CSIP5403

Research Methods and Applications  
Lab Sheet – 1

# Aims

* To discuss Python-based tools for AI. Look at ‘**CSIP5403\_Python for AI**’ slides.
* To explore tools such as Numpy, Matplotlib, Seaborn, Pandas, Scitkit-learn, PyTorch, etc.
* To try some examples of these tools using any Python IDE or on Google Colab.
* Useful links:
  + <https://cs231n.github.io/python-numpy-tutorial/>
  + <https://www.w3schools.com/python/>

# Part 1 – Python for AI

1. Read the ‘**CSIP5403\_Python for AI**’ slides and discuss about each tool.
2. What are Numpy, Matplotlib, Seaborn, Pandas, Scitkit-learn, PyTorch, etc. used for? Compare and contrast them.
3. What are OpenCV and Open3D?

# Part 2 – Getting started with Google Colab

1. Create a google account and log into it (if you don’t have google account such as gmail).
2. Open the colab web site:
3. <https://colab.research.google.com/notebooks/welcome.ipynb#scrollTo=gJr_9dXGpJ05>
4. Follow the tutorials, watch the videos, execute the code bits and read all the links in this page and familiarize yourself with colab
5. You also need to look at the ‘**CSIP5403\_Python for AI**’ slides to learn more other important tools and then try some examples on Google Colab. For instance, write and execute Python program.
6. After uploading ‘data’ folder to the Google Colab, you can use the following script to access its contents to work on:

from google.colab import drive

drive.mount("/content/drive/")

!ls "/content/drive/My Drive/Colab Notebooks/"

For instance, you can access the contents of ‘data/data1’ folder using: '/content/drive/My Drive/Colab Notebooks/data/data1’

# Part 3: Starting on Mini-Project

Identify one or two group members to work with (this could be your lab group if you have already been working on lab exercises within a group).

Identify the topic of your **mini-project**.