Community Resources for RF Dataset Sharing

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RFDataFactory: One-stop Resource for Datasets for the Wireless Community

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Introduction

- Who am I? Professor at Northeastern University. Performer on DARPA RFMLS, IARPA SCISRS, NSF PI for PAWR project office, NSF Colosseum, NSF RFDataFactory
- RFDataFactory is a platform for accessing and sharing RF-centric datasets, software application programming interfaces and tutorials for collecting and processing data from experimental testbeds and simulations. Supported by the NSF Award #2120447.
- Recently concluded workshop: https://workshop.rfdatafactory.com

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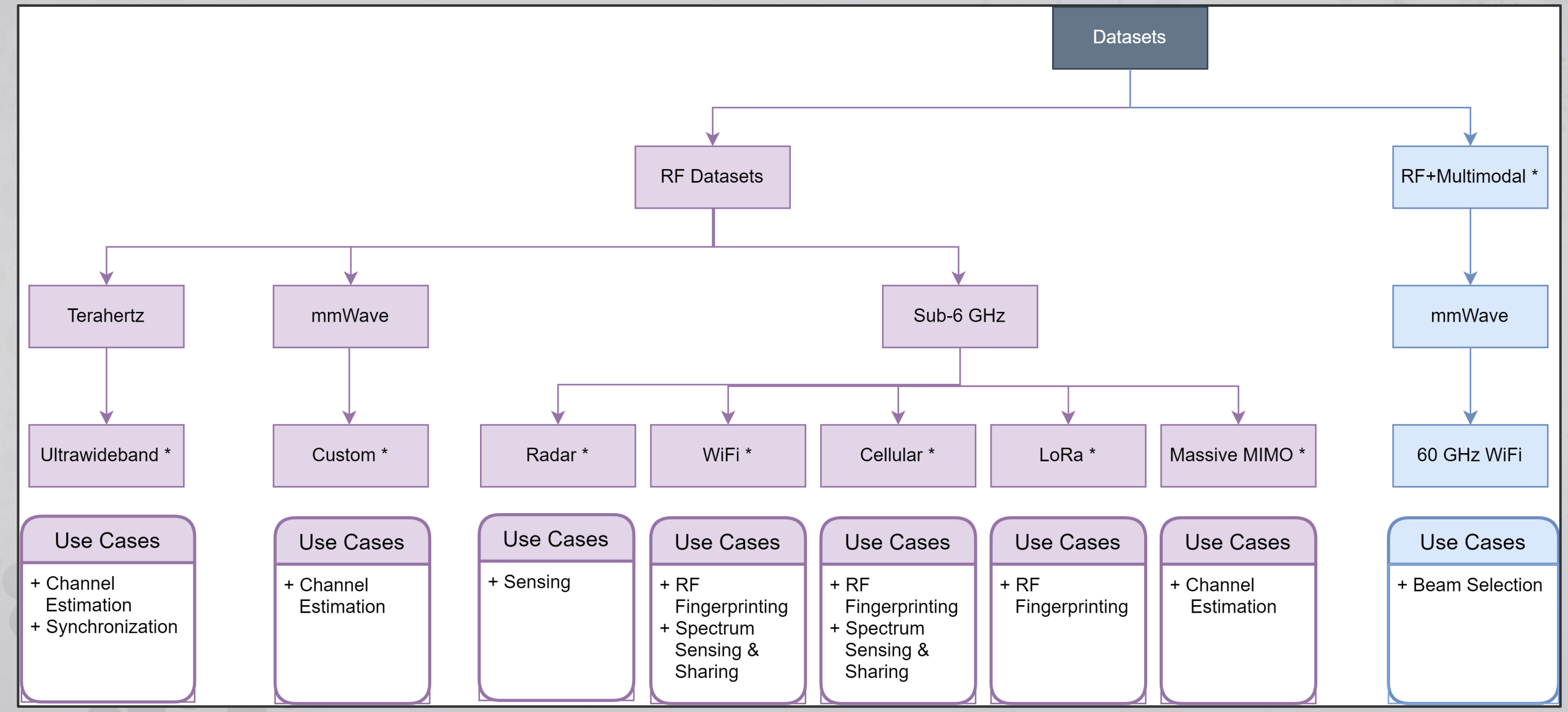
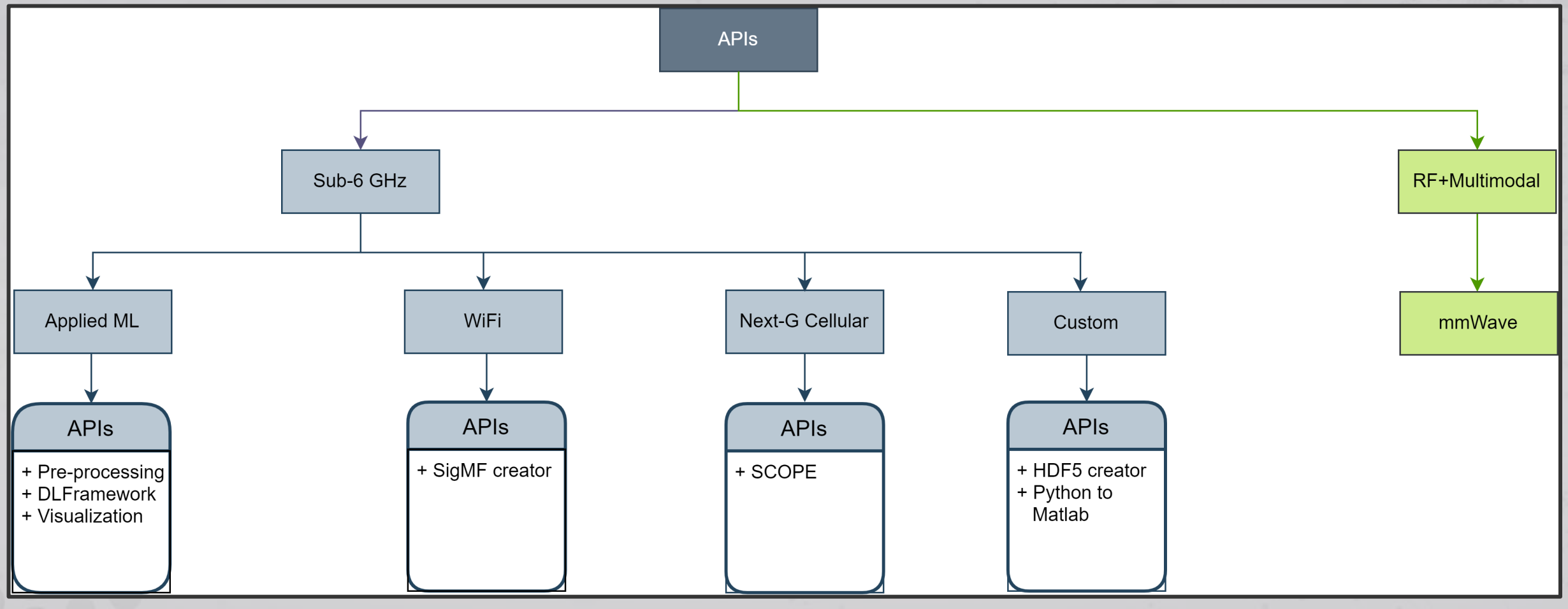
Access Visits

What Datasets Are Available in RFDataFactory?



What Software Resources Are Available in RFDataFactory?



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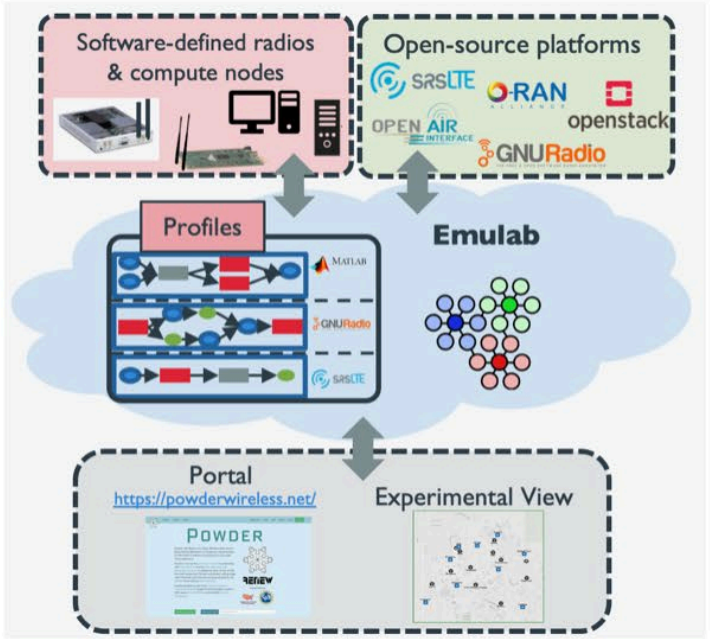
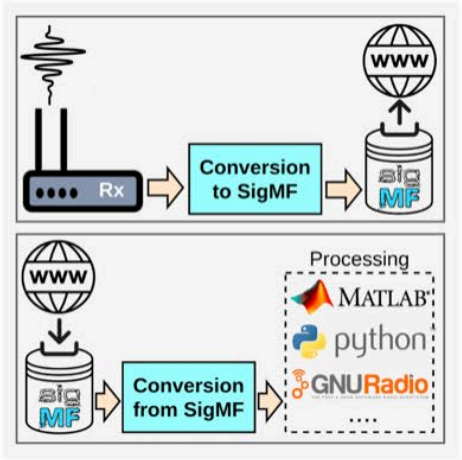


Data Collection on the POWDER PAWR Platform

Guillem Reus Muns

A step by step example on how to collect data using the POWDER platform.

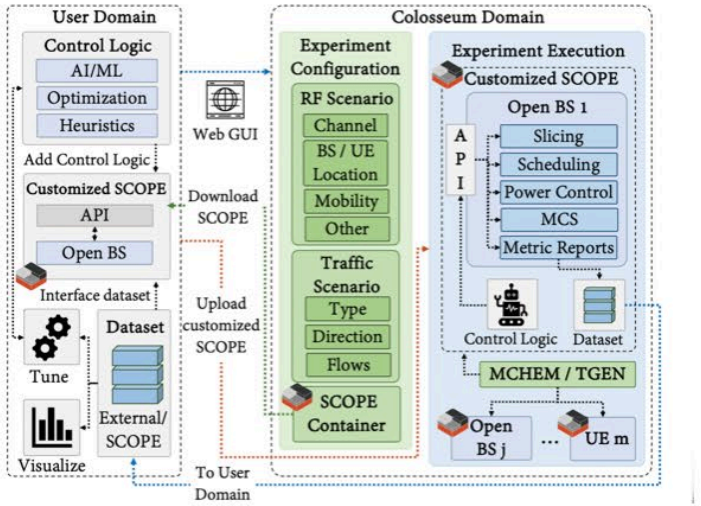


SigMF Creator

Nasim Soltani

Step by step guidline to create SigMF.

WATCH TUTORIAL



SCOPE

SCOPE is a development environment for softwarized and virtualized NextG cellular networks based on srsRAN.

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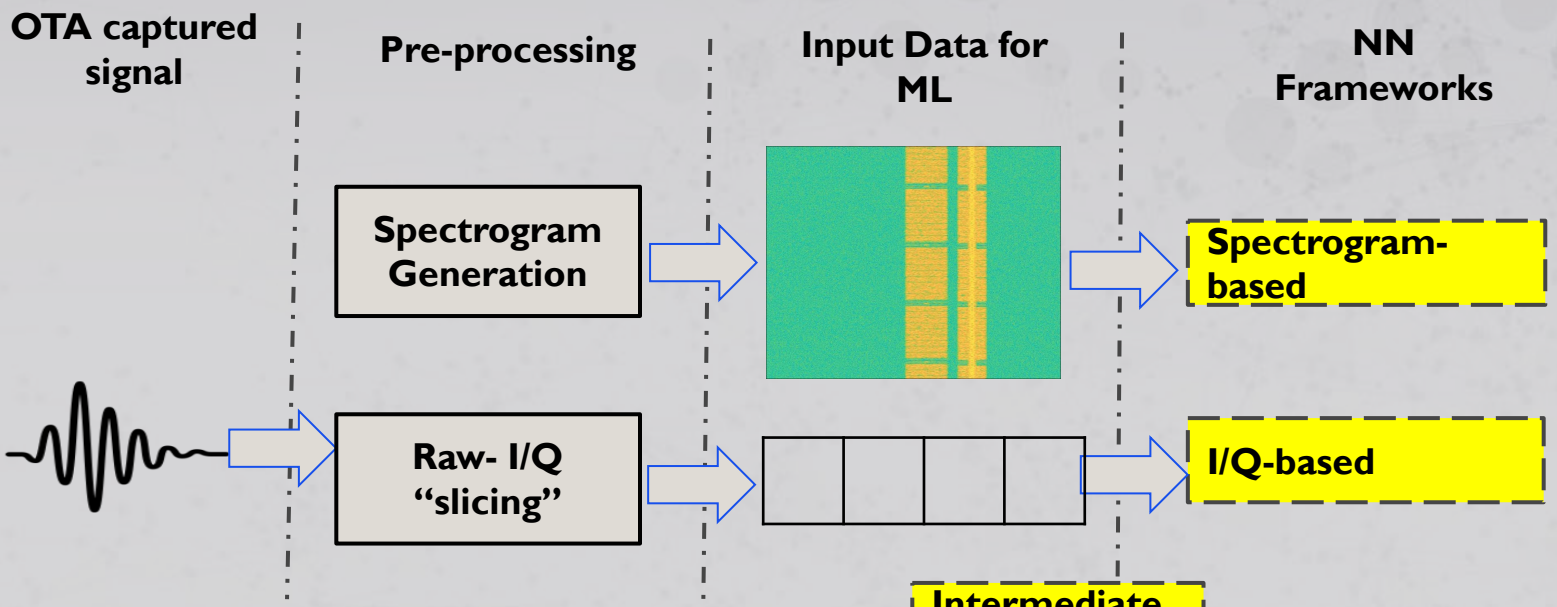
Thoughts on Spectrum Data Sharing

- Transformations at the source:
  - IQ data into another usable form, such as spectrograms
- Share features not raw data
- Is SigMF ready for the future?
  - Challenges in capturing time varying and adaptive signals



Dataset Description:

We are releasing two datasets ***a) Dataset #1 : recordings of raw IQ samples collected from over-the-air transmissions of 16 USRP X310 transmitter radios ; b) Dataset #2: recordings of demodulated IQ symbols collected after equalizing over-the-cable transmissions of 16 IQ imbalance configurations.*** In both the datasets, each recording consists of two files: a metadata file and a dataset file. The dataset file is a binary file of digital samples, and the metadata file contains information that describes the dataset. Our metadata and data format is an extension of, and compatible with the SigMF specifications .

- **Dataset #1 :** It consists of recordings of collected raw IQ samples from 16, high-end X310 USRP SDRs with the same B210 radio as a receiver. The recordings are categorized into different folders with folder name "xxft", where xx represents the transmitter-receiver separation distance in feet. Each recording has a dataset file with an extenstion of *'.sigmf-data'*, and a metadata file with an extension of *'.sigmf-meta'*. These files are named in a specific format for more intuitive understanding. For example, the dataset file "***WiFi_air_X310_3123D7B_2ft_run1***" represents
  - ***WiFi :*** --> IEEE802.11a standard-compliant WLAN frame
  - ***air :***--> medium of transmission
  - ***X310 :***--> the type of USRP radio
  - ***3123D7B :*** --> device serial ID
  - ***2ft:*** --> the transmitter-receiver separation distance in feet
  - ***run1 :*** --> the recording number
  - ***sigmf-data/sigmf-meta :*** --> the extension of dataset file/metadata file