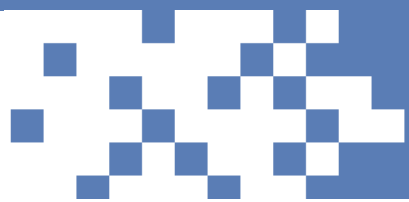
UNINOVA
INSTITUTO DE DESENVOLVIMENTO DE NOVAS TECNOLOGIAS

CA3 is part of the Intelligent Robotics Research Group at Uninova
www.uninova.pt/CA3

SEIS – Space Environment Information System for Mission Control

November



CA3
Soft Computing and Autonomous Agents

deimos
ENGENHARIA

esa

Document Identification

Title	SEIS – SWPP Workshop@ESTEC
Reference	SEIS_MEETING_006_1-0
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Presentation Summary

- The Partners
  - UNINOVA/CA³
  - DEIMOS Engenharia
- SEIS Project
  - Goals
  - Provided Services
  - Reference Missions
  - SEIS Overview
- Planning
  - Current Status
  - Scheduling & Milestones

The Partners

UNINOVA/ CA³ – Structure

- **UNINOVA – Instituto de Desenvolvimento de Novas Tecnologias**
  - **Non-profit university-enterprise research institute**
  - **Located in the Campus of New University of Lisbon**
  - **150+ researchers & engineers working in R&D**
  - **Strong mix of industrial and academic R&D**

- **CA³ - Soft Computing and Autonomous Agent Group**
  - **Integrated in the Intelligent Robotics group of Uninova**
  - **Staff: 3 Senior Researchers + 5 PhD Students + 8 full-time research engineers**

The Partners

UNINOVA/ CA³ – Research Background

- **CA³ Research Group - Technical specialization areas**
  - Fuzzy Logic
  - Decision Support Systems
  - Automatic Learning
  - Optimisation Problems
  - Evolutionary Computation
  - Data Mining
  - Multi-Agent Systems
- **Domain Application areas**
  - Aerospace System Diagnostic & Monitoring
  - Finance & Economics
  - Electronic Markets
  - Logistics
  - Ergonomics
- **Past & Ongoing Space Related Projects**
  - Fuzzy Logic For Mission Control Processes (ESOC)
  - Aurora P. – Past & Future of Knowledge Technologies (ESTEC)
  - CESADS - Centralised ESTRACK Status and Diagnostic System (ESOC)
  - EO-KES – Earth Observation Knowledge Enabled Services (ESRIN)
  - SEIS – Space Environment Information System For Mission Control Processes (ESOC)

The Partners

DEIMOS Engenharia – Structure & Background

- **DEIMOS's Origin**
  - DEIMOS is a young aerospace group founded in June 2001 by a group of professionals from Spain, Italy, UK and France with more than 20 years of accumulated space experience.
  - Offices in Madrid (DEIMOS Space) and Lisbon (DEIMOS Engenharia)
- **Performing engineering studies and SW developments for the aerospace sector in the following fields of expertise:**
  - Mission Analysis
  - Space System Engineering
  - Ground Segment Systems
  - Real time Systems
  - Space Software Systems
  - Technology Transfer
- **DEIMOS's role in the Space Industry**
  - Support to Prime Contractor
  - Engineering Studies
  - Development of Ground Segment SW Components (PDS)
  - Development of O/B SW and Independent SW Validation
  - On site support at ESRIN, ESTEC, ESOC, Villafranca and JPL

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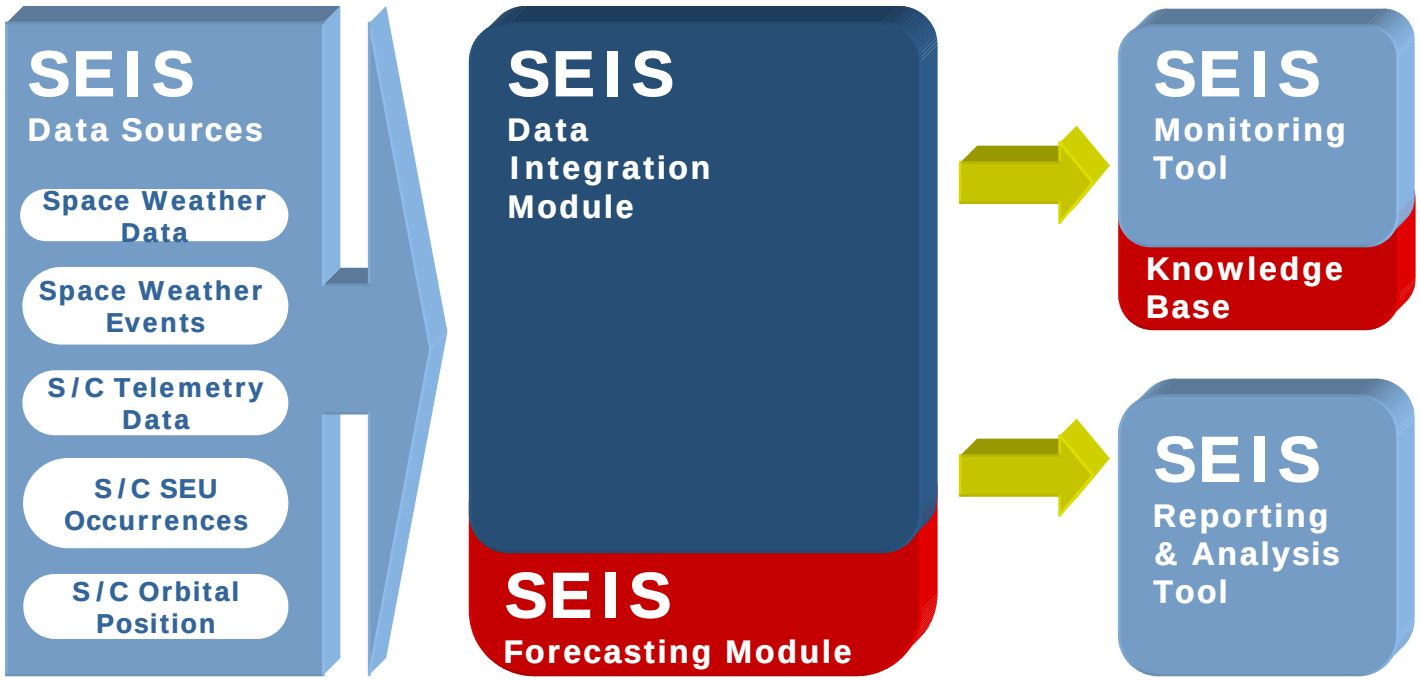
- **Goals**
  - **Provide INTEGRAL/ENVISAT/XMM Flight Control Teams at ESOC with useful past, current and future space weather and telemetry measurements:**
    - ***Increase ability to protect S/C components from hazardous events***
    - ***Thus increasing satellite scientific return by prolonging its lifetime***
- **Provided Services**
  - **Reliable integration of S/W and S/C telemetry heterogeneous data**
  - **Advanced data exploration and correlation analysis through well-established OLAP techniques**
  - **Near real-time (nowcast) monitoring of susceptible S/C instruments and alarm raising through Knowledge Based System**
  - **Advanced data forecasting methods using both physical models and Artificial Neural Networks (ANN).**

- Reference Missions
  - ENVISAT
    - Available SEU (Single Event Upset) database
    - Orbital Data
  - XMM
    - S/C Telemetry (Radiation)
    - Orbital Data
  - INTEGRAL
    - Available SEUS (Single Event Upset)
    - Orbital Data
    - S/C Telemetry

- **SEIS Overview**



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Planning

- Current Status
  - November 2003 - end of Functional Prototype phase (definition of user, system and interface requirements)
- Scheduling & Milestones
  - April 2004 – end of Design Prototype phase (design and implementation of main functionalities on a simulated environment)
  - October 2004 – end of Operational Prototype (refinement of the previously developed system and installation at ESOC facilities)
  - October 2004 till October 2005 – Assessment and maintenance support phase

CA³ Contact Information

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