



Final report AKTION, project 97p4

1. Intent of the joint educational activity of UAS Technikum Wien and Brno University of Technology

The intention of the joint trip as part of the course "Sports practice measurement week - winter" of the study programme Master Sports Technology of the UAS Technikum Wien (UASTW), for the students listed below, was to become acquainted with:

- Planning and execution of a field study in winter.
- Selection of suitable sensor technology.
- Planning and assembly of the measuring chains.
- Testing of the selected methods (sensor technology, measuring chains) in the laboratory.
- Application of the appropriate measuring technique in the field.
- Discussion of the obtained measurement results considering the influences and problems of a field study in winter.

2. Planned outcomes of the project

During the "Sports practice measurement week" every group had a status presentation every day. The status presentation contains information about research question(s), methods, problems and successes during the day, first findings (data treatment) as well as intentions for the next day. In addition to exchanging knowledge during these presentations, the students in one project group were also available to other project groups as test subjects.

Based on these activities, students should be able...

- to estimate and plan the effort of small projects on metrologically supported field studies in winter.
- to understand, solve and process measurement tasks for the collection of representative data sets of metrologically supported field studies in winter.
- to evaluate, interpret, analogously represent and present the measurement signals obtained during field studies supported by measurement technology in winter.

3. Implementation of the event

a. Preparatory part in Brno:

Students prepared an independent project during the semester so that they were able to collect data and partially process it during the joint "Sports practice measurement week". The preparatory activity consisted in the preparation of the material and technical base for the measurements, the development of the measurement methodology at the event site, the preparation of the data processing so that the prepared programs could be used to start the partial evaluation of the results during the Measurement Week.

The preparation was carried out under the guidance of the project guarantor from BUT, FEKT, UBMI doc. J. Kolářová. The project focused on the possibility of using inertial sensors for the evaluation of selected indicators of cross-country skiing technique.





The students used the technology of the Sports Technology study programme and the technical possibilities of the sports facilities of BUT Brno, Sports Activities Centre. The students were preparing regularly during 10 weeks of the semester, both theoretical and practical. Model situations were created and implemented, which students had to solve during the Measurement Week. This part of the project, the preparation for the actual practice abroad and the readiness for the main event of the project Measurement Week, was assessed by the supervisor of this part at the required level, both theoretically and practically.

b. Implementation of the project within the practical field training Measurement Week with UASTW

The event was attended by 5 project groups of students from UASTW and 2 project groups from BUT. The list of participants is given in the appendix of the report.

The practical professional part of the project was carried out during the Measurement Week from 3. – 8.12.2023, which is organised by the UASTW in Obertauern, where suitable conditions for working with winter sports technologies are guaranteed during this period. The actual measurements were carried out every day according to a schedule in order to collect the necessary amount of data for processing and evaluation for the project outputs. During the morning of the first two days the preparation for the measurements was carried out, and in the afternoon the initial measurements were carried out as planned. On the following days, the measurement data was processed during the morning sessions and further measurements were carried out in the afternoon. In this practical part of the project, the students were guided by the supervisor Assoc. prof. Pavel Korvas. He supervised the preparation for individual measurements as well as the field measurements.

The programme of practical activities during the Measurement Week is attached to the report.

In this part of the project the students demonstrated good abilities and skills to carry out the planned challenging activity, were able to solve problem situations under very difficult conditions and were evaluated as very good by the supervisors.

During the first four days, three lectures were given by a supervisor from UASTW - DI (FH) Markus Eckelt, which were focused on practical and field training in their education system, another on data collection in winter environment, which requires specific equipment and methods as well as a specific approach to recording technology. The last lecture focused on data processing.

The results achieved during the course were twofold. Interim results were presented at the daily meeting of the Measurement Week participants, with good discussion and comments on the methodology and measurement protocols. During the Measurement Week, the main output was the presentation of the possibility of using inertial sensors for the assessment of cross-country skiing from a biomechanical perspective, while presenting some partial results. The complete results and their comparison with the results obtained by other methodologies will be completed as a second measurement output within 2 months and submitted to the BUT sponsor.

4. Summary evaluation of the event





The joint educational event took place on 3-8 December 2023 in the winter resort of Obertauern (Salzburg, Austria). There were excellent conditions for all planned activities, which enabled all participants to implement their planned projects. The methodological and didactic matters were provided by the two project guarantors TI M. Eckelt and doc. Pavel Korvas. Furthermore, there was an external teacher from UASTW Dr. Anton Sabó, who is an expert in project teaching.

The course of the students' activities corresponded to the objectives of the AKTION project. The students were practically introduced to field teaching and measurement in difficult winter conditions, in which they demonstrated the necessary skills and ability to cooperate. They also gained new experiences which they evaluated very positively. From the point of view of the supervisors, the practical part of data collection for the project was done very well.

During the event, they presented the results of the measurements every evening while checking and discussing them with the guarantors and the expert audience, which consisted of other students from Austria and the Czech Republic. The event was attended by 17 students from UASTW and 7 students from BUT, list attached.

The students' study stay at the Project Measurement Week with the partner University was very beneficial and above all motivating for the group of students in relation to further self-study and practical outcomes.

5. Stay at the planned event:

All three students completed the entire planned stay from December 3 to December 8, 2023 and met all the requirements needed for recognition of their internship.

Student List:

Bc. Goldschmidt Tobias, residence fee 270 € (6 days, each 45 €)

Bc. Jaroš Oliver, residence fee 270 €

Bc. Ondřej Bekr, residence fee 270 €

6. Transport of students supported by the AKTION project

Transportation of students from the Czech Republic to the event was combined, from Brno to Vienna by train and by public transport to meet the group from Vienna. Furthermore, these students travelled together with the group from Vienna by bus. The partner school asked for a contribution towards expenses for this travel. The request for an accounting is annexed to the report.

The transport Brno - Vienna and back and the transport in Austria are billed for these students:

Bc. Goldschmidt Tobias, train Brno – Vienna and back 569,- Kč, city transport Vienna, 4,80 €, bus Vienna – Obertauern – Vienna, 101,20 €,

Bc. Jaroš Oliver, train Brno – Vienna and back 569,- Kč, public transport Vienna, 4,80 €, bus Vienna – Obertauern – Vienna, 101,20 €,

Bc. Ondřej Bekr, train Brno – Vienna and back 569,- Kč, public transport Vienna, 4,80 €, bus Vienna – Obertauern – Vienna, 101,20 €,

