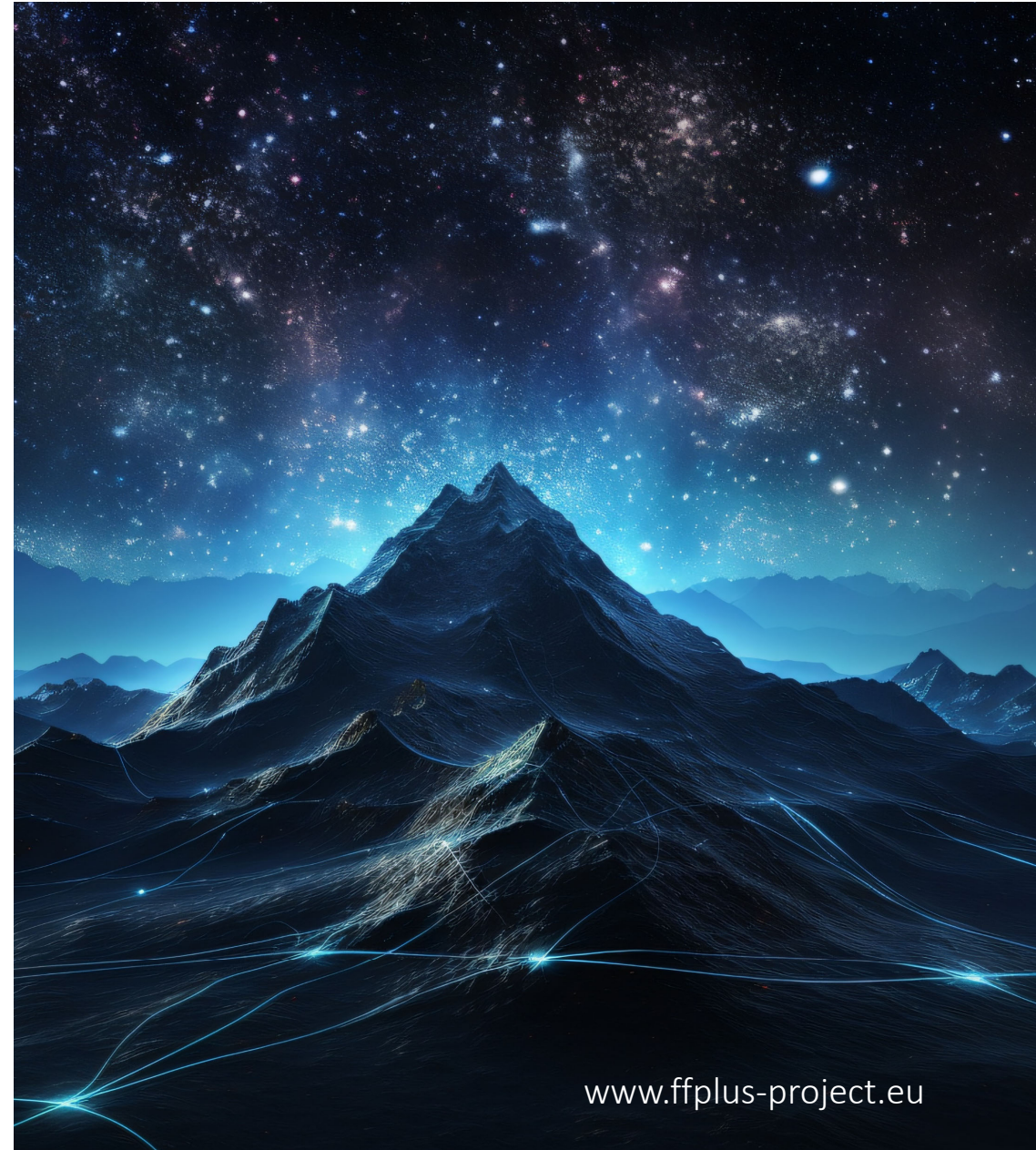# First call for innovation studies for the development of generative AI models

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1 July 2024

www.ffplus-project.eu

Overview

- Intro to the Fortissimo Approach & the FFplus project
  - HPC for Business Innovation, Fortissimo Success Stories

- FFplus Call-1 Type-2: First call for innovation studies for the development of generative AI models
  - Objectives; expectations; funding & eligibility

- Summary of info sources and submission procedure

Fortissimo & Fortissimo-2

Fortissimo – 2013-2016

- Business relevant investigations and demonstrations of simulation services in the Fortissimo HPC Cloud creating <u>future business benefits for manufacturing SMEs</u>

Fortissimo 2 – 2015-2018

- Demonstrating the business potential of an ecosystem for HPC-Cloud services, specifically for applications involving <u>simulation of coupled physical processes or high-performance data analytics.</u>

I4MS
ICT INNOVATION
FOR MANUFACTURING SMEs

Part of the Factories of the Future (FoF) Initiative

Political context

- All major economies world-wide are investing in large supercomputers on the road to Exascale
- EuroHPC is a major commitment by the European Union
- Business Case is for **Science and Industry**
- European citizens expect their taxes to be spent wisely for the good of everyone
- We must ensure our Universities **and** our Companies can access and benefit from investment in supercomputing

The Fortissimo Approach

- Execution of „experiments" with SMEs, delivering real business impact through use of HPC

- The bulk of project funding is used for these experiments and the highest quality, innovative SME-oriented experiments are acquired through the execution of **open calls for proposals**

FF & FF-2 executed 92 experiments generating 79 impressive, business-oriented success stories

https://www.fortissimo-project.eu/

Examples of business benefits

Ergolines Success Story

- SME based in Italy
- Speciality steels technology
- Simulation of slag carry-over from ladle to tundish
  - New monitoring system developed
  - Better overall steel quality
  - Reduced re-melting
- Reduced steel loss by 6,000 tonnes per year
- Savings between 420,000 € - 600,000 € per year

Ergolines received the IDC HPC Innovation Award 2016 for their demonstration of economical benefit of using HPC during their Fortissimo experiment.

Experiment Partners:
Ergolines
Arctur

- SME Industrial End-user
- HPC Centre / Expert

Sports-car aerodynamics - Koenigsegg

- The SME Koenigsegg designs & manufactures high-performance sports-cars
- Aerodynamics development for the Koenigsegg One:1 - HPC-based CFD:
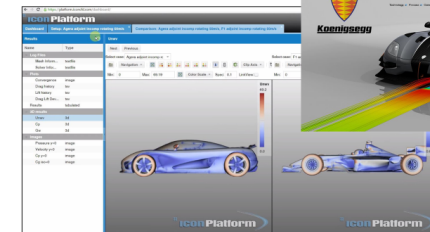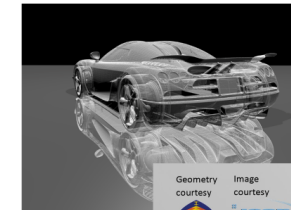- 250km/h → 250% higher down-force
- 440 km/h → 50% higher down-force

Benefits of Cloud-based HPC
- Reduce design costs by 30%
- Reduce wind tunnel testing by 50%
- Reduce prototyping costs by 60%
- Reduce time-to-market by 30%

Experiment Partners:
Koenigsegg
ICON
NTUA
CINECA

- SME Industrial End-user
- ISV
- HPC Expert
- HPC Centre

Geometry courtesy Image courtesy

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FF4EuroHPC Experiments

Call-1

Call-2
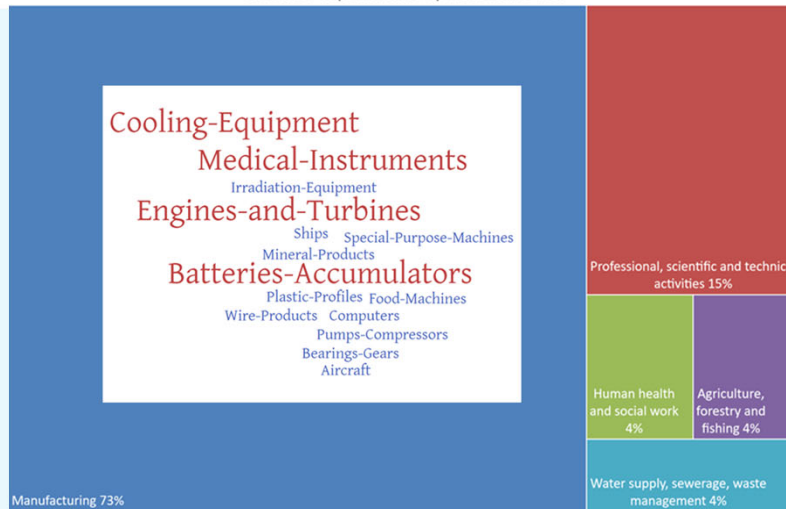
Success Stories

Molecular Dynamics Simulations for New Battery Materials Development
Read more ▸

AI and HPC for Reservoir Monitoring
Read more ▸

HPC-based Hand Gesture Dataset Generation for Detection & Tracking
Read more ▸

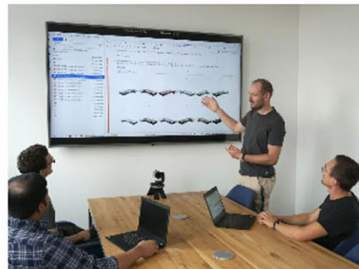Improvement of Productivity in Aquaculture
Read more ▸

Market Innovation Sourcing
Read more ▸

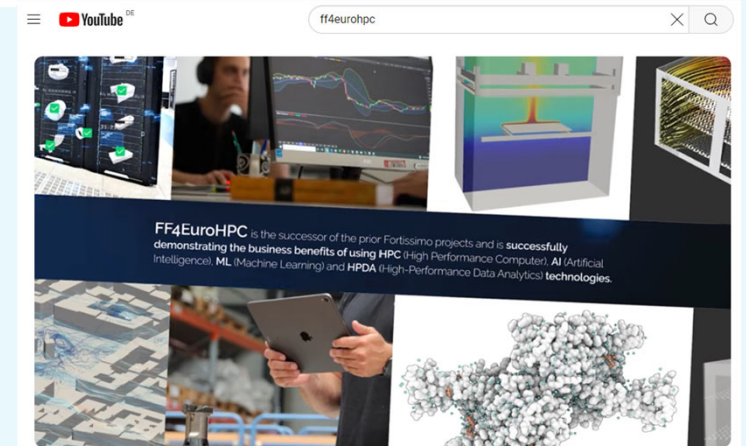HPC Vessel Maintenance Optimization by Natural Language Assistance
Read more ▸

Success Stories

https://www.youtube.com/@ffplusproject

FFplus Objectives

- Empower SMEs with advanced computational capabilities based on HPC, enabling them to drive innovation, enhance competitiveness, and overcome challenges in the digitalisation of R&D and business processes.

- FFplus will execute 6 open calls (3 for business experiments, 3 for innovation studies) with a funding budget over 24 M€

- Business experiments will address the uptake of HPC by SMEs new to using HPC to solve specific business challenges

- Innovation studies will support European SMEs and Start-ups already active in the field of generative AI technology, which lack the necessary computational resources to scale up.

FFplus Consortium & Project Data

- Fortissimo Plus

- Funded by the EuroHPC JU action DIGITAL-EUROHPC-JU-2023-SME-01 "Supporting the competitiveness and innovation potential of SMEs".

- Commenced 1.5.2024; 48 months duration

- Coordinator

- Other Partners:

FFplus 1st open call

SUBMIT YOUR PROPOSAL TO AN OPEN CALL

During the project's lifetime, SMEs and Start-ups will be supported through six open calls to fund business experiments (Type 1) and innovation studies (Type 2).

Business experiments will address the uptake of HPC by SMEs in order to solve specific business challenges of SMEs that have had no prior use of, or experience with, HPC services.

Innovation studies, in contrast, will support European SMEs and Start-ups already active in the field of generative AI technology, which lack the necessary computational resources to scale up.

Successful applicants will receive funding and support from FFplus to conduct these sub-projects. Find more information below and apply to an open call.

ABOUT BUSINESS EXPERIMENT   **ABOUT INNOVATION STUDIES**

https://www.ffplus-project.eu/

FFplus_Call-1-Type-2

First call for innovation studies for the
development of generative AI models

- Deadline: September 4th, 2024 at 17:00 Brussels local time

- Expected duration of innovation studies: 10 months, with targeted commencement December 1st, 2024

- The indicative total funding budget for all innovation studies funded under this call is € 4M.

FFplus_Call-1-Type-2 - Objectives

- Address the needs of SMEs and Start-ups proficient in generative AI and HPC for large-to extreme-scale computing resources → strengthen European SMEs in the area of generative AI.

- "Innovation Studies" driven by the business needs of SMEs and Start-ups highly competent in generative AI, professional software development, and data processing.

- The innovation studies must use large-scale European HPC resources (e.g., pre-exascale and exascale supercomputers) to develop and customise generative AI models such as foundation and large language models.

Potential Future Innovation Study Extensions

- It is expressly foreseen that the targeted SMEs may participate in more than one tranche of innovation studies: if developments and results of their initial innovation study are evaluated successfully, then they would be eligible to submit a proposal for an extension of the developments in a subsequent open call.

- It is a necessary condition for funding that the innovation study complies with the FFplus requirement for reporting of the results achieved up to the end of the 7th month of the innovation study to enable an evaluation of the impact potential, performed by external experts.

- Only the top 70% (based on the ranking arising from the expert evaluation) of successful innovation studies may be given approval for an extension submission, when deemed appropriate.

FFplus_Call-1-Type-2 – Expectations 1/4

- Be fully aligned with the FFplus call objectives
- Explain & justify the business challenge/prospect and why
  - Generative AI provides the solution
  - New model development is imperative
  - The development is timely
  - Identified obstacles can be overcome
- Present the expected business impact of using large-scale HPC & path to success(*)
  - (*) potential value propositions and the process of value creation

FFplus_Call-1-Type-2 – Expectations 2/4

- Define specific objectives to successfully address the business challenge and proposal work plan in terms of a machine-learning lifecycle

- Provide a detailed description and demonstrate the availability of a suitable training data set.

- Detail the characteristics of the models to be developed and outline their repercussions to training and exploitation.

- Explain performance metrics, describe benchmarks to establish baselines and specify methods to ensure experiment reproducibility.

- Identify potential risks considering EU guidelines for trustworthy AI and present means to address and mitigate them.

FFplus_Call-1-Type-2 – Expectations 3/4

Define the resources & the associated costs

- Demonstrate how the allocated resources (personnel, IT/computing, ..) address and fill current gaps in the processes needed to implement the proposed action.

- HPC resources:

  - Explain the HPC resource needs for execution of the innovation study, possibly involving EuroHPC computing systems, e.g. through their AI and Data-Intensive Applications Access system, or through national actions.

  - The NCCS may be able to aid with the selection of appropriate resources and the application process.

FFplus_Call-1-Type-2 – Expectations 4/4

- Data Management Plan:
  - cover policies for data access, usage, sharing, retention, and disposal;
  - outline methods for protecting sensitive or personal data;
  - incorporate FAIR principles and their implementation (when applicable).
- Support the FFplus project in the generation of publishable success stories – including in multi-media form – which discuss how the SME's real-world problems were addressed and clearly identify the business benefits realised or obtained.
- <u>Provision of the pre-final results and potential impact report</u>

FFplus_Call-1-Type-2 – Eligibility Criteria -1/2

- Only organisations with head offices based in an EU Member State or in associated countries that are eligible to receive funding from the Digital Europe Programme are eligible to receive funding. (Natural persons are ineligible)

- Main Participant = SME or Start-up whose business challenge (relating to the development of generative AI) is addressed.

- Supporting participants = organisations supporting the main participant to complete activities foreseen for the innovation study.

- SME participation in the FFplus HPC business experiments and in the covered innovation studies for generative AI development by this open call are mutually exclusive. That is, for the SMEs whose business challenge defines the business experiment or innovation study, funding may only be provided for one type of action.

FFplus_Call-1-Type-2 – Eligibility Criteria -2/2

- Applications are to be submitted <u>by the main participant </u>providing a business case/challenge and <u>optionally (if well justified) up to two supporting participants</u>. All participants must have a clearly-defined role.

- Maximum number of consortium partners (main participant and supporting participants) = 3

- <u>For supporting participants, only engineering activities are eligible for funding.</u> Activities such as business consultancy, marketing initiatives, administrative tasks, and other non-engineering activities are not eligible for funding.

- FFplus beneficiaries are ineligible to participate as either main or supporting participants.

FFplus_Call-1-Type-2 – Funding Conditions – 1/2

- Third Parties will receive 100% funding of incurred, eligible direct costs necessary for the completion of experiment activities; <u>no indirect costs or overheads will be funded.</u>

- The maximum duration of the experiments is 10 months, with a maximum funding budget of 200 K€ <u>for the SME (main participant).</u> The maximum funding for an innovation study is 300 K€.

- Funding limits for supporting participants: <u>a maximum of 150 K€ under this open call (i.e. FFplus_Call-1-Type-2); a maximum of 300 K€ over all FFplus innovation studies.</u>

- The major part of the funding requested should be allocated to the main participant. <u>Any deviations from this principle must be duly justified.</u>

FFplus_Call-1-Type-2 – Funding Conditions – 2/2

Budget module	Additional details
Personnel	Personnel costs need to be commensurate with the work to be performed
Equipment	Depreciation costs only. Only specialized equipment necessary for conducting the innovation study is permitted. Costs for common-use equipment such as laptops, monitors, etc., are not eligible.
Travel	Travel must be justified in terms of the necessity for performance of the proposed innovation study work plan.
HPC compute capacity	Compute Resources need to be justified. Ideally, EuroHPC systems will be used for the work. A decision not to apply for access to the EuroHPC systems should be duly justified.
Material	1. Costs for acquiring specialised SW licenses for conducting the innovation study (licenses for general office software, for example, are not eligible). 2. Costs for acquiring or using data sets or collections needed to conduct the innovation study.

FFplus_Call-1-Type-2 – Evaluation Criteria – 1/2

1. Impact: covering the proposed innovation study's prospects for innovation, commercial viability and potentially also societal relevance, vision of success and value creation/proposition taking the SME's business models and exploitation plans into account, alignment with the objectives of the call.

2. Excellence: covering both conceptual and technical excellence.
   a. Conceptual excellence includes conceptual soundness, cohesiveness, and articulation of plans for bridging gaps to ensure successful innovation study implementation and impact.
   b. Technical excellence includes clear definition of technical requirements, justifying technology choices; articulation of performance metrics for model evaluation, scaling, and optimization; activities for establishing baseline performance and ensuring experiment reproducibility.

3. Implementation: covering the quality of the project's workplan and data management plan, the distribution of resources to additional organisations (where applicable), capacity of the applicant(s) to carry out the proposed work, the justification for computation resources required.

FFplus_Call-1-Type-2 – Evaluation Criteria – 2/2

Each criterion will be assigned a score between 0 and 5.

The overall acceptance threshold (summed over all criteria) is set to 10, while a minimum score of 3 must be achieved for each criterion.

All criteria are equally weighted. However, in case of a tie in the overall score ranking, proposals are ranked based on the individual criteria scoring applying the following priority: Impact, Excellence, Implementation, and finally total requested funding.

FFplus_Call-1-Type-2 – Proposal Submission

- Submission deadline: September 4th, 2024, 17:00 Brussels local time

- Submissions in English

- Electronic submission using the tool accessible via the FFplus website: https://www.ffplus-project.eu/open-call/en/innovation-studies/

- Upload of 2 PDF files (Part A – admin., Part B - content) – each max. 5MB
  - Details in the call announcement (website & document)
  - Only requested information should be included in Part A. Addition of extraneous information... will result in the proposal being rejected without further evaluation.
  - Proposals submitted with a Part B whose length (excluding the cover page & excluding the provision of scientific literature references) exceeds the 12-page limit will be rejected without further evaluation.

FFplus Call-1: 2 Sub-Calls with Separate Documentation & Proposal Submission

- Each Sub-call has a distinct area of the FFplus Website:
  https://www.ffplus-project.eu/open-call/en/business-experiments/
  https://www.ffplus-project.eu/open-call/en/innovation-studies/

- Both of these provide:
  - Call Announcement & Proposer's Guide
  - Proposal Templates as Word documents (Part A & Part B exemplars)
  - Frequently Asked Questions (FAQ)
  - Proposer-Evaluator check-list
  - **Access to the proposal submission tool**

Still have questions about the call for innovation studies?
ffplus-call-t2@scapos-tools.de

→ Q&A Session

www.ffplus-project.eu