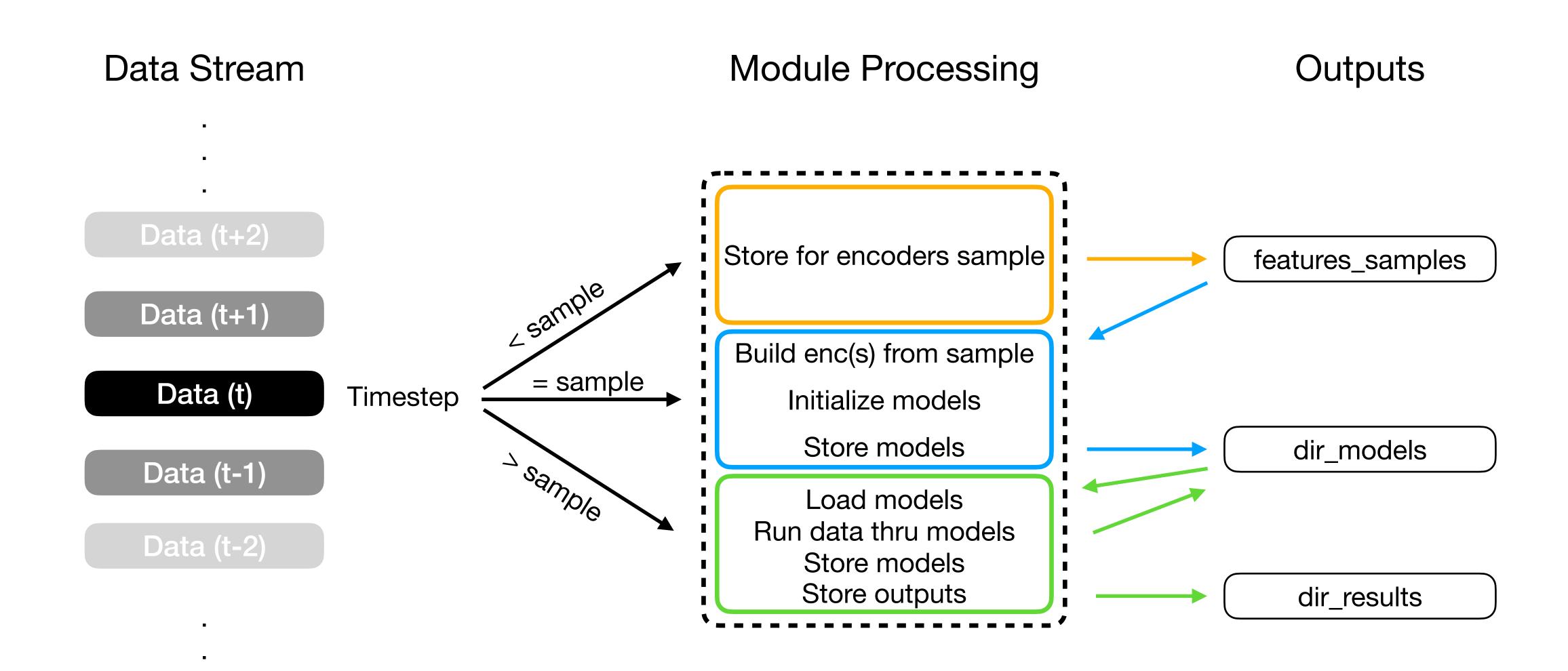
HTM.core Streamer

Python Module

Module Overview

1) Sample 2) Initialize 3) Run



Pseudocode

Main Functions

htm stream runner

- 1. Load —> Config
- 2. Load —> Batch Data
- 3. For Row in Batch Data:
 - 1. Generate —> Stream Data
 - 2. Store —> Stream Data
 - 3. Run —> stream_to_htm()

stream to htm

- 1. Load —> Config
- 2. Load \rightarrow Data
- 3. Validate —> Config
- if mode == Sample:
 - 4. Store —> Data
- elif mode == Initialize:
 - 4. Store —> Data
 - 5. Build —> Encoder Params
 - 6. Build —> HTM model(s)
 - 7. Store —> HTM model(s)
- else: (mode=Run)
 - 4. Load -> HTM model(s)
 - 5. Run —> Data thru HTM model(s)
 - 6. Store —> HTM outputs
 - 7. Store -> HTM model(s)
- 8. Store —> Config

Config Structure Set by user

Where on disk is data & models stored?

```
dirs:
    data: /where/to/stream/to
    models: /where/to/save-load/models
    results: /where/to/save/results
```

Are timestamp feature be included in models?
What's the name of timestamp feature?
What are the encoder params for timestamp?

```
Which features are modeled?
```

```
features:
    - Solar_Panel_Voltage_X
    - 3.3_Bus_Current
    - Receiver_Doppler
    - Total_Photo_Current
```

Is the htm.core predictor be active?
What is predictor resolution?
How many steps ahead does predictor go?

At what time steps are sampling/learning/running stopped?

```
timesteps_stop:
   learning: 100
   running: 110
   sampling: 50
```

Is there a model for each feature, or one model combing all?

```
models_encoders:
    minmax_percentiles:
    - 1
    - 99
    n: 700
    n_buckets: 140
    sparsity: 0.02
    timestamp:
        enable: false
        feature: satellite_time
        timeOfDay:
        - 30
        - 1
        weekend: 21
```

```
models_predictor:
   enable: false
   resolution: 1
   steps_ahead:
   - 1
   - 2
```

```
models_state:
    learn: true
    mode: sample_data
    model_for_each_feature: true
    timestep: 0
```

Config Structure Set by user

What are the params for htm.core.AnomalyLikelihood?

What are the params for htm.core.Predictor?

What are the params for htm.core.SpatialPooler?

What are the params for htm.core.TemporalMemory?

```
models_params:
 anomaly:
   period: 1000
 predictor:
   sdrc_alpha: 0.1
 sp:
   boostStrength: 3.0
   columnCount: 1638
   localAreaDensity: 0.04395604395604396
   potentialPct: 0.85
   synPermActiveInc: 0.04
   synPermInactiveDec: 0.006
  tm:
   activationThreshold: 17
   cellsPerColumn: 13
   initialPerm: 0.21
   maxSegmentsPerCell: 128
   maxSynapsesPerSegment: 64
   minThreshold: 10
   newSynapseCount: 32
   permanenceDec: 0.1
   permanenceInc: 0.1
```

Function Call Tree

source.pipeline.htm stream.stream to htm()

```
load_config
load_json
validate_config
```

```
if mode == sample:
                              elif mode == initialize:
                                                                               elif mode == run:
                                   extend_features_samples
                                                                                    load_models
     extend_features_samples
                                                                                         load_pickle_object_as_data
                                   build_enc_params
                                        get_rdse_resolution
                                                                                    run_models
                                                                                         HTMModel.run()
                                   init_models
                                        HTMModel.init_model()
                                                                                              HTMMode.get_encoding()
                                                                                                   htm.core.encoder.encode()
                                             HTMModel.init_encs()
                                                                                                   htm.core.SDR.concatenate()
                                                  htm.core.RDSE_Parameters()
                                                  htm.core.RDSE()
                                                                                              htm.core.sp.compute()
                                                                                              HTMModel.get_predcount()
                                                  htm.core.DateEncoder()
                                                                                                   htm.core.tm.activateDendrites()
                                             HTMModel.init_sp()
                                                                                                   htm.core.tm.getPredictiveCells()
                                                  htm.core.SpatialPooler()
                                                                                              htm.core.tm.compute()
                                             HTMModel.init_tm()
                                                  htm.core.TemporalMemory()
                                                                                              HTMModel.get_preds()
                                             HTMModel.init_anomalyhistory()
                                                                                                  htm.core.predictor.infer()
                                                                                                   htm.core.predictor.learn()
                                                  htm.core.AnomalyLikelihood()
                                             HTMModel.init_predictor()
                                                                                    save_outputs
                                                                                    save_models
                                                  htm.core.Predictor()
```

save_models