**IDP: Automatic Validation of a GBAS Ground System**

**BERNS Engineers** is an innovative company working in the aviation, rail, automotive and energy sector. We have specialized on System Safety and System Engineering and work in cooperation with leading companies of the above domains.

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**Project Description**

Within the scope of a common research project of Berns Engineers and the **TUM Institute of Flight System Dynamics (FSD)**, we develop methods for the automatic validation of a GBAS (Ground-Based Augmentation System) simulation model against the respective aviation standards.

GBAS is a GNSS (Global Navigation Satellite System) approach and landing system for commercial aircraft that is intended to replace and complement existing instrument approach systems, such as the ILS (Instrument Landing System).

The standards containing the requirements towards a GBAS system have to be identified automatically and be stored in an internal database. A software tool (web parser) shall screen the open access publishing sources for the availability and validity of the selected standards and if needed, shall update the respective document in its database.

In the following, the textual requirements have to be translated into a mathematical format (formalization). Thereafter these requirements are automatically tested against a Simscape simulation model, in order to check compliance. The result of this validation process shall be used to automatically generate certification documents.

Aim of the project is to shorten the certification and validation process and to simplify the proof of compliance with the requirements.
Working Packages – IT

- Development of a text formalization algorithm
- Development of a webparser to update the respective aviation standards
- Development of internal databases

Working Packages – (Aerospace) Engineering

- Gaining System Knowledge of the GBAS System
- Gaining understanding of the certification process for air traffic navigation aids
- Processes for aviation specific software development
- Definition of requirements standards towards a GBAS ground system
- Interface definition for automatic validation of a GBAS Simscape model

Proposed Lectures

- Flight Guidance 1 (SS)
  or
- Flight Guidance 2 & Operational Flight Safety (WS)

All lectures provide important information on civil aviation, especially operations of aircraft, air navigation aids (GBAS and other), legal framework, air traffic management and technical background of air navigation systems.

Milestones

- Familiarization with GBAS & Flight Guidance
- Research into the subjects web parser and web research
- Research into natural language processing, text recognition and formalization
- Familiarization with the processes for aviation specific software development
- Development of tool requirements (formalization algorithm, web parser) and coding of the respective tools
- Test and qualification of the developed software tools
- Documentation of the development process(es)

Team Size

2-3 Students, individual application possible

Interested? Please write an E-mail with a short CV and a current transcript report to:

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