

# GSPF<sup>®</sup> – GNSS SIMULATION & PROCESSING FRAMEWORK

| EXCELLENCE IN SATELLITE NAVIGATION |

# GSPF® – GNSS SIMULATION & PROCESSING FRAMEWORK

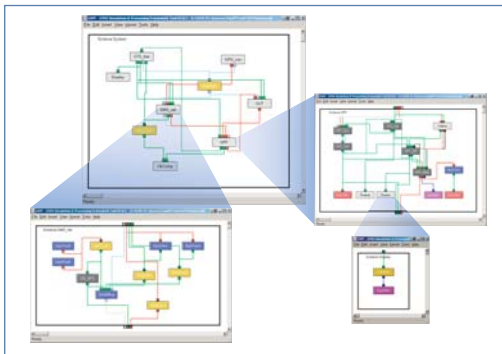


**Efficiency in algorithmic development and system design is the key to success when being at the edge between commercialisation and research. This lead to the development of the GNSS Simulation & Processing Framework. The roots of this tool reach far into history and many man-months of work now yield fruit.**

## What is GSPF®?

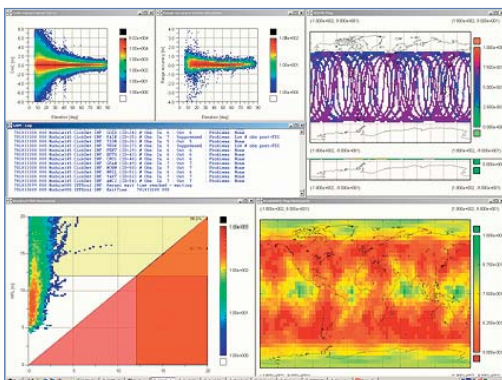
The GSPF® is a modular and highly flexible framework for development of algorithms and experimentations.

Users can benefit from a huge lot of already available algorithms and capabilities and exploit them in post-processing or real-time.



## Why “framework”?

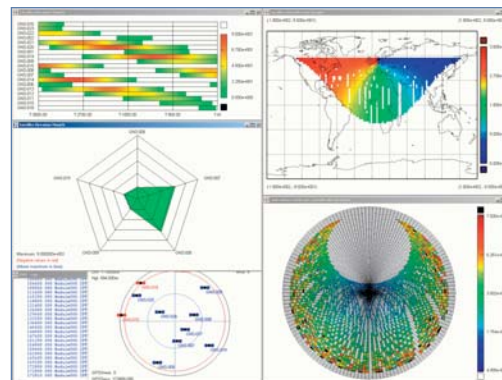
The GSPF® is not a single fixed application. Instead it provides the flexibility to design and implement any application related to the field of satellite navigation. The most important concept is the capability to allow “graphical programming,” which means that the user cannot only configure parameters but even modify the process flow of any given application. To have highest flexibility the user can even implement own algorithms and test their performance versus other candidates in some predefined environment.



## Algorithms and Features

Currently the GSPF® supports all types of analyses for integrity, user-level service volume, raw data or any type of standard processing. It can be used to investigate on GPS as well as Galileo, GLONASS or EGNOS.

It further supports all usual standard formats (including RINEX 3.0, SP3, etc.), contains algorithms for user positioning, atmospheric models, orbit determination, ambiguity resolution and even provides a sophisticated receiver model for simulations.



## References

The GSPF® is used in-house at IFEN in projects like EGNOS-V2 and Galileo and is also being used by external customers.

In the German Galileo test-bed GATE, the core element – the GATE Processing Facility, GPF – and its AIV platform are also based on the GSPF® and its networking and real-time capabilities.

Continued effort is and will be spent in the maintenance and improvement of the GSPF® software as it is seen as a key long-term development and performance assessment tool.

### Platforms

- + Windows
- + Linux
- + Solaris

### Framework Features

- + Modular (DLL/SO)
- + Highly flexible
- + Extension API for C++
- + > 450 modules available

### Processing Modes

- + Post-processing (batch and interactive)
- + Soft real-time
- + Simulation

### Sat-Nav Systems

- + GPS, Galileo, GLONASS
- + EGNOS

### Basic Capabilities

- + Standard data in/out (RINEX 3.0, IONEX, SP3)
- + Standardized module interfaces
- + Statistics
- + 2D-/3D-visualization

### Advanced features

- + Networking
- + “Graphical programming” (modification of process flows)
- + Hierarchical modelling
- + Multi-threading support

### Recommended for:

- + Research
- + Algorithm development
- + System design
- + Expert users

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