

### **Theme: New Memory**

#### **- Sub theme: New Storage for Large Machine Learning Training**

We are looking for new approaches to revolutionize next-generation computing in terms of high performance and energy efficiency. These may include disruptive device technologies that can go beyond state-of-the-art semiconductor electronics and innovative storage architectures that can overcome the limitations of current von Neumann architecture.

As AI and ML become increasingly important in the IT industry, it seems there is a growing need for storage systems that can handle the unique performance demands of AI/ML workloads at scale. These use case workloads should be data-driven and require large amounts of storage space, high IO performance, and power efficiency. Traditional file system-based approaches have limitations in terms of performance and scalability. This theme explores the development of a new storage architecture to address the challenges of AI/ML across storage layers.

While the demand for AI/ML at scale persists, however, it is increasingly difficult to find proper ML models and Use cases that openly available is bottlenecked by storage. One of the very first goal of this theme will be seeking for some AI/ML real world use cases that is storage bound.

We are highly interested in (but not limited to) the following list of topics:

- Storage Architecture for AI and ML workload
- Any component of AI/ML that can largely benefit from near storage compute
- Best storage Network for AI and HPC storage
- Sustainable Storage Solution
- Resilience and Reliability for High performance device
- Systems and architectures for large-scale ML applications

Requirements : Proposals without detailed description of following items will NOT be reviewed for selection.

- Minimum number of Project PI/Co-PI : 2; means Project Investigator (PI) must consolidate a set of interrelated projects aimed at addressing complex

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and shared challenge together. PI should actively collaborate with diverse and complementary PIs, adopting a comprehensive approach that tackles the problem from various angles instead of using a compartmentalized approach

- Propose a tightly structured project which includes technical and project that demonstrates clear progress, are aggressive but achievable, and are quantitative (Objectives and Key Result(OKRs), Key performance indicator).
- Clearly define the merit of the proposed innovation compared to competing approaches and the anticipated outcome. Ideally, this will include quantitative projections for performance improvement that are tied to representative values included in authoritative publications. Proposals should incorporate an assessment of the prospective product, supported by relevant justifications and a strategic plan for possible commercialization.
- Budget must include overhead cost and specific percentage charging rate. The budget allocation is designed to provide support for a minimum of two project investigators and student researchers for a duration of one year, as outlined in the provided details. (Max \$300,000/year)

## Information

- Collaborative projects must be submitted as a single proposal in which a single award is being requested : The involvement of partner organizations should be supported through subawards administered by the submitting organization.
- The duration of the award is subject to variation depending on the type of resource being funded, typically ranging 2 to 3 years (or potentially up to 5 years). Nevertheless, an annual update on project milestones will be required.
- Limit on Number of Proposals per PI (or co-PI): 1 ; Each individual PI is limited to participate one proposal.

Our research interest and related publications can be found in [MSL website](#). Topics related to our research will be highly considered.