

FINAL REPORT

Project title: “International Summer School on Deep Learning and Data Science / Mezinárodní letní škola na téma hlubokého učení a zpracování dat“

Project number: 85p6

Project duration: 1. 7. 2019 – 30. 11. 2019

Partners: Faculty of Electrical Engineering and Computer Science of VSB - Technical University of Ostrava (Czech Republic), Faculty of Computer Science of University of Vienna (Austria)

Funding scheme: Aktion programme Czech Republic-Austria

The project “International Summer School on Deep Learning and Data Science” (further referred to as „Summer School“) was prepared, submitted, and implemented jointly by the Faculty of Electrical Engineering and Computer Science of VSB - Technical University of Ostrava (“FE ECS VSB-TUO”) and the Faculty of Computer Science of University of Vienna (“FCS UV”).

The project followed the existing collaboration of the partner institutions. In November 2016, a workshop on Machine Learning, Data Mining, Data Processing, and Image Processing took place at VSB-TUO in Ostrava. In February 2017, another workshop on Visual Data Mining and Applications took place at University of Vienna. In August 2017, the first joint Summer School was held in Ostrava followed by the 2nd edition which took place in September 2018 in Vienna. The Summer School attracted more than 100 applicants and the selection had to be done according to strict criteria. There were 53 participants from 6 countries. As an output, both faculties concluded Erasmus+ Agreement and the joint proposal for the 3rd Summer School was prepared during the exchange stay of a member of the Organizing Team in March 2019 in Ostrava.

The Summer School was held in Chvalovice near Znojmo from August, 26 to August, 30. There were 20 selected participants from 3 Czech universities (VSB-TUO, Tomas Bata University in Zlin, Palacky University Olomouc) and 20 selected participants from the Austrian universities (University of Vienna, Vienna University of Economics and Business, and Vienna University of Technology) who received a scholarship and could attend the Summer School. They were accepted after their registration on the website of the Summer School, which was set up and updated before and during the event (<http://dap.vsb.cz/cass2019/>). The selected students contributed a small fee (1000 CZK for Czech participants, 60 EUR for Austrian participants). In total, there were 50 participants from 11 countries which created a nice multicultural environment and allowed to build new contacts and friendships.

The lectures held by the Czech lecturers were focused on Deep Learning and Deep Neural Network and their Application for Time Series and Social Network Analysis. The introductory lectures concentrated on the basic

description of the deep learning principles. The latter lectures dealt with their applications in set domains and the specific advantages they can provide for the understanding of data. The last set of lectures focused on advanced principles and architectures of recurrent artificial neural networks. There were in total 4 lecturers from FEECS VSB-TUO. Jan Platoš had 2 lectures focused on Topic Analysis and Deep Neural Networks and Time series Prediction by Neural Networks. Václav Snášel, Rector of VSB-TUO, had a lecture on Deep learning for Web Intelligence. Pavel Krömer explained Deep Learning for (Social) Networks and finally, Sebastián Basterrech had 2 lectures on Optimization Techniques for Deep Neural Networks and on Reservoir Computing Paradigm.

The group from Vienna concentrated in the lectures on the fundamental as well as applied aspects of visual data analysis. Although there was a change in the team of presenters due to the departure of Thomas Torsney-Weir from FCS UV, a quality substitute programme was provided by Raphael Sahann and Sebastian Ratzenboeck. The students were in the lectures of Torsten Möller familiarized with the basic principles and technologies of visual tools and their applications. The talks by Christoph Krajl introduced the semantics of various data types and their implications for visual representation and encoding. Finally, the presentation/tutorial by Raphael Sahann guided the students through hands-on experience with Tableau, a powerful state-of-the-art visual analytics tool. The team from FCS UV was also responsible for the programming challenge of CASS 2019. The challenge, presented to the students by Sebastian Ratzenboeck, attracted their attention and provided a great opportunity for joint work and close collaboration with the mentors.

The participants were accommodated at the Hotel Styria in Chvalovice (situated close to Znojmo). The students were accommodated in double-rooms, the lecturers and the organizers stayed the whole time of the Summer School and the expenses of their stay were covered from the grant.

The meals for the participants (breakfast, lunch, dinner) were served in the same building where the lectures were held, so there was no need to move or transport the group. The meal allowance was calculated according to the rules of the programme. The dinner on Wednesday took place in Znojmo and was paid by the grant. The total amount for the meals was lower than expected.

The Czech participants used the University bus which transported the whole group on the way Ostrava-Olomouc-Chvalovice and back. The real travel costs were lower than the planned amount. The rest of the grant was used as indirect costs (the social and networking activities of the Summer School and the organization of the event were financed).

There were 2 leisure time activities added to the programme of the Summer School. The first one was the excursion to Znojmo with a guided tour. After the excursion, tasting of regional cuisine took place in a local restaurant. The costs of the excursion were covered by the grant. The second one was an International football match between the Czech Republic and Austria which was organized at the local sports place. The Austrian team played an excellent match and won 23:3. The second option for the afternoon programme was swimming. The sports activities were followed by a farewell barbecue in the hotel's garden.

The Directors of the Summer School discussed potential research collaboration and suggested a list of topics for future project proposals.

Both partners thank the Aktion Programme Czech Republic-Austria for the support of the Summer School. The program of the Summer School, the list of participants, a selection of pictures, the financial report, and the results of the evaluation survey are attached to this report as separate documents.

In Ostrava, 9. 12. 2019



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Assoc. Prof. Ing. Pavel Krömer, Ph.D.
Director of the Summer School