.org/downloads/ and download the latest version of Python, in this case, we used version 3.10.1(64-bit). Start the installation process and select the options indicated in the images as you can see in Figure A.1. During the installation, make sure to choose the option "customize installation" and also choose the option "Add python 3.10 to PATH".

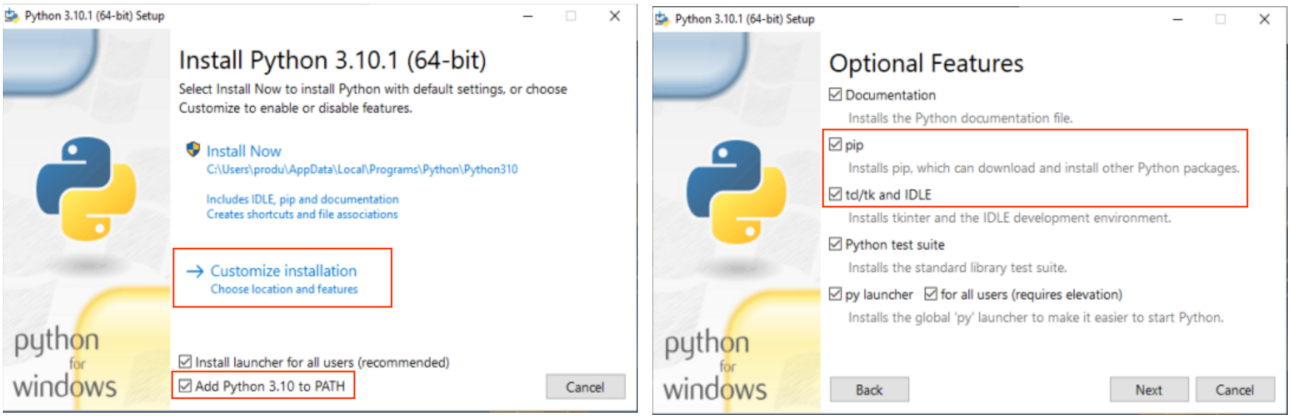

Figure A.1: Windows 10 - Python installation

Choosing the customization option allows you to select the automatic installation of *pip* (the standard package manager for Python) and also the *tk* library. Figure A.1 shows the options that should be selected.

Then we continue with the installation of dependencies. First let us install the *xmlschema* module. It is the component responsible for the EvaML script validation process. This validation is done based on the XML Schema file defined for EvaML. An EvaML script must meet the rules defined in the XML Schema file. XML Schema describes the structure of EvaML, and it is a basic consistency control mechanism. The process of validating the EvaML document against the XML Schema file is performed in the first step of the parser.

```
pip install xmlschema
```

Now let us install the *IBM-Watson* library. For that, we will use Python's package manager, which makes everything really easy. The following command must be executed in the Windows terminal.

```
pip install ibm-watson
```

Next we will install the *playsound* library. The version installed must be the version specified in the *pip* command, as the latest version had issues on Windows 10.

```
pip install sounddevice
pip install soundfile
pip install numpy
```

If all steps worked correctly, we already have everything needed for the EvaML *parsing* process and for running the EvaSIM simulator.

A.1.2 Installation on Fedora 35 (RPM)

By default, the Fedora 35 distribution already comes with Python 3 installed, so we will proceed with installing the extra libraries. First, let us install *pip* (Python's package manager).

```
sudo dnf install python3-pip
```

We continue with the installation of the *tkinter* graphic library.

```
sudo dnf install python3-tkinter
```

Following are the commands for installing the *xmlschema*, *IBM-Watson* and *playsound* libraries.

```
pip install xmlschema
pip install ibm-watson
pip install playsound
```

We already have everything we need to run the *parser* and the simulator.

A.1.3 Installation on Ubuntu 20.04.3 (Deb)

As with Fedora, Python 3 is already installed by default on Ubuntu 20.04.3. We then proceed with the installation of the package manager for Python (*pip*).

```
sudo apt install python3-pip
```

Now we install the *tkinter* graphics library.

```
sudo apt install python3-tk
```

Following are the commands for installing the *xmlschema*, *IBM-Watson* and *playsound* libraries.

```
pip install xmlschema
pip install ibm-watson
pip install playsound
```