

Project 2.4 Visual Analytics Platform for Large-Scale Hierarchical Control System Data

George Chin, Erin Fitzhenry, Dennis Thomas, Bibi Raju, Nhuy Van



Proudly Operated by **Battelle** Since 1965

Objective

Develop and deploy novel control system-specific visual analytics platform and tools that enable control researchers to:

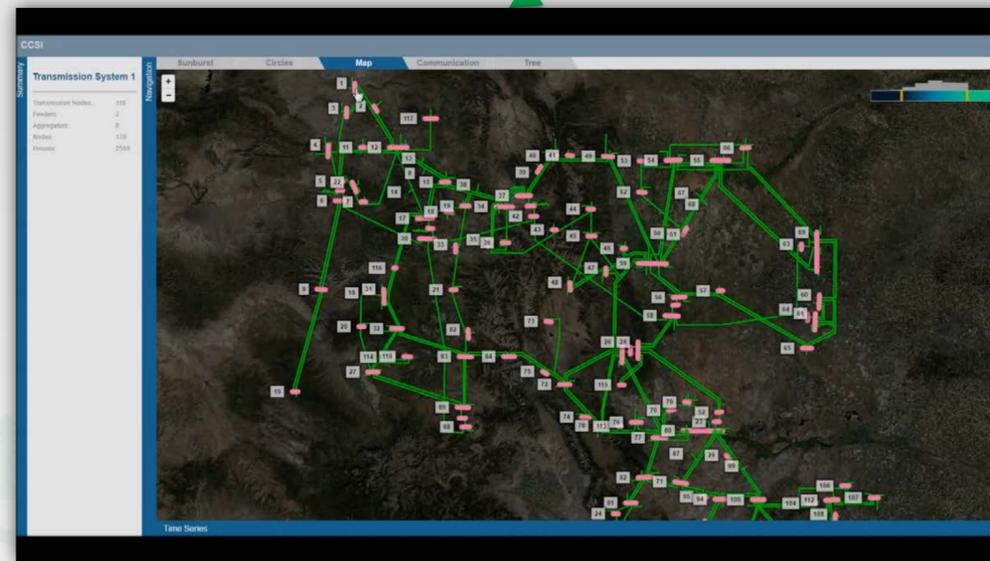
- Visually test, validate, and refine control systems
- Effectively explore big data to identify critical events, relationships, and patterns
- Access, evaluate, and compare experimental results at multiple levels of detail and aggregation
- Understand how controls manage, impact, and interact with devices, agents, and systems
- Discover temporal and spatial control system behaviors and patterns

Capabilities

Visual analytics capabilities allow control researchers to:

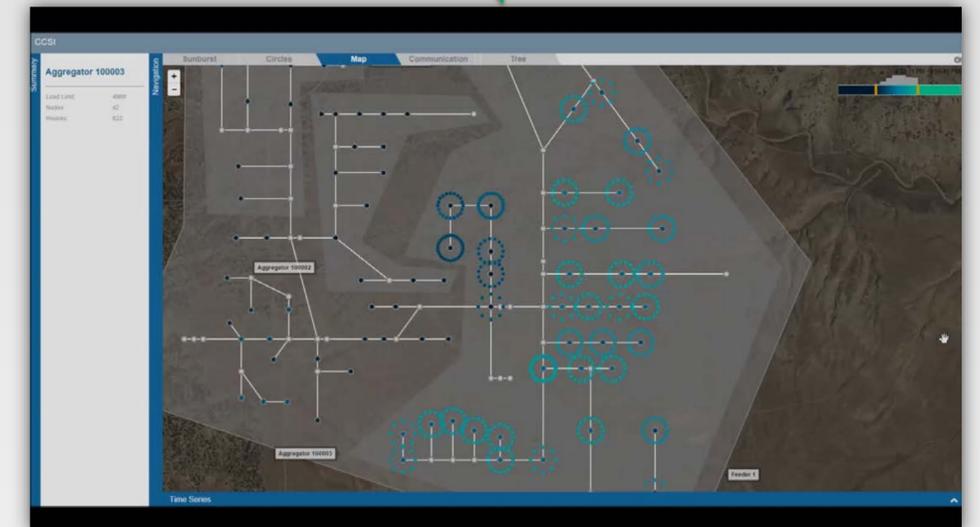
- Visually map experimental data to useful control system topologies and structures
- Visually compare data across experiments, systems, and subsystems
- Animate data to reveal temporal and spatial patterns and behaviors
- Display dynamic control system communications
- Efficiently ingest and visualize large-scale data on demand
- Automatically and visually alert researchers to critical events, conditions, and anomalies

Results



Control researchers may more efficiently navigate across different topology or spatial resolutions and only ingest data and view entities/elements relevant to the current view

Control researchers may more easily define thresholds on measurements to automatically alert critical conditions and reveal temporal system behaviors



More homes (in yellow) are reaching critical temperatures over time



New side-by-side comparison view allows control researchers to compare results from different experiments animated across simulation time