

SUMMARY

ON THE DEVELOPMENT OF INTELLIGENT RAILWAY INFORMATION AND SAFETY SYSTEMS

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My doctoral research was focused on the research and development of railway systems, especially railway control and signalling systems. Within this framework, my specific aim was to research and develop an Intelligent Railway System in Hungary. My theoretical research work at the university is combined with practical experience gained at the Hungarian State Railways. In the course of this research, I participate in the development work related to the intelligent railway system currently being developed at the University. My research work aimed to promote the results of the development by applying and integrating them into the railway system, and to introduce new components (for example, founding the safety and security-driven planning method, suggesting a railway intelligent agent model, etc.) In my Doctoral Thesis, I presented these activities and their results in a thesis-like way. My opinion, experience, and research results on the development of the railway system have been published with the aim of opening a debate and starting an exchange of views in this field. There is a demand for railway developments based on scientific grounds. Intelligent transport systems will have to provide a holistic solution across the whole range of transportation. The infrastructure of transportation (including railway interlocking systems) can be considered critical from the point of social well-being; therefore, its protection is of primary importance. Machine intelligence and smart systems are transforming our societies. Intelligent machines must also be used in the railway system, as the complexity of infrastructural networks is growing exponentially. Networking and communication-based operation will have an increasingly important role in the railway system, too. A large amount of data generated by network-based operation and automatically transformed into information will allow the basic forms of automatic operations in the railway system. In conclusion, the use of machine intelligence will result in increased efficiency, sustainability and safety in transportation in the future.