CT303 - Digital Communications

Semester: Autumn 2020 Credit Structure: 3-0-2-4

A Prelude to the Lab

Due to the pandemic situation, students will need to implement the labs for this course at home. To reduce the internet data instead of using MATALB, we will conduct the labs using Python, an open source software. This document gives details of the preparation necessary for the lab.

1. Python3: The labs will be based on Python3 (not Python2). It can be downloaded from here. Python version 3.8.5 is recommended, and is available for Windows/Mac OS/Linux. A guide on the installation process is available here. Once installed, check your Python3 version using `python3 --version` in Ubuntu, or by double clicking `python.exe` in Windows (in the installation folder).

2. Pip (Python package manager): It is recommended to install `pip3`, the Python package manager for Python3. This will be useful for installing other required libraries/packages. For Ubuntu, `sudo apt install python3-pip` should be enough. For latest version of Python3 in Windows, pip is built into it. Check by typing `pip -v` in command prompt. If not installed, follow the guide here.

3. Numpy (Numerical Python): We will be using a lot of tools from linear algebra in the labs. Most of the required functions are available in the NumPy (Numerical Python) library. With `pip` installed, just type in `pip3 install numpy` on the command prompt in Ubuntu/Windows. Verify using `pip3 show numpy`, and upgrade the Numpy version using `pip3 install -upgrade numpy`.

4. SciPy: Communication engineering cannot do without Fourier transform, convolution and other tools. The SciPy library contains such functions (and more). To install SciPy, type `pip3 install scipy`.

5. MatPlotlib: Functions in order to plot signals and other data are available in the library MatPlotlib. Install using `sudo apt-get install python3-matplotlib` or `python3 -m pip install`.

6. Jupyter Notebook: This is a recommended front-end for writing and debugging codes. It is available here.

Students must ensure that they have a system which has all the above sofware/packages installed well before the first lab. Contact the TAs for issues in installation.