



AI-BASED REAL-TIME TRANSLATION OF RAILWAY ANNOUNCEMENTS: ACCESSIBILITY AND CYBERSECURITY

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Abstract – Railway passenger information systems rely heavily on audio announcements to communicate important information about journeys, delays, and safety instructions. However, these announcements may be inaccessible to passengers with hearing impairments and difficult to understand for international travelers due to language barriers. This paper presents the concept of an AI-based system designed to improve the accessibility of railway announcements through real-time speech recognition and multilingual translation. The proposed system processes audio announcements from existing onboard public address systems, converts speech into text using automatic speech recognition, and translates the content into different languages using machine translation. The information is then delivered to passengers through a web-based application accessible on their smartphones. In addition to accessibility, the project considers cybersecurity challenges associated with integrating AI-based services into railway environments. Building on previous research into cyber-secure railway systems, the proposed architecture considers secure data transmission, access control, and protection against unauthorized modification of passenger information. These measures aim to support the integrity and reliability of the information delivered to passengers. Key technical challenges include transcription accuracy, translation quality, processing latency, cybersecurity, and reliable information delivery. The presentation introduces the proposed system architecture, discusses accessibility and security considerations, and outlines future development and testing activities. The project aims to explore how AI-based technologies can improve multilingual communication in railway transport while maintaining appropriate cybersecurity and reliability requirements.

Keywords – Artificial Intelligence, Railway Passenger Information, Speech Recognition, Machine Translation, Accessibility, Cybersecurity.

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