Semi-Automated Soccer Game Analysis

Development of a tactical analysis system for non-professional soccer

Graduate

Lukas Dünser

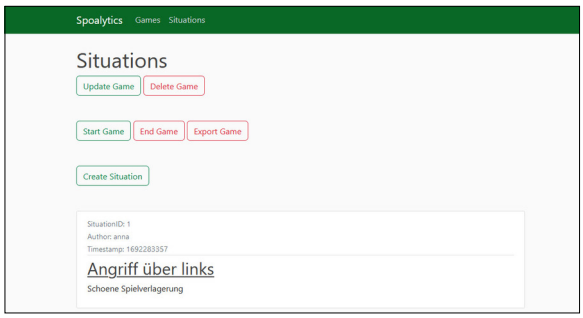
Initial Situation: Tactical analyses, created and provided through technical tools, are widely used in professional soccer. However, they often require significant technical effort and/or come with high costs. To bring the advantages of visual tactical analysis through video study to amateur sports, a simple and cost-effective system has to be developed.

Approach / Technology: For such a project it is essential to use affordable hardware and software. Open-source (freeware) software is particularly considered for this aspect. Furthermore, it is important to make the system user-friendly and practical.

The web application is designed as a client-server architecture and is implemented on the backend with Python and Flask. Conventional web technologies such as HTML, CSS, and JavaScript, combined with Bootstrap, are used for the frontend. The concatenation of the individual video sequences in addition of the annotations are executed by FFmpeg, a video and audio conversion platform. This process is controlled by a script through Windows PowerShell.

Result: An action camera records the soccer game from an elevated position. During this recording, a developed web application is used to create records of game events and tactics. These written records, along with timestamps captured during note creation, are stored in a database. At the end of a game phase the video files are copied to a PC and processed with the created annotations. The result is a video file enriched with timestamps and notes. These individual timestamps can be used to jump to that point of the video file during tactical review with a soccer team. This aims to improve the situation handling of every soccer player in future game situations.

web application
Own presentment



tactical analysis
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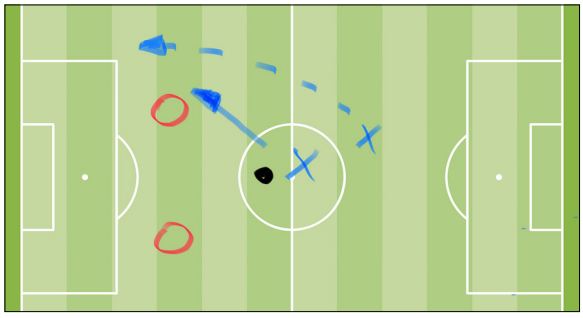
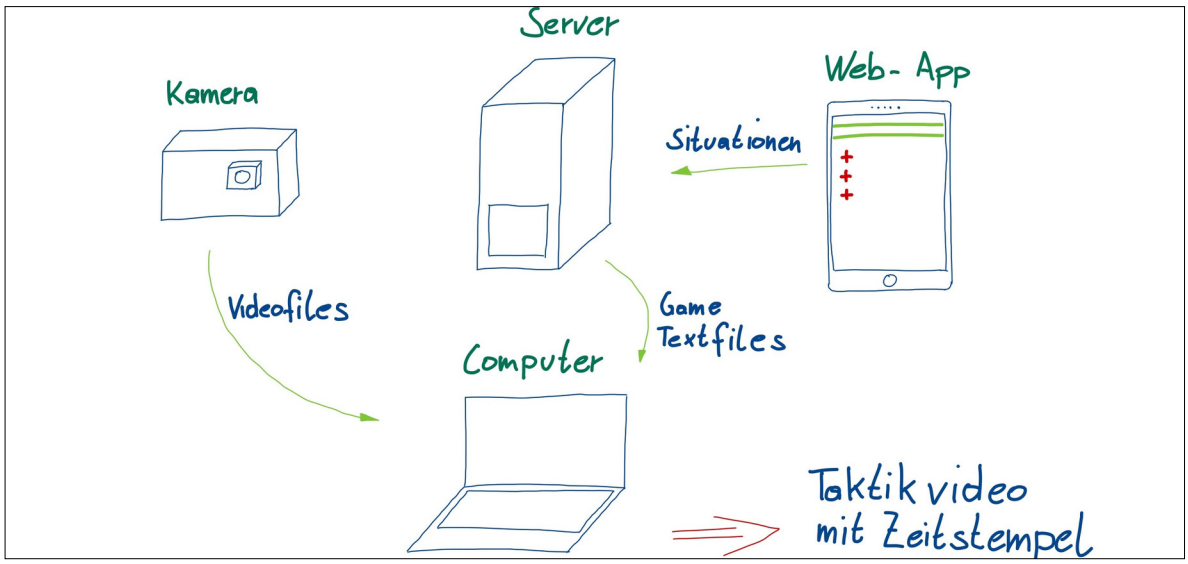


system overview
Own presentment



Advisor
Prof. Laszlo Arato

Co-Examiner
Prof. Dr. Carlo Bach

Subject Area
Computer Science