



IDP: Master Informatics FC Bayern

Optimizing Athlete Performance: Energy Metabolism Analysis, Training Planning, and Load Management

FC Bayern

FC Bayern München is one of the world's most successful and iconic football clubs, known for its rich history, passionate fanbase, and unparalleled dominance in German football. Established in 1900, the club stands as a symbol of excellence and ambition, with a commitment to winning titles and fostering talent on and off the pitch.

Goal of IDP:

You will develop a tool to visualize the athlete's/patient's energy metabolism. This tool will be used to monitor and manage athletes and via a training plan.

Context:

We have collected performance indicators data such as Spo2 values, lactate and movement data. However, there is a dependence on third party programs to analyze them a use the data to transform it into wisdom for our athletes in the form of concrete workouts.

You will work in an interdisciplinary team with physio and performance therapists to create an intelligent platform for optimizing athlete performance.

Initial literature

- Glycolysis and oxidative phosphorylation as a function of cytosolic phosphorylation state and power output of the muscle cell- Alois Mader
- Lactate Thresholds and the Simulation of Human Energy Metabolism: Contributions by the Cologne Sports Medicine Group in the 1970s and 1980s - Henning Wackerhage, Sebastian Gehlert, Henry Schulz, Sebastian Weber, Susanne Ring-Dimitriou and Oliver Heine



Project Roadmap:

- Kickoff at Bayern Campus with problem description
- Literature review
- Model building
- Application building
- Midterm result presentation (and match day?)
- Model testing with own performance data
- Model adaption
- Release and pitch

Tech Stack:

VS Code, Python, Github, Copilot, Firebase, React

Application

FC Bayern stands for excellence, ambition and commitment. We will only consider outstanding applicants or applicants with experience in performance optimization.

You will get an official certificate that you worked for FC Bayern.

Basit Ahmad

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We are looking forward to hearing from you!