

MASTER'S THESIS:

## **PREDICTION OF INDIVIDUAL RUNNING PERFORMANCE WHEN RUNNING IN SHOES FEATURING DIFFERENT STACK HEIGHT WITH STRYD POWER MEASUREMENTS**

### **Background:**

The running shoe market is the dominant segment in the global athletic footwear market with the highest market share. Therefore it is no surprise the number of brands, models and technologies & innovations in the running segment are immense to fight for the consumer. Trends in running shoes over the years featured cushioning technologies, pronation support, natural running, high energy return and currently high stack height with high bending stiffness.

Recent studies have shown that interventions with shoes differing in geometrical and mechanical characteristics can significantly improve running performance [1]. While the exact reasons for the improvements are still to be explained, it is believed that the thickness of the sole, also known as stack height, has to play a vital role for the running performance and that performance responses are dependent on the individual runner [2, 3, 4].

In order to measure running performance and track certain running parameters in the field compared to a lab environment, sensors that can be placed on the footwear while running have shown to be a reliable methodology. Within the wide range of sensors on the market, the STRYD sensor has been proven to be industry leading and highly correlating with lab relevant parameters when measuring running performance and effort [5, 6]. First internal pilot trials have shown that shoe induced differences in spatio-temporal running parameters can be detected via STRYD sensors.

As part of the master's thesis, a study will be conducted in which athletes run in shoes with different stack heights in real-world environments. The runs will be tracked with STRYD sensors. This study aims to analyse changes in running parameters when running in shoes with differing stack heights and to predict individual responses based on athletes' data.

### **Tasks:**

- Literature research of relevant work resulting in a comprehensive understanding of the problem, current wearable technology and running shoe technologies
- Create study protocol of running with different prototype shoes and performance tracking with the STRYD sensor
- Participant selection and coordination
- Data acquisition based on created study protocol
- Comprehensive data analysis and performance prediction model creation

In case you are interested, please send your CV, your transcript of records and a small written text about your motivation to:

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