Universität Basel

Research Project

StreamTeam: from Individual Sensing to Collaborative Action Analysis

Third-party funded project

Project title StreamTeam: from Individual Sensing to Collaborative Action Analysis
Principal Investigator(s) Schuldt, Heiko ;
Co-Investigator(s) Rumo, Martin ;
Project Members Probst, Lukas ; Seidenschwarz, Philipp German ;
Organisation / Research unit
Departement Mathematik und Informatik / Databases and Information Systems (Schuldt)
Department
Departement Mathematik und Informatik / Databases and Information Systems (Schuldt)
Project Website https://dbis.dmi.unibas.ch/research/projects/streamTeam/
Project start 01.05.2017
Probable end 30.09.2021
Status Completed

With the recent proliferation of small, unobtrusive embedded sensors, the number of data streams and the volume of streamed data has increased enormously. This has strongly influenced both our business and our private life and has brought forward a large variety of monitoring applications in different domains. In all these applications, the analysis of data streams in real-time is essential. One of the main challenges in data stream analysis is the detection of complex events out of the raw streaming data. While personal assistants allow to analyze in detail the activities of individuals, the analysis of entire teams, in particular complex events reflecting the interaction and relations between team members on the basis of the data streams captured on the individuals is largely unexplored. At the same time, such team analysis is essential in all applications where groups of individuals have to jointly solve complex tasks. Examples can be found, for instance, in team sports or in rescue operations (fire fighting, disaster management, etc.).

The goal of StreamTeam is to *monitor, analyze, and visualize the actions of teams of individuals in real-time in highly dynamic and mobile environments in a robust and scalable way*. StreamTeam meets the challenges arising from the very rapidly increasing volumes of continuous data streams that will be digitally captured on the individual and goes beyond mere data collection about sensed facts and log-based post-hoc analysis of the actions of individuals. Most importantly, StreamTeam takes a major step towards online inference of *group behavior*.

StreamTeam will provide i.) novel algorithms for the detection of semantic events in streams of data coming from highly mobile sensors, ii.) a scalable platform for the management of data streams and the detection of semantic events in real-time, and iii.) several ways to specify and retrieve complex events and high-level strategies, including innovative graphical query interfaces, both online/real-time and offline/post-hoc, thereby bridging the gap between a generic platform and selected complex events in a concrete application.

The StreamTeam project will focus on team sports, and in particular on football, based on an existing collaboration between the DBIS group at UNIBAS and the BFH Centre for Technologies in Sports and Medicine. As the Swiss Federal Institute of Sport Magglingen (SFISM) is part of the BFH centre (co-applicant Martin Rumo has a double affiliation at both institutions), the latter acts as interface between technology and especially computer science and sports. The BFH centre closely collaborates with the Swiss Football Association (SFV) and in particular with the coaches of the youth national teams of

the SFV. In addition, the BFH centre has also a close collaboration with the International Ice Hockey Federation (IIHF). As this community is currently in the process of preparing the basis for deploying sensors in the equipment of the individual players, ice hockey will be considered as a second use case for the evaluation of the project results as soon as these technical developments further proceed.

Financed by
Foundations and Associations

Add publication

Add documents

Specify cooperation partners