Request for Information (RFI) on Implementing the Initial Findings and Recommendations of the National Artificial Intelligence Research Resource Task Force: Response

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**Compute Accounting**

Response to [RFI](#) on Implementing Initial Findings and Recommendations of the National Artificial Intelligence Research Resource Task Force

*The authors include an AI research scientist as well as policy researchers who specialize in AI policy. This comment pertains to topic letter “b” in the RFI—specifically the subsections on “resource allocation and sustainment” and “performance indicators and metrics.”*

In order to implement Recommendation 3-17 of the [interim report](#), the NAIRR management agency should develop and implement a system for “compute accounting,” standardized methods to track and audit the use of computational resources, analogous to Generally Accepted Accounting Practices (GAAP) for financial resources. As a federated mix of computational resources, the NAIRR will need a standardized system to track and audit compute usage across each component resource—ensuring that NAIRR resources are equitably distributed and are not misused.

Technology companies today already build tools to internally track compute resource usage. For example, in algorithmic stock trading, it is not uncommon to maintain a company-wide dashboard displaying how much compute is being used by which algorithms and for what purposes. Cloud computing platforms such as [Google Cloud](#) and [Amazon Web Services](#) offer similar services, but

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1 “Data should be gathered to support four levels of performance indicators [including] … (2) measures of resource usage/activities, including user diversity”
exact methods vary from company to company, and there is currently no industry-wide standard for compute accounting.

A compute accounting system implemented by NAIRR should incorporate two core features: measurement of floating point operations and scale sensitivity. Floating point operations (FLOPs) are the most widely-used metric for calculating compute expenditures because they are easily convertible across resource types and applications, at least within an order of magnitude difference in significance. The NAIRR’s compute accounting systems should similarly use FLOPs — or approximately-fungible equivalents, such as multiply-accumulate operations (MACs) — when estimating the computational expenditure for a given user or project. With FLOPs as a standard unit of measure, NAIRR’s compute accounting system could then implement scale sensitivity in its documentation requirements. Just as financial accounting practices have “materiality” thresholds, NAIRR’s compute accounting system should also be scale-sensitive—asking for greater documentation and transparency for large compute expenditures than for small ones.

If the NAIRR management agency knows how much compute was expended to train each ML model, it can estimate the risk of misuse and assess whether compute is equitably distributed. Larger models, which require more computational resources, generally carry higher risks. The NAIRR management agency could conduct internal audits of the largest (highest risk) projects, to ensure those allocated resources are not being misused. Furthermore, paired with demographic information on NAIRR users, compute accounting data could be used to calculate the share of NAIRR resources that is supporting researchers from traditionally underserved communities.

While compute accounting will mostly help NAIRR internally monitor resource usage, NAIRR can also serve as an example for a standardized, replicable approach to compute accounting. As a leading public compute resource, the NAIRR would be in a good position to develop a practical and easily accessible method of compute accounting that could in turn be adopted across industry and academia. Doing so would scale up the equity and safety benefits generated by compute accounting, and set a positive example for other institutions.
We encourage the NAIRR Task Force to incorporate compute accounting in its final report by adding the following to Recommendation 3-17:

1. The NAIRR management agency should work closely with NIST and industry leaders to develop:
   a. Standardized “compute accounting” methods that can be used to track resource usage across multiple resource types, professionally analogous to Generally Accepted Accounting Practices (GAAP) for financial accounting;
   b. Standardized auditing procedures to screen for and detect dangerous applications of computational resources.
2. For large expenditures of compute, the NAIRR management agency should:
   a. Require greater documentation and transparency,
   b. Conduct regular audits.

Thank you very much for your attention, and please don’t hesitate to reach out if you would like to further discuss this proposal.

Sincerely,

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