EXCELLERAT CoE: The European Centre of Excellence for Engineering Applications

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The EXCELLERAT Centre of Excellence (CoE) serves as the primary entry point for engineering stakeholders to access experts, services, and knowledge in High-Performance Computing (HPC). Given the high demands of the engineering sector for HPC resources, EXCELLERAT partners are dedicated to providing expertise in data management, analytics, visualisation, simulation-driven design, and co-design for Exascale computing. These efforts aim to address complex and costly engineering challenges while fostering innovative technological solutions, especially during the development phase.

EXCELLERAT CoE is committed to driving innovation in HPC for engineering applications, tackling the challenges posed by large-scale simulations across sectors such as aerospace, automotive, energy, and manufacturing. Through the EXCELLERAT Service Portal, the CoE offers products and services to optimise simulation workflows, integrate advanced data analytics and visualisation tools, co-design for HPC and leverage cutting-edge technologies such as Artificial Intelligence (AI) and Machine Learning (ML) for engineering use cases.

The EXCELLERAT Service Portal acts as a central hub for delivering HPC tools, services, and expertise, fostering user engagement and generating revenue. The long-term goal is to facilitate long-term industry collaborations, securing partnerships and funding, while positioning itself as a self-sustaining product for commercialising research outputs. By offering a platform, the portal offers services and products, ensuring added value support for the HPC and engineering community.

This contribution will highlight key services of the EXCELLERAT Service Portal, including:

HPC-Driven Engineering Applications: Access to specialised software and use cases that improve simulation scalability, accuracy, and efficiency for specific industrial applications.

Workflow Optimisation: Tools designed for efficient pre-processing, simulation, and post-processing in extreme-scale HPC environments.

Technology Integration: Incorporating AI/ML to enhance predictive capabilities, reduce computational costs, and provide access to state-of-the-art HPC infrastructure.

Collaborative Ecosystem: Enabling technology transfer by connecting European researchers, industries, and HPC providers through a unified platform.

Knowledge and Training: Offering tailored training programmes, consulting services, and specialised resources to build expertise and support industry adoption of HPC solutions.

By showcasing EXCELLERAT services and capabilities, EXCELLERAT demonstrates its pivotal role in advancing HPC-driven innovation in engineering, fostering collaboration across Europe, and ensuring a sustainable and innovative future for research and industry stakeholders alike.

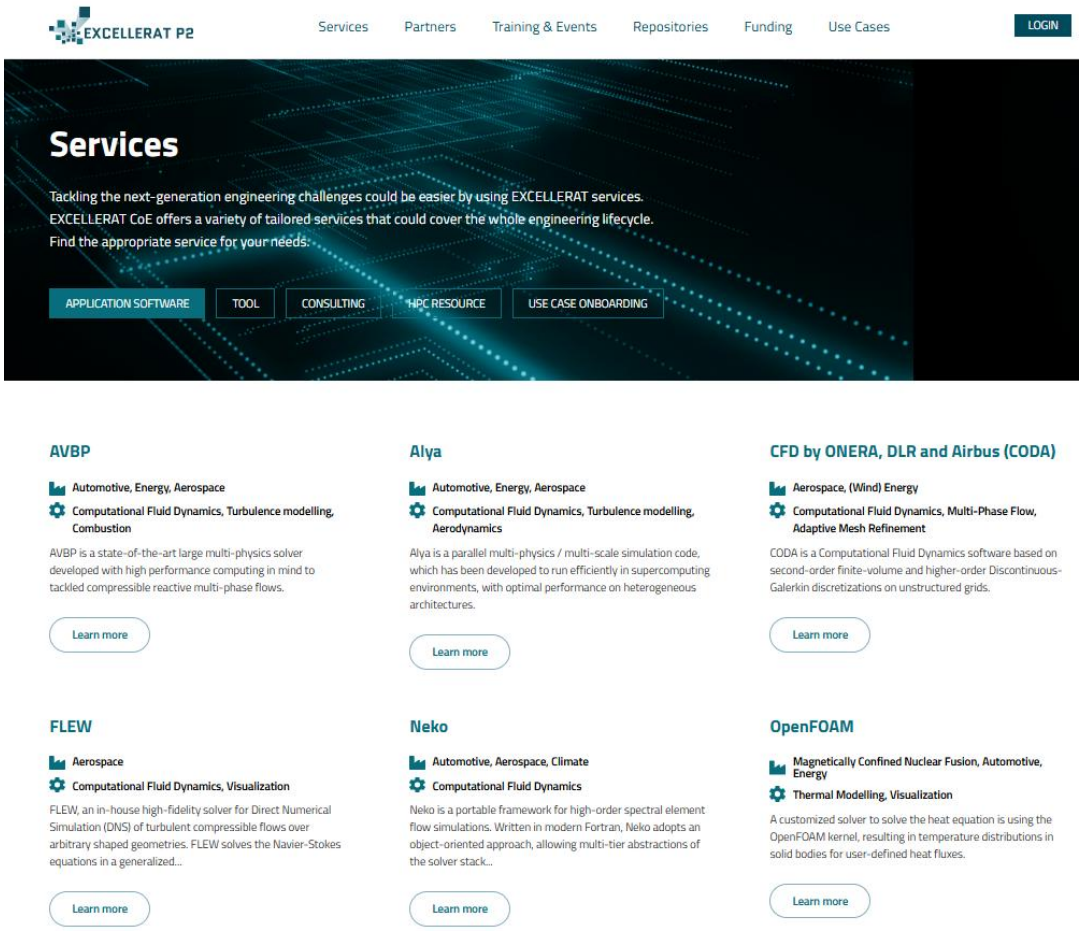

Fig.1: EXCELLERAT Service Portal - Services page.

REFERENCES

EXCELLERAT P2. https://www.excellerat.eu/. (2025)

EXCELLERAT P2. https://services.excellerat.eu/. (2025)