HTM.core Streamer

Python Module

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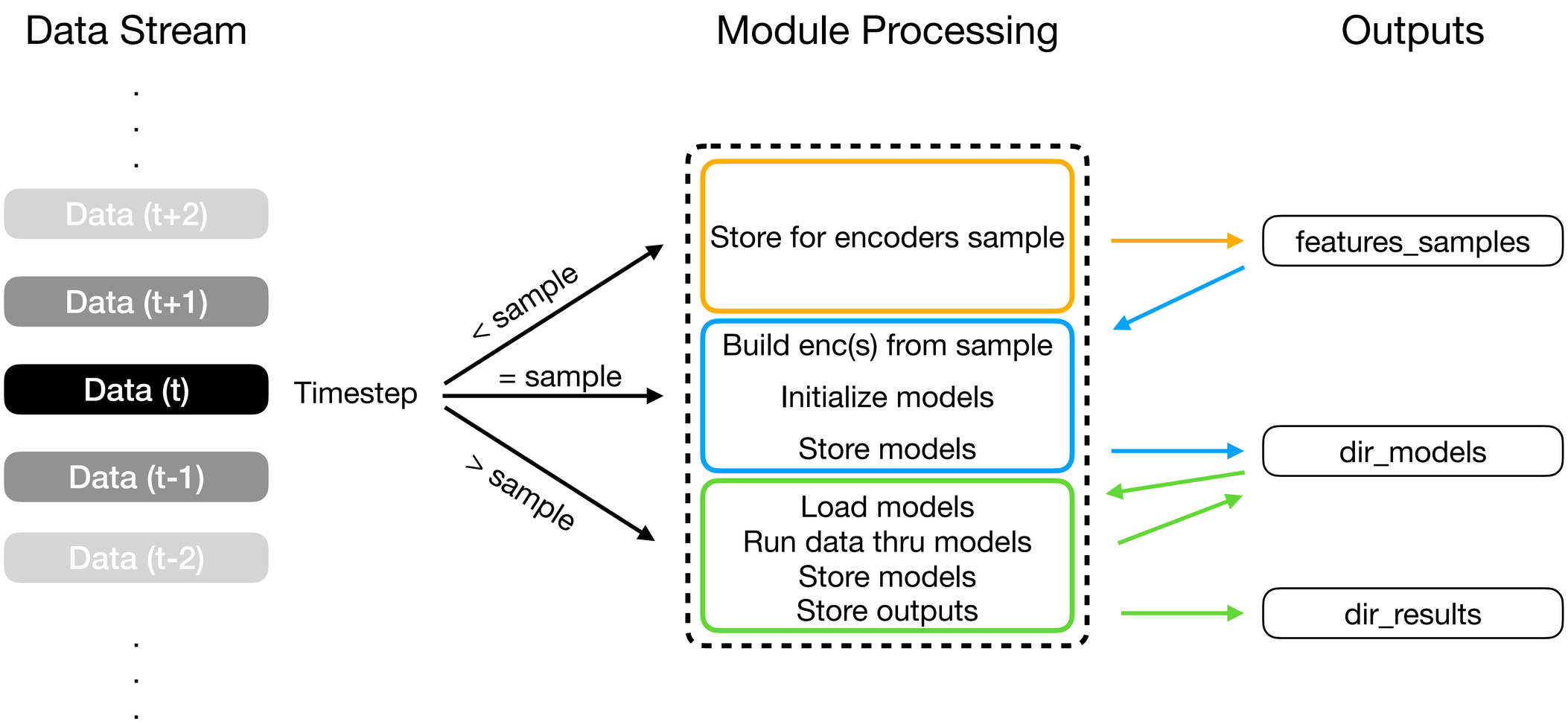
Module Overview

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 --> Stream Data
3. Validate Config

if mode == Sample:

4. Store Data

elif mode == Initialize:

4. Store Data
5. Build Encoder Params
6. Initialize HTM model(s)
7. Store HTM model(s)

else: (mode=Run)

4. Load HTM model(s)
5. Run Stream 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?

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

Which features are modeled?

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

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

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

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

```yaml
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
```

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

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

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

```yaml
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?

```yaml
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
    synPermConnected: 0.13999999999999999
    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:
    extend_features_samples

elif mode == initialize:
    extend_features_samples
    build_enc_params
        get_rdse_resolution
    init_models
        HTMModel.init_model()
            HTMModel.init_encs()
                htm.core.RDSE_Parameters()
                htm.core.RDSE()
                htm.core.DateEncoder()
            HTMModel.init_sp()
                htm.core.SpatialPooler()
            HTMModel.init_tm()
                htm.core.TemporalMemory()
            HTMModel.init_anomalyhistory()
                htm.core.AnomalyLikelihood()
            HTMModel.init_predictor()
                htm.core.Predictor()
    save_models
        save_data_as_pickle

elif mode == run:
    load_models
        load_pickle_object_as_data
    run_models
        HTMModel.run()
            HTMMode.get_encoding()
                htm.core.encoder.encode()
                htm.core.SDR.concatenate()
            htm.core.sp.compute**()**
            HTMModel.get_predcount()
                htm.core.tm.activateDendrites()
                htm.core.tm.getPredictiveCells()
            htm.core.tm.compute()
            HTMModel.get_preds()
                htm.core.predictor.infer()
                htm.core.predictor.learn()
    save_outputs
    save_models