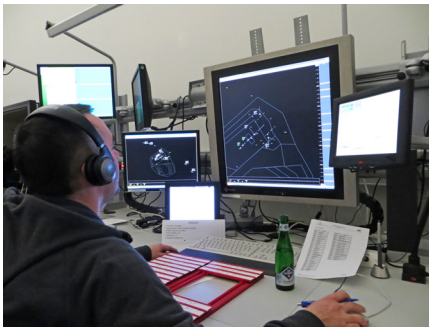# AcListant – Active Listening Assistant

Technical assistance and planning systems in air traffic control can benefit from being able to listen to the human-to-human communication. It can enable them to become more adaptive. The AcListant® (Active Listening Assistant) project implements a prototype for understanding the controller-pilot-communication.

Nowadays Arrival Managers (AMANs) are implemented to give the controller guidance advisories for optimized approaches. Information about deviations from the planned sequence is exchanged between controller and pilot via radio communication.

Trials with controllers and the AcListant prototype at the Institute of Flight Guidance in Braunschweig

The AMAN gets this information only delayed by analyzing the radar data of the aircraft. Hence, the AMAN only knows that the controller deviates but not his intentions. The target values of e.g. a descent advisory are in some cases not available for several minutes. AcListant avoids this delay by directly analyzing the controller-pilot-communication. The improvement of the AMAN is achieved by extending it with an automatic speech recognition (ASR) system.


Aims

The project aims for a reliable recognition of the controllers' intent by analyzing the voice channel. Its objectives are a command recognition rate of at least 95 percent while adapting much earlier to the controller's intent.

Features

- Implemented grammar allows deviations from ICAO standard phraseology
- Speech recognizer and approach planner adaptable to different air space structures
- Speech recognizer integrated seamlessly into the assistant system
- Recognizer output visible for the controller to adapt his phraseology which increases recognition quality
- AMAN provides distance-to-go (DTG) information to the controller
- High accuracy of speech recognizer achieved by using AMAN situation analysis

Radar screen of an AMAN without ASR support (left) and one supported by ASR (right). AMB01 gets a "DIRECT TO DL455" speech advisory. With ASR the sequence, the possible route with path stretching (green) and the trajectory (yellow) is adapted immediately.
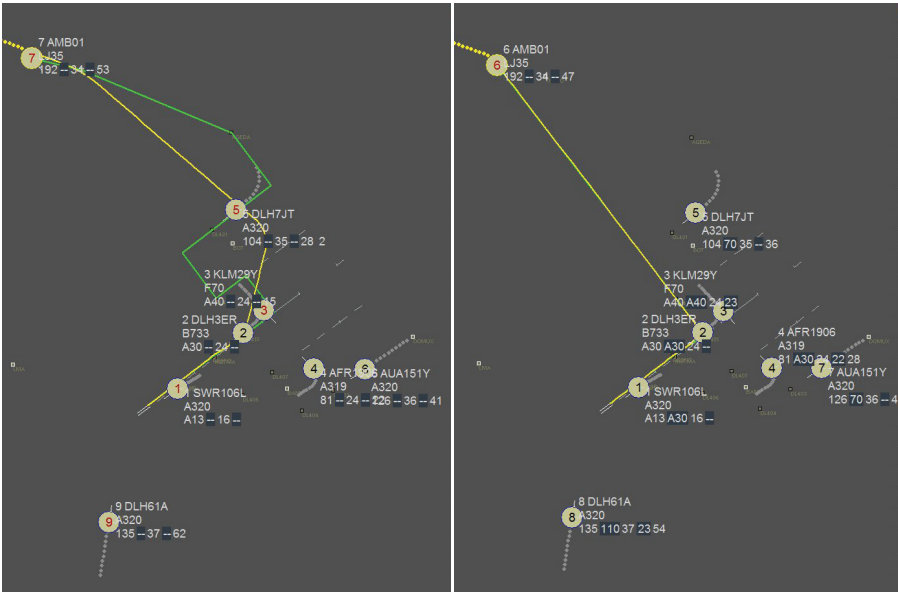
Get in Touch

Current prototypes already demonstrate the capabilities of combining an assistant system with automatic speech recognition (ASR) for the approach area of Düsseldorf.

Although AcListant® focuses on one demonstrator application for the new active listening paradigm, its concept is transferable to different ATM tasks with voice communications of operators, e.g. departure and surface management.

Adaptations to other areas with team communication via voice are possible too, e.g. railway or navy traffic. Even areas like online gaming can provide application cases in the future.

Partners and Funding

The project is executed by the DLR Institute of Flight Guidance. The Institute of Spoken Language Systems at the Saarland University contributes in the field of speech processing. Jörg Buxbaum from the DFS Deutsche Flugsicherung GmbH is supporting the project with his expertise. The project is financed by the DLR Technology Marketing and the Helmholtz Validation Fund.

AcListant – Key Facts

Aim	A convincing solution for an intent-anticipating Arrival Manager
Duration	February 2013 – April 2015
Status	Prototypes developed and adapted to Düsseldorf approach area
Patent	**Application has been filed in Germany, USA and other countries**
Partners	DLR, Saarland University (UdS) and DFS

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