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Press Release

SportVid: AI-based analysis of sports videos

DFG funding for collaborative project of DSHS and TIB

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Analysing videos plays a very important role in sports science research and competitive sports. Almost all scientists and coaches use videos to evaluate research objects, visualise movement sequences and study opponents in detail. Although there are some major sports science databases in Germany, they either do not contain videos or do not provide any functionality for content-based searches in or AI-based analyses of sports videos.

The Institute of Exercise Training and Sport Informatics and the Central Library for SportScience (ZBSport) at the German Sport University Cologne (DSHS), together with the TIB - Leibniz Information Centre for Science and Technology and University Library want to change this and have acquired funding from the German Research Foundation (DFG). For the sports informatics project "SportVid: A portal to support the search, analysis and evaluation of videos in sports and training science" (DFG project number: 541944920), they will receive over 750,000 euros for a three-year project period. "The SportVid research infrastructure will expand the sports science information system by enabling research in a large sports science video collection as well as comparative analysis and evaluation using AI-based computer vision approaches," explains Prof. Dr. Daniel Memmert, Head of the Institute of Exercise Training and Sport Informatics, which is contributing its expertise from various current AI and ML projects, also funded by the DFG. Machine learning (ML) is a technique that enables computers to recognise patterns in data and learn from them, while artificial intelligence (AI) is a broader concept that aims to design machines to perform tasks that typically require human intelligence.

The expertise of the three project partners complements each other perfectly: ZBSport has expertise in portal development and provides the target platform, while the scientific partners at DSHS Cologne and TIB are recognised in the fields of sports science, sports informatics, multimedia and digital libraries. To implement the project, a corresponding infrastructure (SportVid) is being developed for ZBSport, which includes a web-based research and analysis portal for sports, training and exercise videos for sports science research. The research data generated will be made openly available in a suitable form via a corresponding information system and the programme code generated in the project will be published via Github for subsequent use (cf. floodlight project).

Expertise in dealing with video data and information in the age of the internet and digitalisation comes from the TIB. Here, computer scientist Prof. Dr Ralph Ewerth and his Visual Analytics research group have been working for many

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years on analysing videos and multimedia data that are available in multiple modalities (e.g. speech and image) or have been captured using different sensors. Among other things, the working group researches and develops methods of automatic video analysis and artificial vision in conjunction with machine learning processes. "The goals of our project include the domain-specific annotation of sports videos, the development of low-threshold tools for researchers from the sports sciences to train AI models and interaction options for exploring the video data," explains Prof Ewerth. Ewerth has already collaborated with Prof Memmert in a previous research project, in which new methods for multimodal sports data analysis were researched with the support of the Federal Ministry of Education and Research (BMBF).

The Central Library for Sport Sciences currently uses the cloud-based library system ALMA (ExLibris), which is linked to the PrimoVE search portal. This makes it possible to search both the metadata and the indexed full texts of the referenced media. The integration of SportVid is also associated with a change to a simple and intuitive user interface. Dr Heike Ackermann, Head of ZBSport, explains: "Connecting the platform to our university's central library ensures that the project results are made available in the long term. We guarantee constant support for the website, which will maximise its visi-bility to the outside world."

This ensures that the portal can also be used beyond the project period: on the one hand by implementing the search portal in the ZBSport portal and on the other hand by making the project's programme code available and usable.