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A New Paradigm in Sports Analytics Presented at the ECSS

July 14, 2014 by [Roman Fomin](#)

Posted in: [Omegawave Team](#)



19th annual Congress of the
EUROPEAN COLLEGE OF SPORT SCIENCE

SPORT SCIENCE AROUND THE CANALS

2nd - 5th July 2014, Amsterdam - The Netherlands

Hosted by VU University Amsterdam and VU University Medical Center Amsterdam



Two weeks ago we participated in the 19th Annual Congress of the European College of Sport Science (ECSS), Amsterdam 2014. This Congress was the second largest in the history of the ECSS with over 2700 participants from 75 countries.

After our publication involving injury prediction in professional sports during the American College of Sports Medicine Annual Meeting 2014, we extended our work to the sphere of performance prediction. We introduced this new approach – ‘Prediction of Team Performance in American Football’ – during the session ‘Athletes, Achievements & Development’.

The purpose of our study was to predict overall team performance in order to create an optimal roadmap for success (Fig. 1). We believe that comprehensive analysis of all components of the team’s training process, including daily physiological feedback can significantly improve the process of athlete preparation.

PREDICTION OF TEAM PERFORMANCE IN AMERICAN FOOTBALL

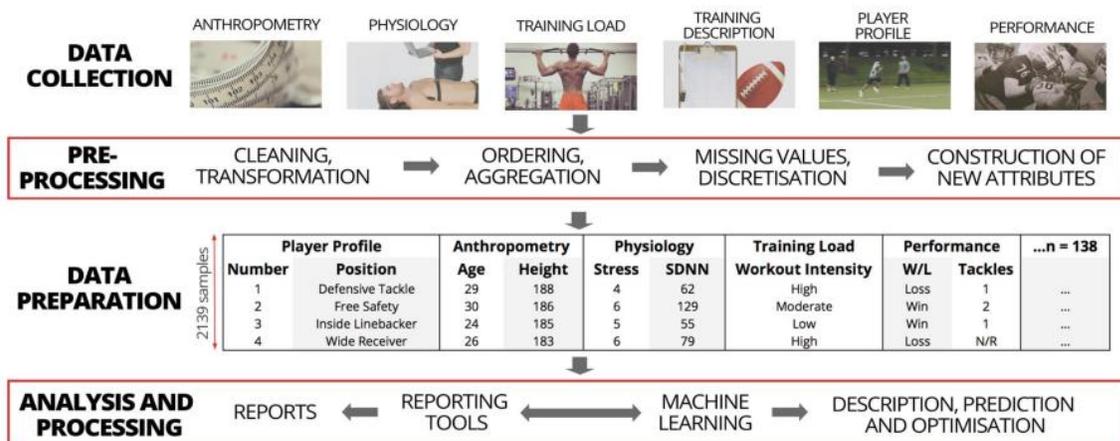


*Fomin R, Kekolahti P, Huttunen P, Fish J, Nasedkin V
Omegawave (FIN), Aalto Uni (FIN), Loughborough Uni (UK), JFC (USA)*

Figure 1. Introduction

To discover new knowledge according to our purpose, we frequently collected parameters that included physiological data, training load, performance and other variables. The dataset was specifically prepared for the development of a predictive model (Fig. 2).

EXPERIMENTAL DESIGN



**THE STUDY EXAMINED 22 PLAYERS OF
AN AMERICAN FOOTBALL TEAM FOR A PERIOD OF 7 MONTHS**

Figure 2. Methods

A new overall team performance metric was developed (Fig. 3). We also designed a scale of high, medium, and low performance levels and established high performance as the desired target. Distance mapping reflects the strength of relationships between each variable and the

target. Physiological parameters, specifically cardiac, metabolic and CNS, demonstrated the strongest contribution to high performance, compared with the other variables. Using biological modelling, we constructed a cost-effective roadmap to achieve high performance.

RESULTS

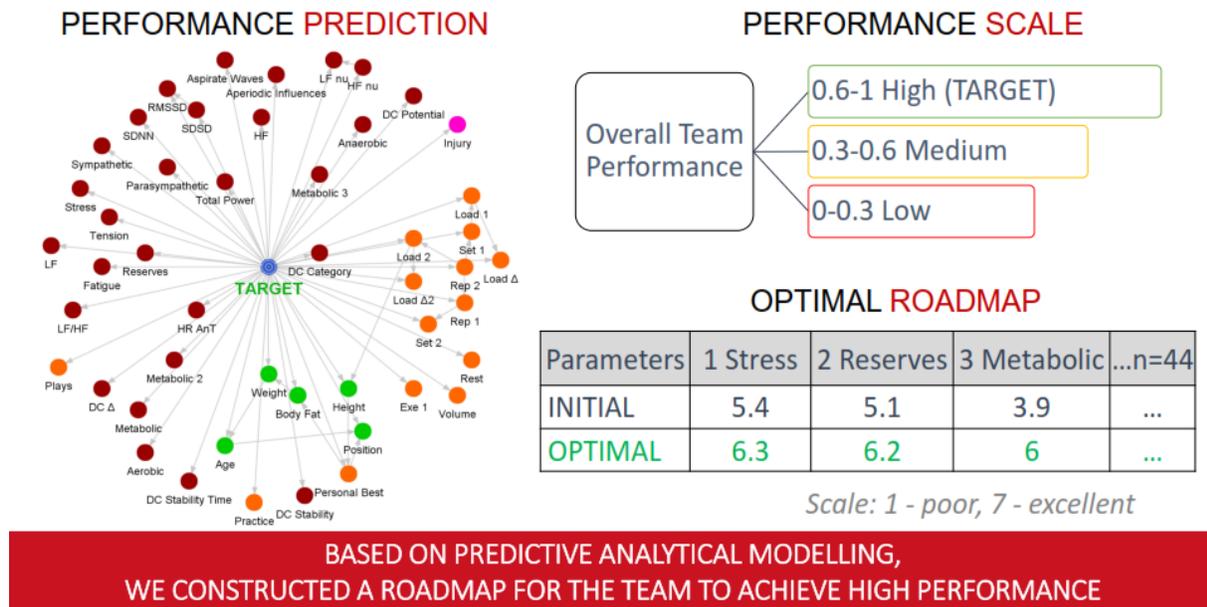


Figure 3. Findings

We realized this new paradigm by combining human and artificial intelligence (Fig. 4). This analytical modelling enabled us to more effectively utilize the most recent innovations from big data and data mining in sports science. This process can be implemented by the constant re-evaluation of the predictive models, based on newly generated external and internal data. Biological optimization can be a solution to develop an optimal roadmap for high performance.

DISCUSSION

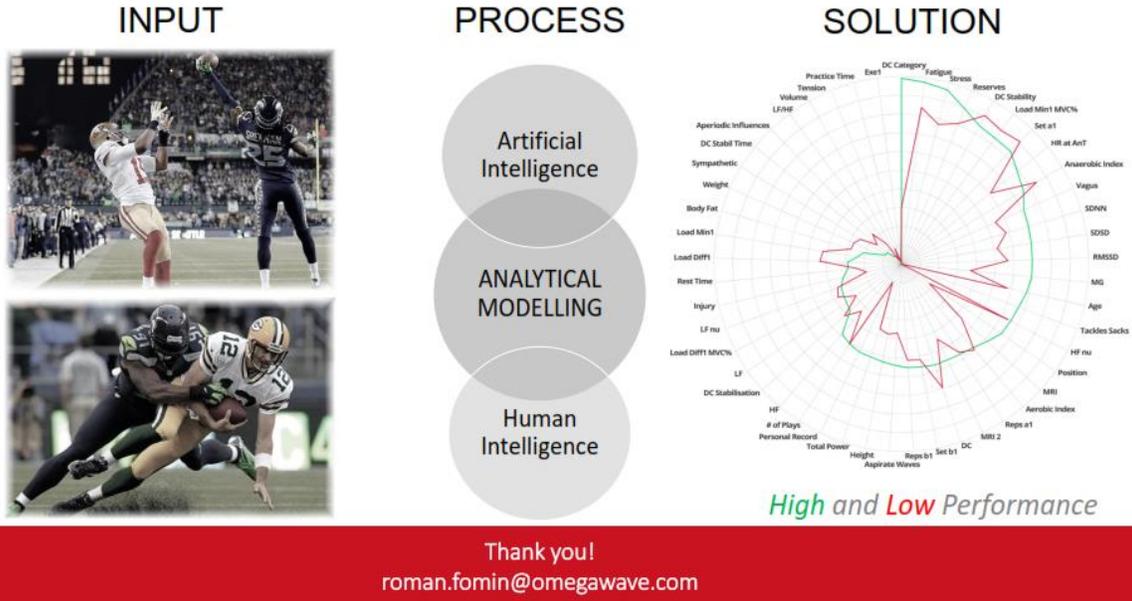


Figure 4. Conclusion

The Book of Abstracts of the ECSS Congress contains the publication of our study, p. 417. [Click here to download the publication.](#)

We will continue to share our publications to enable sport scientists and coaches to develop their knowledge and apply it to practice.

Finally, we would like to thank the ECSS and the city of Amsterdam for hosting the successful event. We look forward to meeting all of our collaborators and partners in Malmö 2015.

You can download our presentation directly from the [ECSS webpage.](#)