

ATRON at Smart Industry 2022 conference

- [Admin PG](#)
- [17 October 2022](#)



ATRON at Smart Industry 2022 conference, Photo: Jurica Galoić, Pixsell

On 11 October 2022, Smart Industry 2022 was held in Zagreb, where ATRON was one of the sponsors.

At the Hotel Hilton Garden Inn, ATRON presented a wide range of its solutions and products that have been successfully applied in the public passenger transport sector for decades. Presentation of MSc CE Darijan Marčetić, PhD “Data Analysis and Planning in Public Transport Using Artificial Intelligence” within the ATRON Group project has aroused tremendous interest of the profession and the public.

The aim of the project was to develop a system for smart public transport.

The aim of the project was to develop a system for smart public transport that will improve timetable planning, service quality monitoring, critical situation detection and real-time notification. The data were collected by sensors in vehicles.

Project leader MSc CE Darijan Marčetić, PhD, previously worked on several international scientific research projects. His areas of interest are pattern recognition, machine learning, artificial intelligence, real-time systems, expert systems, image and video processing.

Mr. Marčetić, how did the cooperation with the ATRON Group occur, or what attracted you to the issue of public passenger transport?

The ATRON Group is a leader in the European market in the public passenger transport sector. In more than 40 years, more than 40,000 vehicles have been equipped in 300 transport companies. Public transport helps to reduce traffic congestion, reduce air pollution and energy consumption. By analyzing data using artificial intelligence, it is possible to improve the quality of the public transport service. The project of the ATRON Group interested me because of the possibility of working on the development of a system that could improve the quality of public transport, which I personally gladly and often use. Quality and modern public transport would increase user satisfaction, reduce the number of passenger cars in traffic and improve air quality.

To what extent are collected and available data used in terms of optimizing and improving the service in public passenger transport?

The unpredictability of waiting and travelling times has a negative impact on the perception of the reliability and quality of the public transport service. Vehicles in public transport are equipped with sensors and communication technologies. The sensors in the vehicle report in real time the time of arrival and departure from the station, opening and closing the door, location on the route, information about the station, distance from the station, estimated time of arrival at the station, deviation from the planned schedule. Artificial intelligence is used to analyze data. Analyses use years of historical data and expert knowledge of transport professionals. Safe and reliable public transport requires prediction, monitoring and control of the supply and demand of public transport services using artificial intelligence.

Informing passengers about accurate driving schedules, congestion and critical situations in real time can help create a perception of the accuracy and reliability of public transport. The passengers' satisfaction

with the service is assessed by measuring the deviation from the planned and achieved schedule. To what extent can the application of artificial intelligence contribute to the improvement?

Complex public transport systems can have thousands of stations and segments on routes. Scenarios in public transport are abstractly characterized by data samples describing and predicting activities and events characteristic of stations and segments. Traffic lights have a great impact on traffic and the complexity of the scenarios. Thousands of real-time vehicles generate complex data samples that are collected for multi annual periods. Trip times can be very unpredictable. Operators cannot analyze and make accurate long-term predictions and decisions in real time based on millions of new data arriving every second, taking into account historical data for more than ten previous years. Artificial intelligence successfully analyzes historical and current data and generates long-term predictions in a fraction of a second. The quality of artificial intelligence predictions increases as the amount of available data increases.

Are you satisfied with the results you have achieved so far?

The results showed the justification for using artificial intelligence for data analysis and planning in public transport. The analysis of multi annual data provides a precise insight into the structure of supply and demand for public transport services. By analyzing traffic congestion and critical situations, it is possible to improve long-term planning of public transport infrastructure and better match supply with public transport demand. The accuracy of driving schedule prediction is increased by more than 40% for very complex scenarios using artificial intelligence compared to classic methods. Automated assessment of customer satisfaction with the public transport service enables real-time monitoring of the quality of service.

What are the next steps in ATRON Group projects when it comes to applying artificial intelligence?

The ATRON Group is developing several applications based on artificial intelligence. Driving schedule planning and motion velocity analysis are currently under development and being tested on large data sets. In the near future, we are planning to develop a system that will generate dynamically adaptable schedules based on historical data on demand for public transport services that will optimize passenger satisfaction and minimize operating costs for transport companies. The possibility of using it to assess environmental impact and reduce energy consumption will be explored.