Dipl.Ing. Dr.techn. Adrijana Car
Professor (FH) in Geoinformatics
Engineering IT – Geoinformation and Environment, Carinthia University of Applied Sciences
Europa Str. 4, 9500 Villach, Austria
email: car@cuas.at
phone office: +43 5 90500-2213
https://orcid.org/0000-0001-9737-8664

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 met Dr. Marko Đukanović and his team, and became familiar with their research activities during 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 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. Đukanović 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. Dr. Đukanović had extensively talked to Dr. Gruber about applying pure meta-heuristic and hybrid approaches to geospatial data to identify interesting patterns that may be of great interest in Geoinformatics. We concluded that optimization techniques are important in achieving high standards in geospatial analysis and that working on common ideas in that direction is expected to benefit both parties. 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 can make a major contribution.

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In our encounters Dr. Đukanović and his research group demonstrated a high level of scientific expertise and communicated confidently in an international scientific and academic environment. On a personal level I like Dr. Đukanović professional curiosity and open-mindedness. He can communicate successfully across national borders by understanding cultural differences as positive influences in the international academic workplace, which holds for his team as well.

Keeping this in mind, we are willing to support Dr. Đukanović's 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

car@cuas.at
+435905002213

Villach, Austria, 30 November 2023

Dr. Adrijana Car

Fachhochschule Kärnten – gemeinnützige Privatstiftung, A-9524 Villach, Europastraße 4 T: +43 (0)5/ 90500 – 2002 F: -2110 engineering-it@fh-kaernten.at www.fh-kaernten.at