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Too hot to race? Towards Heat Stress Adaptation Tools for Endurance Events

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Extreme heat events pose significant health risks to individuals engaging in prolonged outdoor activities, particularly endurance events such as the Dodentocht, a 100 km walking challenge through a suburban area in Belgium. In 2022, the event was shortened during a heat wave based on a predefined air temperature threshold. However, air temperature alone does not fully capture the complexity of human heat stress, as other environmental factors, such as humidity, solar radiation, and wind speed, significantly influence thermal comfort and risk.

To improve understanding of actual heat stress exposure, we conducted a measurement campaign during the 2024 Dodentocht. Several participants were equipped with meteorological backpacks that recorded air temperature, relative humidity, and black globe temperature along the route. These measurements enabled the calculation of meteorological outdoor thermal comfort using the Wet Bulb Globe Temperature (WBGT), which is a widely applied heat stress indicator.

The measurement campaign allows us to validate outdoor thermal comfort predictions generated by a sub-kilometric weather forecast. A heat stress forecast along specific routes would namely offer a valuable tool for event organizers, urban planners, and public health officials to inform the public, optimize route planning and implement heat mitigation strategies. The experimental setup, preliminary validation results, and potential applications of these mobile observations will be presented.