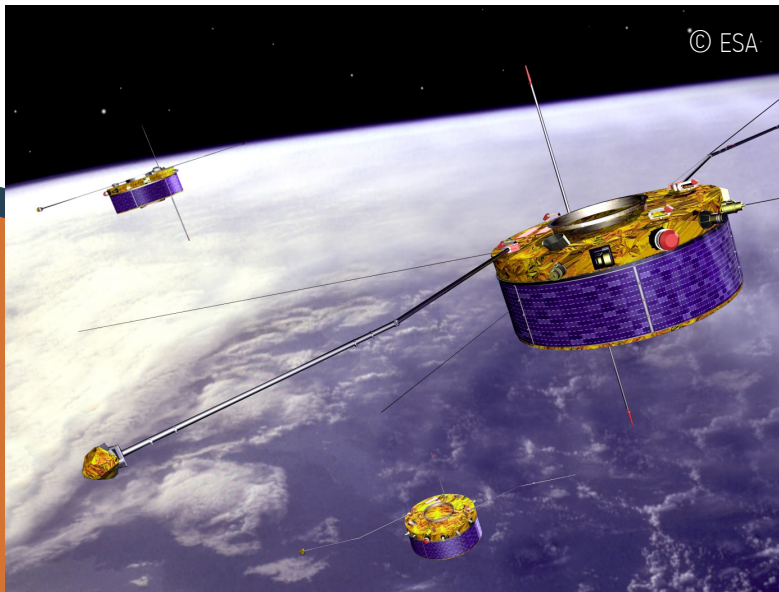


Spacecraft Simulators

Requirements, design, development,
integration & validation

EMTECH's team possesses wide experience in Software Design, Development & Testing specialized for spacecraft simulators based on Model & Component-based Software Architecture. EMTECH's team members have deep knowledge of space software engineering standards for ESA/ESOC ground segment software development (ECSS). Especially, the SMP2 standard and the Reference Architecture (REFA) introduced by ESA are adopted in the design and development to ensure model portability and reuse. By being a flexible team, different software engineering approaches, such as the typical Waterfall model, as well as Agile approaches can be followed in order to meet deadlines and deliverable requirements.



Operations & Services

EMTECH provides solid solutions in different engineering phases of an aerospace project:

- Functional Verification Bench (FVB)
- Software Verification Facility (SVF)
- Independent Software Verification and Validation (ISVV)
- Simulator for operations support (OpSim)

EMTECH's multidisciplinary engineering team incorporates strong scientific and technological experience in complementary fields, including:

- Physics
- Informatics
- Embedded Systems
- Digital Signal Processing
- Telecommunications
- Electronics
- Electrical Engineering
- Spacecraft and Ground Segment

TRUST YOUR ESA QUALIFIED PARTNER

TO DELIVER HIGH-QUALITY SPACE

SOFTWARE TECHNOLOGIES

emtech.global/space/services.html

ECSS-E-ST-40C
Space Engineering - Software

ECSS-Q-ST-80C
Software Product Assurance

ECSS-E-TM-40-07
SMP2 Simulation Modelling Platform

ECSS-E-TM-10-21A
System modelling & simulation

MISRA and BSSC
C/C++, Java, XML coding



Specifications*

Experience in SIMULUS infrastructure:

- SIMSAT development environment optimization & extensions
- SIMSAT's Graphical User Interface and Script Engine (JavaScript)
- Configuration and utilization of environmental simulation Generic Models (TNET, SIMPACK, SIMDYN, PEM, SENSE)
- Configurations and Interfacing between Spacecraft models and Ground System Models (Ground,

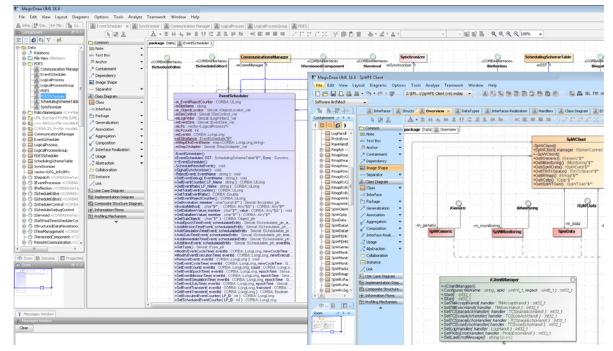
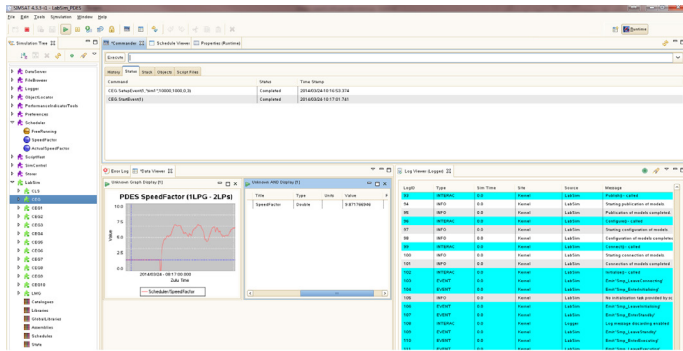
- SGM, MCS, NIS, Ground Stations)
- Spacecraft Simulator Design based on Reference Architecture (REFA & REFA-TA)

Architecture Design using UML Tools:

- Design of spacecraft simulation models for different engineering phases (OpSim, SVF, FVB, ISVV)
- UMF & EGOS-MF design platforms
- UML Design (MagicDraw)
- SMP2 standard utilization & compliance

Development Languages & Environment:

- C++ for model development
- ANSI C for On-Board software
- Java for User Interfaces
- JavaScript for OpSim utilization
- Eclipse platform
- Make, AutoMake, CMake systems
- Continuous integration with Jenkins CI
- Git for version control
- Sonar-Qube for code analysis



Today, EMTECH introduces:
PCOF - Performance Control & Optimization Framework
 Analyze simulator's performance via COTS tools, code injection and metric acquisition. Determine possible performance bottlenecks and parallelization opportunities.

C-PDES – Conservative Parallel Discrete Event Scheduler
 Utilize a conservative approach to parallelize simulation

events to multiple time horizons. Fully configurable, support for custom synchronization policies, fully compatible with current scheduling service.

By having introduced and developed the concepts and the tools for operational simulators' in ESA/ESOC, we stand both as the pioneers and experts to support such optimization activities.



*Contents are subject to change without prior notice

EMTECH GMBH
 Robert-Bosch-Straße 7
 642 93, Darmstadt, Germany
 T: +49 6151 7858 828, F: +49 6151 7858 827

EMTECH SPACE P.C.
 32, Korinthou St. & S.Davaki,
 14451, Athens, Greece
 T: +30 2106528527, F: +30 2106528717

info@emtech.global - www.emtech.global

