MindSynchro

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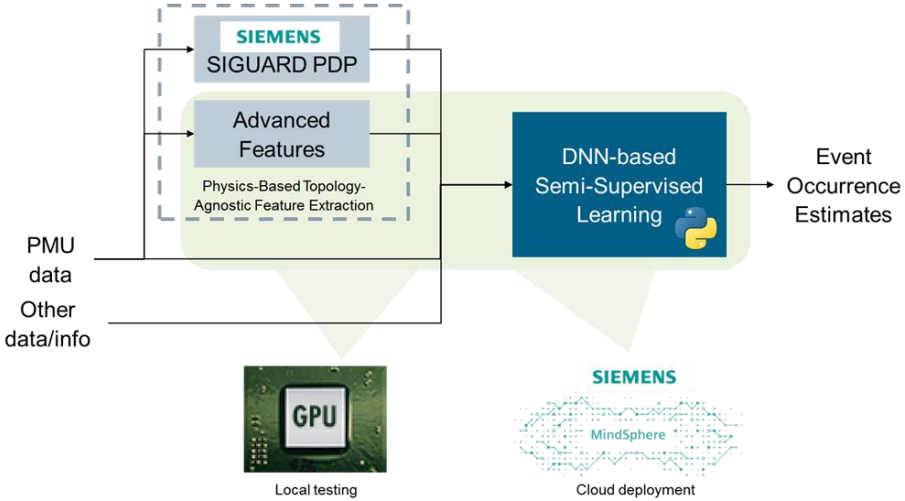
The 2nd IEEE International Conference on Smart Grid Synchronized Measurements and Analytics (SGSMA) *Virtual Event | May 24-27, 2021*

Project Summary



- Goal: detect events which are relevant to grid operation using machine learning methods applied to big data from phasor measurement units.
- Impact: the project will provide ML-based big data analytics tools to make the power grid more resilient and reliable.
- PI: Bruno Leao (Siemens Technology US)
- Partners
  - Industry: Siemens Digital Grid, Siemens Process Automation
  - Universities: SMU and Temple
- Project Funding: $1MM ($700K federal)
- Duration: 18 months (+6 months no-cost extension)
- Awarded Sep. 9th, 2019

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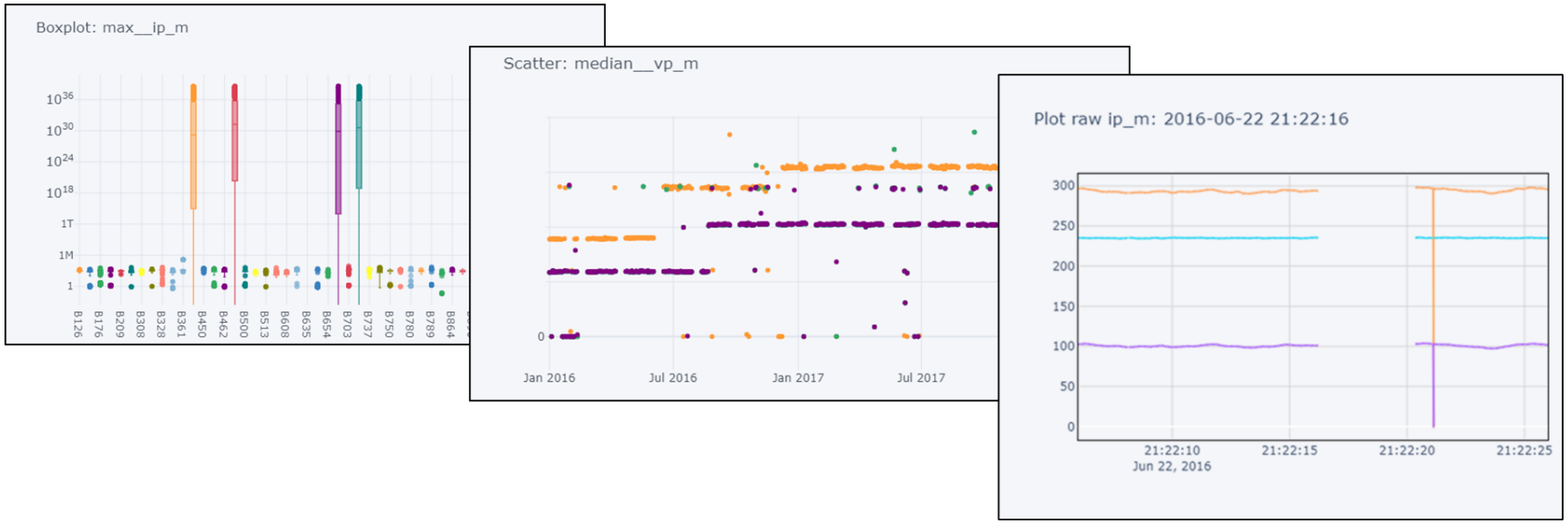
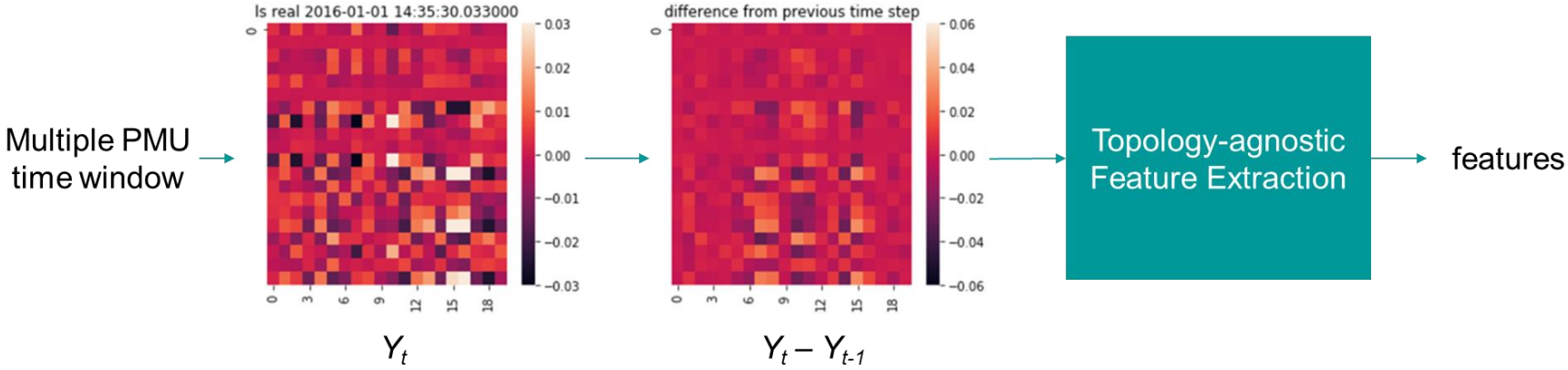
SMU

Data Quality / Pre-processing



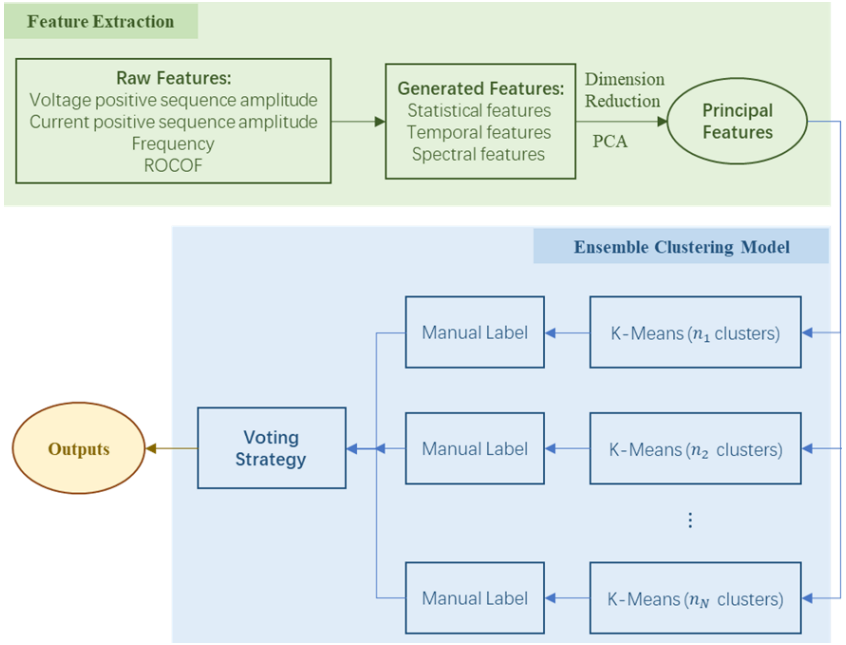
B. P. Leao et al. “Big Data Processing for Power Grid Event Detection”, IEEE Big Data 2020

Physics-based Features



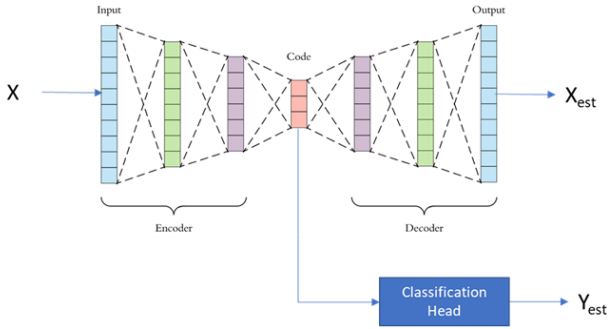
Y. Du et al. ”Physics-Based Feature Extraction from Bulk Time-Series PMU Datasets for Event Detection”, IEEE PES GM 2021 (Accepted)

Labels

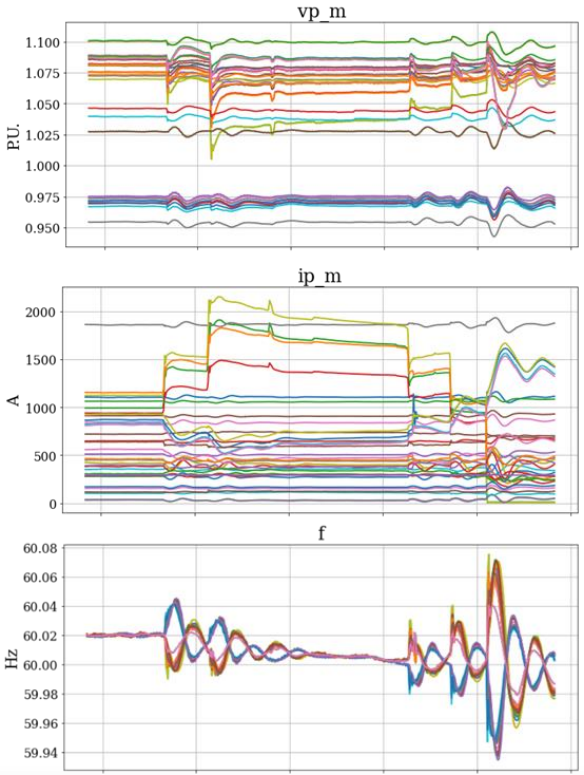


T. Lan et al. ” Unsupervised Power System Event Detection and Classification Using Unlabeled PMU Data”, IEEE ISGT Europe 2021 (Submitted)

Results and Findings



Model Type	#Labeled (P/N)	Accuracy	Precision	FAR
Short circuit	1878 / 296898	99.83%	94.46%	0.03%
Short circuit with features	1983 / 284876	99.87%	96.28%	0.02%
Trip no short circuit	6258 / 271117	99.12%	88.03%	0.22%
Loss of generation	11226 / 302824	99.99%	99.87%	0.005%



Thank You!

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