

## ▼ Data Load & preprocessing

### ▼ Connect to google drive

```
!pip install PyDrive
```

```
Requirement already satisfied: PyDrive in /usr/local/lib/python3.6/dist-packages (1.3.1)
Requirement already satisfied: oauth2client>=4.0.0 in /usr/local/lib/python3.6/dist-packages (4.1.3)
Requirement already satisfied: PyYAML>=3.0 in /usr/local/lib/python3.6/dist-packages (3.12)
Requirement already satisfied: google-api-python-client>=1.2 in /usr/local/lib/python3.6/dist-packages (1.7.1)
Requirement already satisfied: httplib2>=0.9.1 in /usr/local/lib/python3.6/dist-packages (0.11.0)
Requirement already satisfied: six>=1.6.1 in /usr/local/lib/python3.6/dist-packages (1.11.0)
Requirement already satisfied: pyasn1-modules>=0.0.5 in /usr/local/lib/python3.6/dist-packages (0.2.8)
Requirement already satisfied: rsa>=3.1.4 in /usr/local/lib/python3.6/dist-packages (3.4.2)
Requirement already satisfied: pyasn1>=0.1.7 in /usr/local/lib/python3.6/dist-packages (0.4.4)
Requirement already satisfied: uritemplate<4dev,>=3.0.0 in /usr/local/lib/python3.6/dist-packages (3.0.0)
```

```
from pydrive.auth import GoogleAuth
from pydrive.drive import GoogleDrive
from google.colab import auth
from oauth2client.client import GoogleCredentials

# To access google Drive\
auth.authenticate_user()
gauth = GoogleAuth()
gauth.credentials = GoogleCredentials.get_application_default()
drive = GoogleDrive(gauth)

download = drive.CreateFile({'id': '1r0xGZe3sjlumL7IUmv-E7_OVT3t028mY'})
download.GetContentFile('RML2016.10b.tar.bz2')
```

```
# Unzipping data folder
!apt-get install p7zip-full
!p7zip -d RML2016.10b.tar.bz2
!tar -xvf RML2016.10b.tar.bz2
```

```
Reading package lists... Done
Building dependency tree
Reading state information... Done
p7zip-full is already the newest version (16.02+dfsg-6).
The following package was automatically installed and is no longer required:
  libnvidia-common-410
Use 'apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 11 not upgraded.
/usr/bin/p7zip: RML2016.10b.tar.bz2: unknown suffix
RML2016.10b.dat
LICENSE.TXT
```

```
import pickle
import numpy as np
```

```
dataFile = open('RML2016.10b.dat', 'rb')  
#use encoding parameter as data was pickled in python2  
#Data was originally structured as a dict  
dataDict = pickle.load(dataFile, encoding='latin1')  
dataFile.close()  
  
print(dataDict)
```



```

[[ 1.4560942e-03,  4.3464030e-04,  1.2096300e-04, ...,
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```

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```

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[ [-1.1149418e-02, -1.3947810e-02, 4.6615051e-03, ...,
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  -9.1015175e-03, -1.1808766e-03, 4.1477876e-03]]], dtype=float32), ('BPSK', 8
  -4.1645225e-03, -2.4220836e-03, -4.2081256e-03],
 [ 1.5371115e-03, -1.5891747e-03, 7.9586302e-05, ...,
  2.6041577e-02, 2.7627647e-02, 3.2329284e-02]],

[ [-3.1994125e-03, -1.4912151e-03, -2.2178919e-03, ...,
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 [ 9.1240825e-03, 9.0887453e-03, 6.2312046e-03, ...,
  -8.5190702e-03, -7.1330746e-03, -7.5304601e-03]],

[ [ 9.1604062e-04, 1.7826011e-03, 1.9699309e-03, ...,
  -8.1553560e-04, -1.1025474e-03, -2.4606965e-03],
 [-8.2580764e-03, -8.0695190e-03, -7.3515624e-03, ...,
  9.6857073e-03, 1.0542363e-02, 1.1822335e-02]],

...,

[ [ 1.1689989e-02, 1.1718710e-02, 1.0505233e-02, ...,
  8.4028346e-03, 9.5990663e-03, 9.7629754e-03],

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[-1.6983385e-03, -6.7916192e-04, -1.3075193e-03, ...,
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[[-4.4635430e-04, -5.3367130e-03, -8.4685301e-03, ...,
  6.7905937e-03, 4.1239192e-03, 1.3986373e-03],
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[[-5.9000356e-03, -5.4485728e-03, -4.1795708e-03, ...,
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 [ 3.1619288e-03, 3.4211695e-03, 4.9842228e-03, ...,
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[[-8.1420352e-04, 1.2918770e-03, 2.5836625e-03, ...,
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 [ 7.1467808e-03, 7.3129726e-03, 7.5894869e-03, ...,
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...,

[[-8.9050513e-03, -9.1294078e-03, -8.7807672e-03, ...,
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 [ 2.6369083e-03, 2.5359719e-04, -1.9447840e-03, ...,
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[[ 3.8910410e-03, 3.4070208e-03, 8.3462539e-04, ...,
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 [-5.1735640e-03, -5.0556702e-03, -6.5181637e-03, ...,
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[[ 2.3859723e-03, 3.9359140e-03, 5.3215469e-03, ...,
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 [ 6.3563371e-03, 6.4101950e-03, 4.6241838e-03, ...,
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[[ 0.00123764, 0.00018115, 0.00031589, ..., 0.00104717,
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 -0.00638456, -0.0079253 ]],

[[ 0.00021743, -0.00030833, -0.0005739, ..., 0.00078897,
 0.00135966, -0.00064928],
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 -0.00768368, -0.00830734]],

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  -0.00741971, -0.0070406 ]],

[[ 0.00154102, 0.00259141, 0.0017884 , ..., 0.0002058 ,
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  -0.00696315, -0.00660066]],

[[ 0.00237425, 0.00214611, 0.00170356, ..., 0.00034201,
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[[ 0.00040894, -0.0008901 , -0.00044281, ..., -0.00311718,
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  0.0048317 , 0.00395373]]],

[[ 0.00515291, 0.0096917 , 0.00784326, ..., 0.0013158 ,
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  -0.00457521, -0.00381299]]],

[[-0.00241867, -0.00096773, 0.0008811 , ..., -0.00676503,
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[[-0.00355229, -0.0087265 , 0.00215208, ..., -0.00272308,
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[[ 0.00595801, 0.00035002, -0.00240984, ..., -0.00883734,
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  0.0005581 , -0.00864044]]],

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