



AT Voice, a product of UFA, the experts in Air Traffic Control Simulation(ATC), provides voice recognition control for UFA's ATCoach® and ATTower® air traffic control simulation systems as well as other systems, through the users' spoken commands, adding realism, ease of use and flexibility to the simulation exercise. ATVoice technology is available with ATCoach® and ATTower® and can be integrated with 3rd party simulation engines.

ATVoice Technology

ATVoice allows the ATCoach and ATTower simulation user to issue voice clearances directly to the simulated aircraft "pilots" during an exercise. In response to such voice clearances, ATVoice also generates the appropriate pilot feedback/responses using a Text-To-Speech system. Eleven distinct pilot voices are available including US and British male and female voices. As in the operational ATC setting, the simulation user talks directly to the pilots and they in turn respond.

The system incorporates the BBN AVOKE speech recognition system, a high accuracy recognition engine that is ideally suited to ATCoach, ATTower and other simulation control applications. AVOKE is a speaker independent technology, requiring no voice training or templates and is continuous, allowing the user to speak at a very rapid rate, as controllers tend to do.

The ATVoice software system is packaged as a turnkey application that communicates with the simulators via ATRadio®2, a voice over IP (VOIP) voice communications system (VCS). ATVoice can also operate directly with analog or other network based digitized speech input.

The system can be hosted on a variety of low cost Unix and PC platforms and serves as the voice communication interface between the user and the ATCoach or ATTower simulator. Systems are configured with a UFA provided jackbox that provides support for trainee and instructor headsets and push to talks. The jackbox

provides audio input/output and includes volume controls and PTT indicators.

The ATVoice system includes the following key components:

ATVoice Application

This subsystem accepts a user's spoken commands, provides core recognition functions, coordinates and applies valid commands to the simulation exercise and provides appropriate pilot voice responses.

Voice Models

The voice model represents how words or parts of words are likely to sound for a population of speakers as well as the likelihood of such sounds occurring together. The recognition engine uses the voice model to convert sounds into words. The standard ATVoice voice model supports speech generated by North American English speakers. UFA has also developed alternate voice models that support other speakers of English including German, Danish, Cantonese, Australian and New Zealand. Additional Voice Models can be developed based on collected voice recordings.

Grammar Files and Tools

The grammar file defines the allowable voice commands or phraseology that should be recognized by the system. In ATC applications, the grammar is typically defined in accordance with FAA, ICAO or other radiotelephony requirements. UFA optimizes each grammar to further increase recognition performance.

Grammar files also include airspace specific information such as aircraft callsigns, facility names and navigational aids. ATVoice provides a mechanism, ATVgen™, for dynamically adding this information to grammar files. Additionally, an interface for pronunciation of the airspace specific information is provided.



Pilot Response Files

A text-to-speech engine, AT&T Natural Voices, is used to create synthesized voices for realistic pilot responses from the simulator. ATVoice constructs and generates these responses in real time based on data from the response files and the simulation application. Eleven distinct pilot voices are available with a combination of male and females speakers with accents for US and British speech. The user can control the speech rate, volume and pronunciation of each pilot's voice.

Voice Recording / Playback

Controller / pilot input can be recorded and played back with each simulation session via ATRecord™. During a playback, audio can be stopped, started, paused, or fast forwarded.

Benefits of ATVoice

As previously noted, ATVoice is effectively used as a means of controlling the ATCoach or the ATTower simulation application, reducing or in some cases eliminating the need for human control via pseudo pilots or other means. The benefits of this approach are many:

- Lowers operating and recurring human resource costs.
- Increases efficiency and throughput, particularly during high volume exercises.
- Trains and enforces the use of proper phraseology.
- Allows the user to independently train without extraneous resources.

ATVoice Installations

UFA has over 15 years of experience and expertise in deploying ATVoice for ATC and other applications. Following are some of our customers:

- FAA Boston Consolidated TRACON
- FAA Technical Center
- US Air Force
- US Army
- US Special Forces
- US Army National Guard
- US Air National Guard
- DFS Deutsche Flugsicherung
- Thales Australia
- Various FAA CTI Colleges in the US

In summary, ATVoice is a robust, high accuracy voice control interface that can be effectively used with ATCoach, ATTower and other simulation systems as well as in other settings that rely on spoken commands to initiate actions.

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