SOLAR ENERGY
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Data Preprocessing

Profiler for Synthetic generation

Pacific Northwest National Laboratory

Workflow

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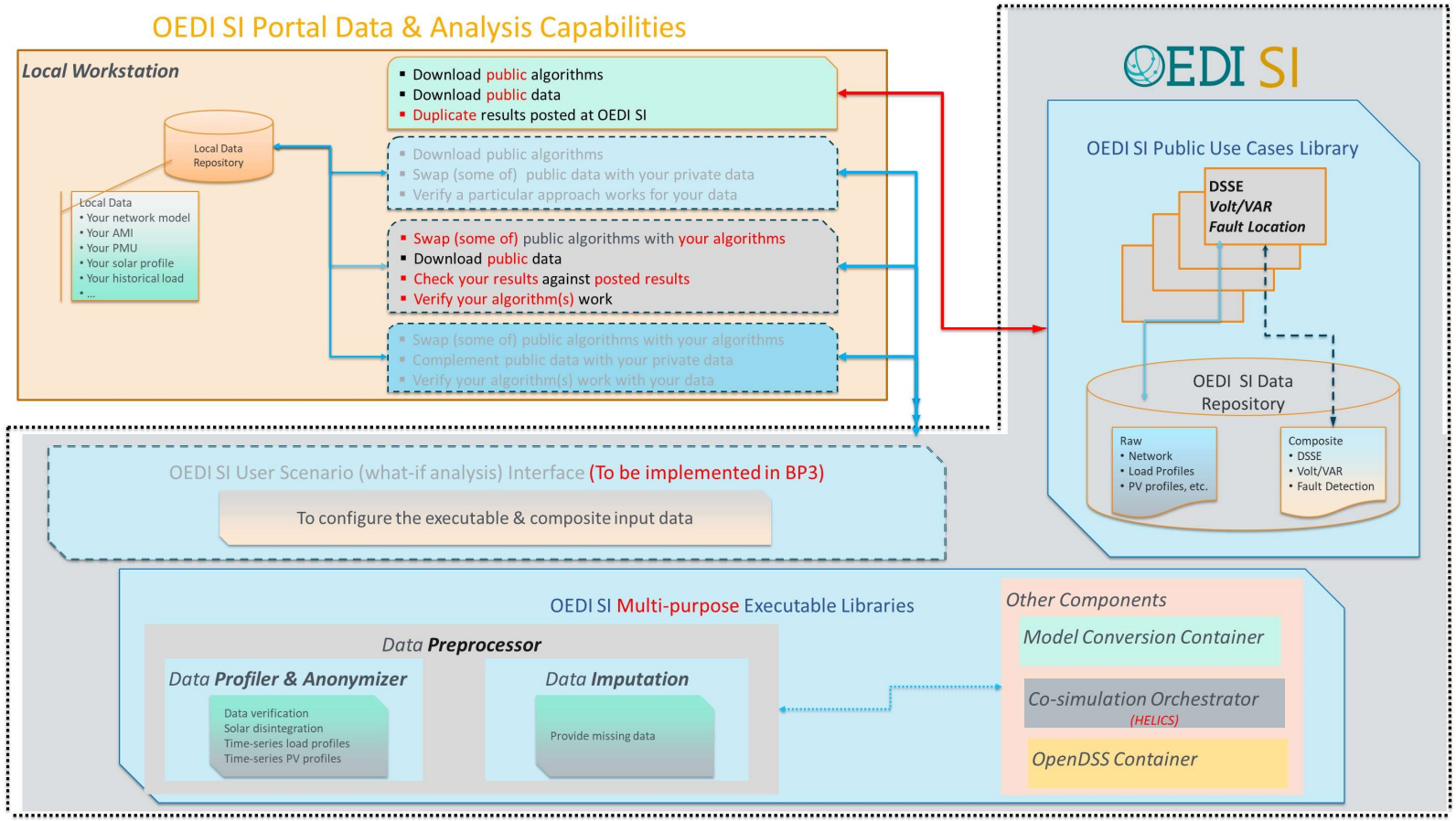

Outline

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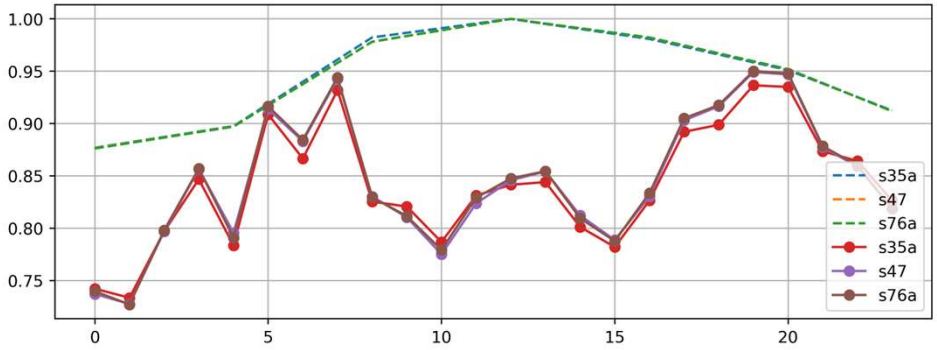
- Input Data:
  - OpenDSS model
  - Load/Solar profiles
- Extract features into homogeneous feature sets
- Select week subset from profile as training on a full year takes dramatically more time
- Split feature sets into rolling window for training
- Train TSGM:TimeGAN on rolling windows
- Generate synthetic data from trained model
- Evaluate synthetic data



Input Data

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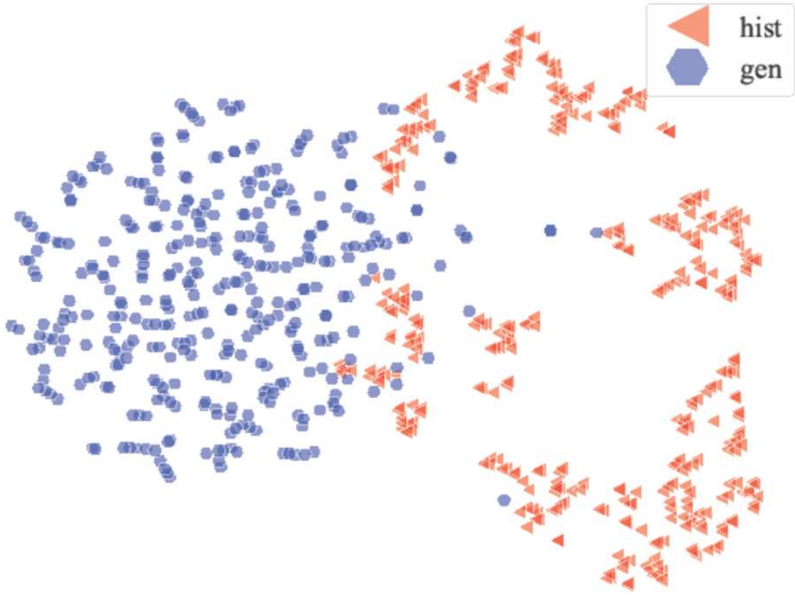
- OpenDSS Model:
  - Loads: kV, kW, loadshape
  - Photovoltaics: kV, kVA, pvshape
- Each homogeneous set is combined into a single dataset to reduce model training required for data synthesis.

Metrics

- Maximum Mean Discrepancy (distance distribution)
- t-SNE embeddings visualize



Output

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- Returns folder with synthetic loadshape/pvshape for each feature found in the input data.
- These profiles directly replace the original profiles.