ControlPlan™

Optimal Planning in Production Networks

Princeton Satellite Systems ControlPlan solves complex, multi-constraint problems to support the decision-maker

Capabilities

- Rapidly develop user-defined courses of action in a complex decision space.
- Optimizes production networks for a wide variety of industrial applications.
- Robust plans account for uncertainty in the model and data.
- Supports collaborative, networked planning.
- Service oriented client server architecture.

ControlPlan is user-centric, decision support software that produces courses of action within complex decision spaces. The software uses a flexible framework with optimization libraries to leverage the right mathematical tool for each problem.

Production Networks

A problem frequently occurring in the chemical process industry is the modeling of multi-purpose plants with reactors that can be operated in different modes[1]. It is possible to produce several products in each mode according to recipes leading to a general mode product relation: in a certain mode several products are produced and a product can be produced in different modes. A changeover is necessary to switch modes with a resulting loss of production time. Planning problems of this type, where the production of an item implies a discrete event are called sizing problems.

What ControlPlan Does

ControlPlan produces optimal production plans in the form of courses of action that satisfy the demand given a set of constraints. Courses of action can be developed to accommodate short-term spikes in production. For example, in a chemical system tank storage is minimized and the needs for tank stock levels can be determined. ControlPlan also finds bottlenecks in the plant and delivery system allowing for long-term planning. The models provide a starting point for many industrial applications.

[1] C. H. Timpe, J. Kallrath , “Optimal planning in large multi-site production networks”, European Journal of Operational Research 126 (2000) 422±435

ControlPlan

- User-Centric
- Mission Focused
- Proven capability developed under Navy's Program Executive Office Space Systems
- Optimization engine solves a wide range of problems
- Client-server architecture for distributed use and collaborative planning

Princeton Satellite Systems has 20+ years of experience working with Industry, Government and the Military providing best of class solutions.

What is ControlPlan?

The ControlPlan software supports tradeoff analyses and produces multiple courses of action. The design provides users the ability to develop and store a diverse set of plans to accommodate a wide range of scenarios. Within each scenario, courses of action that meet system and mission constraints are developed using user-defined, mission-specific criteria.

Tradeoff analyses between plans are performed using detailed graphical interfaces that provide a time-phased representation and user-defined charts, tables and graphs comparing the plans. ControlPlan's efficient computational approach allows the user to receive immediate feedback to plan modifications.

User Remains in Control

ControlPlan has the human planner at the heart of its design. It allows the user to apply the most advanced mathematical tools in creating a set of optimal plans while freeing them to impart a mission focus to the plan. Features include:

- Innovative method for production problems with compact and efficient optimization
- Multiple optimization algorithms available.
- Handles any form of constraint or dynamical system.
- Provides multiple courses of action that highlight different options to the user.

Comprehensive Solution

ControlPlan generates optimal production plans for a wide variety of systems. The user-centric interface provides an integrated setting for plan inputs, plan development and trade-off analyses. The client-server architecture of the planning framework supports collaboration between multiple users.

ControlPlan Deployment

ControlPlan is available as a standalone product or as a customized product to meet specific client requirements.

ControlPlan History

ControlPlan was originally developed as a planning tool for the Mobile User Objective System (MUOS) under Navy's Program Executive Office Space Systems. Called Satellite Planner for Execution and Reconfiguration (SPEAR), it optimally plans mission options for this satellite system against a variety of space-borne and ground based threats within orbit, satellite fuel and payload mission constraints.

Princeton Satellite Systems

We are an innovative engineering firm pushing the state-of-the-art in Aerospace, Energy and Control. Since the company was founded in 1992 we have been an integral part of the development of satellite control systems such as Cakrawarta-1 and Sweden's Prisma. We sell home backup power systems and EV charging stations. Our commercial software is used worldwide. We have received a wide range of patents from Satellite Control to Nuclear Fusion.

Our staff provides user-focused engineering talent in developing and applying new and innovative solutions to any set of complex problems.

For more information about Princeton Satellite Systems, please visit us on the Web at: www.psatellite.com

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