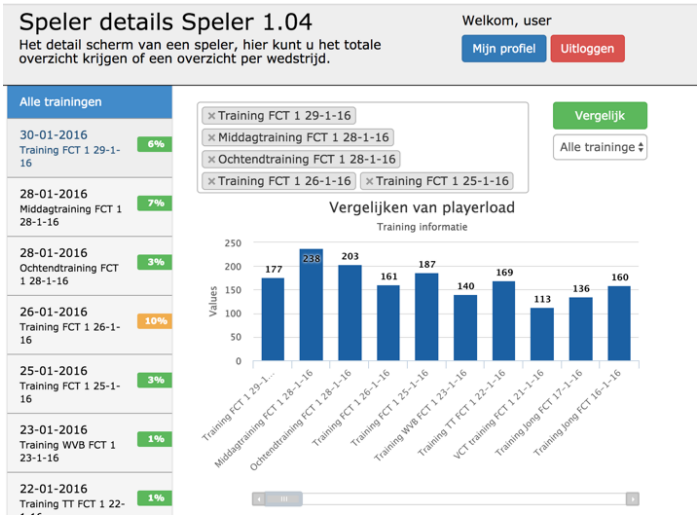
APPLICATION OF MACHINE LEARNING FOR SPORTS INJURY PREVENTION

For most sports, injuries are often the result of overstraining. An important question is how these injuries can be prevented. This project aims to use sensor technology and big data analysis for the early detection of signals of overstraining in order to prevent injuries. To do so, the Saxion research groups Ambient Intelligence and Fitness & Health collaborate with Hanze Univerisity of Applied Sciences Groningen, Roessingh R&D, professional sports clubs (FC Twente, FC Groningen, Heracles, PEC Zwolle Eurosped TVT and others) and partners working on sensor technology (360SI, CE-Mate).



Already, many technologies are used for measuring athletes, as a form of quantified self. Professional clubs invest in expensive systems to track and measure teams to improve their performance and prevent injuries. However, two main problems remain: first, the large amount of data and second, the knowledge that is required to interpret the data and convert these to a training advice. These problems can be solved by using computer models that are generated from systematic data analysis based on the gathered big data, combined with domain knowledge. This calls for a system that stores information from different sources and makes this accessible, so that the data can be combined, aggregated and analysed. The system must build individual player profiles from these data for fast, automatic interpretation. These profiles can be used to estimate the likelihood of overstraining, so that trainers can adapt the training curriculum to prevent injuries.

Some foundations have already been laid with respect to both the front-end part and the machine learning back-end.

TASK DESCRIPTION

- Use machine learning to create a model that can be used to predict the fitness of soccer players in a soccer match, based on measurements during training sessions.
- Determine which variables are essential in making predictions about the player load and fitness and which pre-processing steps must be taken in order to get the right information.
- Create a software library that can be used by researchers and by software for the sports trainers.
- Improve the current dashboard that can directly be used by the soccer trainers in order to gain insight in the players' fitness.

PRACTICAL INFORMATION

- **Student profile:** HBO-ICT SE or Applied Computer Science Internship. Affinity with Python (scikit-learn, pandas) and Vue.js is an advantage.
- **Duration:** February 2020 – July 2020.
- **Compensation:** 230 euro before taxes when carrying out this assignment at Ambient Intelligence.
- **Contact person:** for more information, contact Etto Salomons (**e.l.salomons@saxion.nl**).
- **More information:** **saxion.nl/ami**