University of Rijeka, Faculty of Maritime studies

PROJECT ACRONYM AND TITLE: Development of computational algorithms based on digital signal processing and artificial intelligence methods with application in modern transport systems (UNIRI-ZIP-2103-4-22)

FUNDING PROGRAMME: Scientific-Research Project Initiatives of the University of Rijeka (ZIP UNIRI)

PERSON RESPONSIBLE: Assist. Prof. Nikola Lopac, PhD

FINANCIAL DATA

Project total cost	Overall funding assigned to PFRI
8.494,26 €	8.494,26 €

SUMMARY

The project is directed toward developing computational algorithms based on advanced digital signal processing techniques and artificial intelligence methods. The research will particularly focus on the computer-aided analysis of non-stationary signals using two-dimensional quadratic time-frequency distributions, where the improvement in time-frequency resolution and robustness to noise will be thoroughly studied. Moreover, adaptive algorithms for non-stationary signal denoising will also be investigated. The considered digital signal processing algorithms will be combined and upgraded by artificial intelligence methods, particularly those relying on deep learning algorithms, such as convolutional neural networks. Finally, the developed algorithms will be validated using synthetic and experimental data acquired from various real-life applications. The project's second phase will include an analysis of the potential applications of novel digital technologies and the developed computational algorithms in the modern transportation sector, including autonomous vehicles, maritime communications and electronic navigation systems, and autonomous navigation.

Start date	End date
01.06.2023.	31.05.2026.

WEBSITE: -

ADDITIONAL INFORMATION:

Members of the project team:

- Assist. Prof. Nikola Lopac, PhD, *University of Rijeka, Faculty of Maritime Studies*
- Prof. Irena Jurdana, PhD, *University of Rijeka, Faculty of Maritime Studies*
- Tomislav Krljan, *University of Rijeka, Faculty of Maritime Studies*
- Assoc. Prof. Jonatan Lerga, PhD, *University of Rijeka, Faculty of Engineering*
- Assoc. Prof. Nicoletta Saulig, PhD, *Juraj Dobrila University of Pula, Faculty of Engineering*
- Prof. Nobukazu Wakabayashi, D. Eng., *Kobe University, Graduate School of Maritime Sciences, Kobe, Japan*