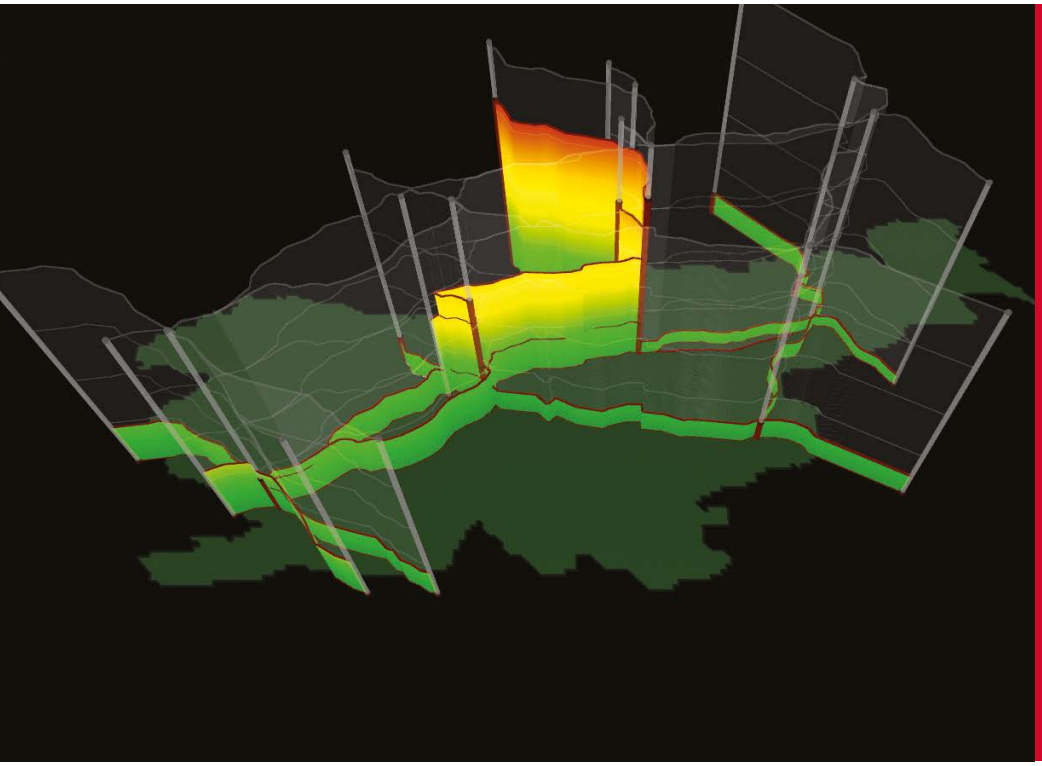
GEMALOGIC®

FLEXIBILITY

SUMO DTR



- Dynamic Calculation of Power Grid Operational Limits
- Short-term Load Forecast and Recognition of Critical Power Lines
- Power Line Rating Calculation based on Real-time Conditions
- Weather Conditions and Forecasts
- Alarms and Alerts
- Easy to Understand Visualization

SUMO provides real-time and short-term forecast assessment of the operating limits of power grids. It improves the flexibility and efficiency of the power grid's operation without compromising the reliability and safety of the network, especially in cases of increased power flows through the existing power grid infrastructure.

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Maximum ratings (operating limits) of electric grid elements such as power lines, cables and transformers are calculated on conservative presumptions of weather parameters and are traditionally set static throughout the year. SUMO provides dynamic calculations based on real-time data which in turn provide actual line ratings. The actual line ratings give the potential to improve the efficiency of power grid utilization and the flexibility of the network operation without affecting the reliability and safety of the network operation, especially in cases of increased power flows through the existing electric grid infrastructure. This allows network operators to avoid unnecessary load sheds or costly re-dispatching maneuvers.

DYNAMIC THERMAL RATING

SUMO calculates the dynamic thermal ratings based on real-time power grid data and short-term weather forecasts. Additional data used to calculate thermal ratings include topological data, physical properties of transmission line, and estimated weather conditions along the power line.

WEATHER DATA AND WEATHER FORECASTING

A meteorological model is used to determine the weather conditions along the transmission line corridor. On-line weather measurements are gridded using a micro-scale weather model and terrain elevation data. The weather forecast is calculated for up to 3 hours ahead. In case of a weather situation which could potentially lead to power line outages (thunderstorms, high wind speeds, high air temperatures), the network operator receives real-time warnings about these weather conditions.

POWER LINE LOAD FORECAST AND RELIABILITY ANALYSES

The SUMO power line load forecasts are calculated periodically for up to 3 hours ahead based on several parameters and synchronized to the 6 weather forecast time horizons. The power line load forecast is estimated based on the load and production forecasts using real-time measurements of power nodal injections across the power grid and a time series of other influential factors. SUMO periodically calculates or uses existing SCADA/EMS N-1 contingency analyses based on real-time and forecasted grid conditions and power flow. SUMO provides reliability analyses considerably quicker compared to other systems, using Power Transfer and Line Outage Distribution Factors.

VISUALISATION (ODIN-VIS PLATFORM)

ODIN-VIS is a visualization platform that provides a rapid and easy to understand representation of SUMO results. The platform enables data visualization in real time, as well as historical data from the archive, the results of simulations, and the difference between a simulation and real-time conditions. The visualization is clear, understandable, and easy to use.

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FEATURES

- Real-time dynamic thermal (line) rating
- Real-time and short term-forecast of power line load
- Evaluation and forecast of weather conditions along the power line corridor
- N-1 contingency analyses
- Line outage distribution factors
- Power system transparency
- Visualization of power line conditions

INPUTS

- SCADA measurements
- GIS (geographical data)
- Topological data
- Meteorological models
- SCADA dataset
- Physical properties of power line
- Weather measurements

OUTPUTS

- Maximum allowable current
- Power line temperature
- Allowed operation time on maximum load

ALARMS AND ALERTS

- Alarms and Alerts
- Exceptional weather conditions
- Maximum power alert
- Emergency alerts

VISUALIZATION

- Rapid and easy to understand
- 3D/4D visualization
- Priority ranking
- Color display to facilitate reading

IT INFRASTRUCTURE STANDARDS

- OS independent (Windows, Linux, AIX)
- DB independent (Oracle, MS SQL, DB2)

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