OASIS

Overarching Scientific Information System

Project Information and Data Management Systems for Scientific Experiments

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OASIS

Overarching Scientific Information System

PROJECT INFORMATION AND DATA MANAGEMENT

A framework of components to centralize all of a projects information and data in one location

INTERNET BROWER APPLICATION

- Easy and fast with the feel of a desktop program
- Efficient review, evaluation and reporting
- Documents, chart, tables and data can be downloaded to your computer
- Works on any PC, Mac or tablet's running a modem Web browser

POWER BY A HIGH-SPEED OPEN SOURCE PostgreSQL DATABASE

- Runs on an Internet server
- Fast with large data sets (billions of measurements)
- No licenses required

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Ideal for scientific experiments and projects with more than one data source and numerous data

DATA MANAGEMENT

- Automatically collects data from multiple contractors
- Imports data with multiple file formats, multiple recording rates
- Wide range of sensor types, fiber optic DTS, TDR, chemical analyses
- Verifies, evaluates and appends data; available within minutes
- Measurements are assigned “metadata” providing information about quality, alarms, etc. No measurements are deleted

DOCUMENT CONTENT MANAGEMENT

- Centralize all project documentation: MS Word, PowerPoint, PDF, Spreadsheets, Photos, Videos, more
- Complex and complete (Google like) searches

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Keeps the project under control

PROJECT SUPERVISION

- Overview the monitoring data collection
  - Text message (SMS) and email alerts sent when data go missing
- Measurement alarms
  - Low, high and delta (change) warning and critical limits
  - Custom alarms for critical systems
  - Text message (SMS) and email and alerts with charts and tables
- Sensor health overview
  - Number of sensors missing data, out-of-range, exceeding alarms, etc.
- Daily project status summary email with charts and tables

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System administration, security and maintenance

SYSTEM SUPERVISION

- Password controlled access
  - User password and access level (rights) set by administrator
  - User activity logged
- Access to menu items and data can be restricted to only authorized personnel
- System available over the Internet or only from within your network
- Automatic system backups, field data archive
- System requires very low maintenance
- Database server can be managed/hosted remotely or locally on site

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Dynamic and responsive charts and tables

WORK EFFICIENTLY

- Easy, fast and efficient review, evaluation and reporting with the feel of a desktop program
- Charts (2D and 3D) are interactive and provide a fast fluid user experience
  - Plot only valid or all data; multiple axes with automatic or manual scaling; scroll and zoom; show measurement values under cursor, etc.
  - Edit chart text (titles, axis labels, legends) directly on the chart
  - Customize plot trance lines, symbols, colors
  - Charts can be downloaded as a graphic file
- Data tables are generated quickly and are dynamic
  - Data can be searched; columns can be sorted, rearranged or hidden
  - Table can be downloaded as a CSV or XLSX file

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Optimized design makes the system powerful and fast

SYSTEM DESIGN

- Database design extends GIS by modeling the experiment in 3D space
- Custom geometric objects and operators use linear algebra to work with the data and calculate spatial relationships between objects
- Spatial design allows investigators to discover relationships and connections easily overlooked with only a 2D perspective
- R statistical package provides a wide range of statistics on the data
- Enter manually measured data and upload documents quickly and efficiently
- Proven in the real-world with Nagra's FE experiment in Switzerland
  - More than 1 million new measurements per day
  - In excess of 1.8 billion records
- System can be highly customized to meet a project's needs

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PROJECT INFORMATION AND DATA MANAGEMENT

Overview, Workflows, Virtual sensors: Use data effectively

OVERVIEW

- Diagrams of the experiment allow a quickly overview
  - Mouse over sensor icons to see current values. Click icons for charts and tables

WORKFLOW

- Workflows visually show the data flow for your report with popup windows making the selection of sensors and data simple (no SQL is needed)
  - Select measurements temporally (time interval) and by sensor, parameter, contractor and spatially (proximity to boundaries, boreholes, etc)
  - Save and load workflows to quickly make plots, tables or export again

VIRTUAL SENSORS

- Calculated results from algorithms of mathematical expressions and sensor measurements. Plot and reports virtual sensors with real sensors

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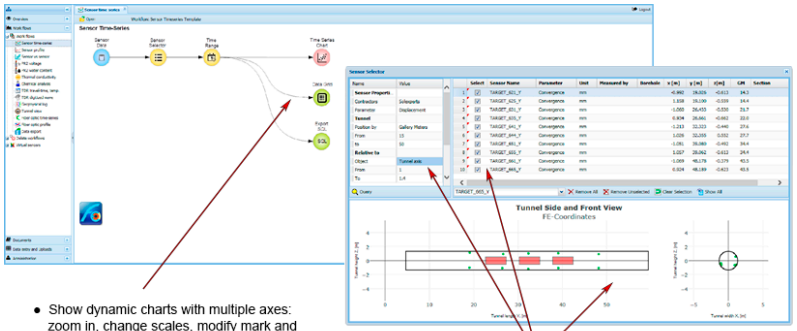
Overarching **S**cientific **I**nformation **S**ystem

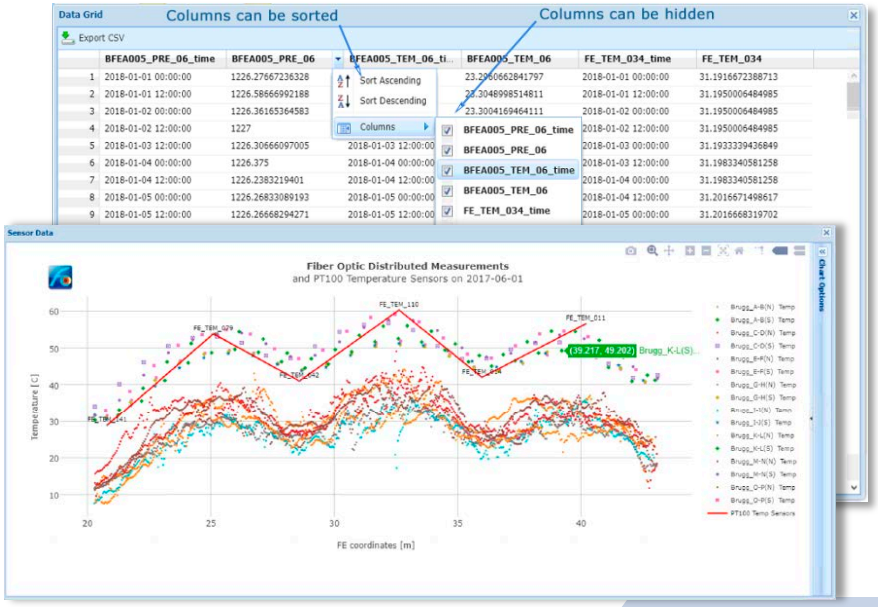
PROJECT INFORMATION AND DATA MANAGEMENT

Workflows make selecting and report measurement easy

WORKFLOWS



- Show dynamic charts with multiple axes: zoom in, change scales, modify mark and line types, modify text.
- Export the SQL command used to retreive the data for use or modification within the database or in MS Office, Open Office and other programs providing an ODBC connection.
- Drilldown to quickly focus on just the desired sensors: specify parameters, query, choose some results, and then specify other parameters, query and choose again.
- View location of selected sensor



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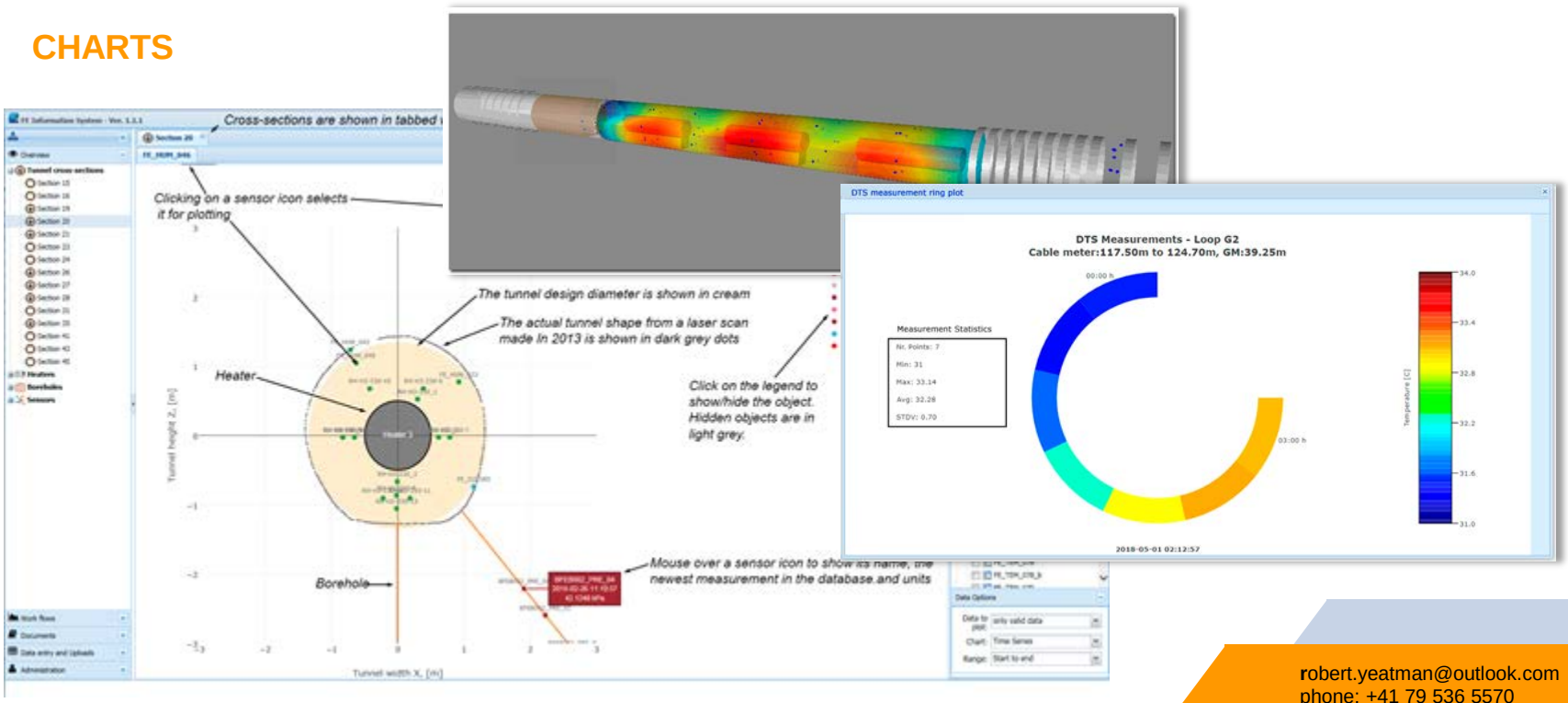
PROJECT INFORMATION AND DATA MANAGEMENT

Project overview diagrams are dynamic – draw using the system data

CHARTS



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PROJECT INFORMATION AND DATA MANAGEMENT

OASIS allows you to leverage information making your investigation more cost effective

BENEFIT

- OASIS is simple, robust, fast, user-friendly and easy to maintain
- QASIS centralizes all of a projects information and data in one location
  - Data traceability is improved
  - Data are described with rich metadata and become searchable, retrievable and interoperable
  - The chance of multiple versions of the same data existing are reduced
- By linking data sets across different systems the complexity and nuances of data relationships can be discovered
- The spatial 3D design allows investigators to discover relationships and connections in data that could be easily overlooked with a 2D perspective

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OASIS: Spend your time investigating the data

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