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To:

Ministry of Scientific and Technological Development and Higher Education,   
Republic of Srpska Government

**Letter of Recommendation in support of the proposal “Designing models and algorithms of artificial intelligence for solving hard combinatorial optimization problems”   
of the Faculty of Natural Sciences and Mathematics, University of Banja Luka,   
coordinated by Dr. Marko Đukanović**

To whom this may concern,

I became familiar with Dr. Marko Djukanović, his team, and their research activities from a joint Erasmus+ ICM 2020 academic cooperation project between Carinthia University of Applied Sciences (CUAS), Austria, and the University of Banja Luka (UBL), Bosnia and Herzegovina. This project took place between 2020 and 2023 and resulted in numerous academic mobilities at faculty, student, and administration level. The most recent exchange took place in the summer semester of 2023 including mobility between CUAS and UBL of one student, two administrators and four faculty members.

As professor of Geoinformatics at CUAS and of the Erasmus+ ICM 2020 project team member I was responsible for the pedagogical supervision and curriculum related questions such as teaching content for incoming academic staff and selection of courses to tailor individual student learning agreements.

In May 2023 I visited the UBL together with my colleague Dr. Gerald Gruber, professor of Mathematics. We gave a mini workshop on GIS and network analysis for graduate and undergraduate students and interdisciplinary faculty members of UBL. Dr. Djukanović visited CUAS in June 2023, and gave a seminar talk presenting one meta-heuristic approach (RILS-ROLS algorithm) to solve the problem of Symbolic regression and organized workshops on the topic of Mathematical programming and its applications.

We used our visits to intensely explore possibilities of future cooperation between our institutions. We identified common research interests especially in current developments in Data Science, Mathematics, Optimization and Geoinformatics. Marko had been intensively talked to Prof. Gruber about applying pure meta-heuristic and hybrid approaches to geospatial data in order to identify interesting patterns that may be of great interests in Geoinformatics. We came into a conclusion that optimization techniques are important in achieving high standards in Geoinformatics and therefore working on common ideas in that direction would make benefit for the both sides. CUAS offers a successful MSc study program in Applied Data Science; hence we explored possibilities of a joint degree in this field, where all our research expertise would make a major contribution.

In our encounters Dr. Djukanović and his research group demonstrated a high level of scientific expertise and communicated confidently in an international scientific and academic community. On a personal level I like Dr. Djukanović professional curiosity and open-mindedness. He is capable of communicating successfully across national borders by understanding cultural differences as positive influences in the international academic workplace – and this is recognizable in her team as well.

Keeping this in mind, we are willing to support this project with participation in joint seminars and staff exchanges.

I therefore strongly recommend the project “*Designing models and algorithms of artificial intelligence for solving hard combinatorial optimization problems*” for the grant of the Ministry of Scientific and Technological Development and Higher Education, Republic of Srpska Government.

If you require any further information or would like to discuss anything in more detail, please feel free to contact me at

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Villach, Austria, 30 November 2023

Dr. Adrijana Car