Context and Objectives
The Dutch sit-skiers are among the world's elite, reaching speeds of up to 120 km/h during downhill and super-G races. The greatest opposing force they encounter is air resistance. To enhance their chances of winning Paralympic gold, we aim to reduce this air resistance. The current sit-ski shells are not optimally streamlined, particularly the rear section, which causes significant drag.

Design Challenge
The objective is to design a new, detachable shell component for the back of the seat that significantly improves the aerodynamics of the current sit-skis, without compromising stability. The goal is to achieve a 10% reduction in air resistance, translating to over a second saved on a one-minute descent.

The design must be personalised, lightweight, durable, and user-friendly, allowing easy attachment and detachment for transport and use in competition. The research includes establishing design requirements, developing and modeling multiple concepts, building prototypes, and conducting wind tunnel tests with athletes to measure performance improvements. The design will be iteratively refined based on feedback and testing results.

Team
The assignment is in collaboration with Wouter Terra from the Innovation & Impact Centre, serving as the Graduation Client. Two athletes and two coaches from the Para Ski Team (NSkiV) provide continuous sports-specific feedback. A collaboration with ActiFlow is set up to allow for computer simulations of drag resistance, early on in the project, to steer the design process. A paralympic sports engineer is involved to assist in the prototyping. This collaboration promises to be an exciting project, pushing the boundaries of sports engineering and enhancing the performance of top-tier sit-ski athletes.

For more information and application, please contact

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