SHORT CURRICULUM VITAE –

A KATHARINA DUNST PhD MSc

PRESENT APPOINTMENT:	Head of Cycling Department (2019-) Embedded Scientist (2025-) Scientific Coordinator (2012-)
DEPARTMENT & INSTITUTION:	Institute for Applied Sport Science, Leipzig, Germany German Rowing Federation, Hanover, Germany German Squash Federation, Bocholt, Germany
QUALIFICATIONS:	Ph.D. in Physical Education – University of Marburg, 2020 M.Sc. in Mathematics – University of Marburg, 2015 First State Examination for Teaching (Mathematics, Latin, Physical Education) – University of Marburg, 2011/2012 DOSB Certified Athletic Coach (TAK Cologne), 2018 German Cycling Federation A-License Coach (Frankfurt a. M.), 2019
Testing & Coaching & Consulting	Cycling, Soccer, Squash, Surfing (iQFoil), Track (Sprint) Cycling, Rowing, Running

EXAMPLES OF RECENT EXTERNAL GRANTS:

Total of Research Funding Secured: €1.01 million

Improving Performance Prediction in Track Cycling – Modeling individual physiological adaptations to optimize training loads.

Evaluation of Performance Diagnostic Testing in Track Cycling – Enhancing accuracy and utility of testing protocols.

eCycling – Innovative application of esports for elite cycling performance.

Force-Velocity Characteristics in Track Sprinting – Investigating cyclic and acyclic relationships for performance optimization.

KISKuR (AI-Supported Training Control) – Development, implementation, and evaluation of an AI system for short-duration track cycling.

Anaerobic Power Reserve & Work Balance Models – Validation and application for individualized training in extreme-intensity domains.

tRAIn – AI-based modeling to analyze training effects in cycling and rowing.

Flying 200 m Time Trial Optimization – Analysis and performance improvement in track cycling sprint.

DigiTwin Rowing – Intelligent diagnostic platform using digital athlete twins for German rowing.

RESEARCH TRAINING SUPERVISION:

6 degrees (4 MD, 2 BD) supervised

PEER REVIEWED PUBLICATIONS:

Selected recent and relevant peer-reviewed publications:

Dunst AK, Grüneberger R. A Novel Approach of Modelling and Predicting Track Cycling Sprint Performance. Applied Sciences. 2021; 11(24): 12098.

Dunst AK, Grüneberger R, Holmberg H-C. Modeling Optimal Cadence as a Function of Time during Maximal Sprint Exercises Can Improve Performance by Elite Track Cyclists. Applied Sciences. 2021; 11(24): 12105.

Dunst AK, Hesse C, Ueberschär O, Holmberg H-C. Fatigue-Free Force-Velocity and Power-Velocity Profiles for Elite Track Sprint Cyclists: The Influence of Duration, Gear Ratio and Pedalling Rates. Sports. 2022; 10(9): 130.

Dunst AK, Hesse C, Feldmann A, Holmberg H-C. A Novel Approach to Determining the Alactic Time Span in Connection with Assessment of the Maximal Rate of Lactate Accumulation in Elite Track Cyclists. Int J Sports Physiol Perform. 2023; 18(2): 157–163.

Dunst AK, Hesse C, Ueberschär O, Holmberg H-C. A Novel Approach to the Determination of Time- and Fatigue-Dependent Efficiency during Maximal Cycling Sprints. Sports. 2023; 11(2): 29.

Dunst AK, Manunzio C, Feldmann A, Hesse C. Applications of Near-Infrared Spectroscopy in “Anaerobic” Diagnostics – SmO_2 Kinetics Reflect PCr Dephosphorylation and Correlate with Maximal Lactate Accumulation and Pedalling Rate. Biology of Sport. 2023; 40(4): 1019–1031.

Ferguson H, Harnish C, Klich S, Michalik K, Dunst AK, Zhou T, et al. Power-Duration Relationship Comparison in Competition Sprint Cyclists from 1 s to 20 min: Sprint Performance Is More Than Just Peak Power. PLoS ONE. 2023; 18(5): e0280658.

Ferguson H, Harnish C, Klich S, Michalik K, Dunst AK, Zhou T, Chase JG. Track Cycling Sprint Sex Differences Using Power Data. PeerJ. 2023; 11:e15671.

Dunst AK, Hesse C, Ueberschär O. The Concept of Optimal Dynamic Pedalling Rate and Its Application to Power Output and Fatigue in Track Cycling Sprinters – A Case Study. Sports. 2023; 11(1): 19.

Dunst AK, Hesse C, Ueberschär O. Understanding Optimal Cadence Dynamics: A Systematic Analysis of the Power-Velocity Relationship in Track Cyclists with Increasing Exercise Intensity. Front Physiol. 2024; 15: 1343601.

Dunst AK, Hesse C, Ueberschär O. Understanding Optimal Cadence Dynamics: Practical Applications and Further Directions. J Sci Cycling. 2024; 13(2).

Haase R, Dunst AK, Nitzsche N. The Influence of Pedaling Frequency on Blood Lactate Accumulation in Cycling Sprints. Int J Sports Med. 2024; 45(8): 608–615.

Dunst AK, Hesse C, Ueberschär O. Enhancing Endurance Performance Predictions: The Role of Movement Velocity in Metabolic Simulations Demonstrated by Cycling Cadence. Eur J Appl Physiol. 2025; 125: 895–907.

Haase R, Dunst AK, Nitzsche N. Blood Lactate Accumulation during Maximal Cycling Sprints and Its Relationship to Sprint Performance Characteristics. Eur J Appl Physiol. 2025.

Dunst AK, Ji S, Wahl P. Strength Exercise F-v and P-v Profiles as Predictors of Elite Sprint Cycling Performance. Int J Sports Physiol Perform. (accepted 2025).