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Sustainable Velomobile Development: A Biomaterial-Based, Holistic Design Approach Across the Product Lifecycle - Prof.a C. Gastaldi, Politecnico di Torino

Monday 16 June 2025 16:45 (1h 45m)

This talk presents a circular design approach to developing a sustainable velomobile, a human-powered vehicle suited for short-distance travel, tourism, and green deliveries. Given the rising demand for alternative mobility solutions, velomobiles offer an efficient and weather-resistant alternative to bicycles. The project integrates Circular Design (CD) and Systems Engineering (SE) to optimize the velomobile's entire lifecycle —from material selection to end-of-life strategies. A key focus is the use of bio-based composites, particularly PLA reinforced with natural fibers, which have been purposely characterized to ensure mechanical performance and environmental sustainability. By integrating life cycle assessments (LCA) with lab testing, this study enables informed material selection that balances durability while minimizing the CO2 footprint. The talk will address the definition of the design requirements, the LCA based characterization of the newly developed materials, and the material selection process.