

# Appendix: Artifact Description/Artifact Evaluation

## Artifact Description (AD)

### I. OVERVIEW OF CONTRIBUTIONS AND ARTIFACTS

#### A. Paper's Main Contributions

Provide a list of all main contributions of the paper.

- $C_1$  This is the 1st contribution.
- $C_2$  This is the 2nd contribution.
- $C_3$  This is the 3rd contribution.

#### B. Computational Artifacts

List the computational artifacts related to this paper along with their respective DOIs. Note that all computational artifacts may be archived under a single DOI.

- $A_1$  <https://doi.org/YY.YYYY/zenodo.0XXXXX>
- $A_2$  <https://doi.org/ZZ.YYYY/zenodo.1XXXXX>
- $A_3$  <https://doi.org/ZZ.YYYY/zenodo.2XXXXX>

Provide a table with the relevant computational artifacts, highlight their relation to the contributions (from above) and point to the elements in the paper that are reproducible by each artifact, e.g., which figures or tables were generated with the artifact.

| Artifact ID | Contributions Supported | Related Paper Elements    |
|-------------|-------------------------|---------------------------|
| $A_1$       | $C_1$                   | Tables 1-2<br>Figure 3    |
| $A_2$       | $C_2$                   | Tables 2-3<br>Figures 1-2 |
| ..          |                         |                           |

### II. ARTIFACT IDENTIFICATION

Provide the following six subsections for each computational artifact  $A_i$ .

#### A. Computational Artifact $A_1$

##### Relation To Contributions

Briefly explain the relationship between the artifact and contributions.

##### Expected Results

Provide a higher level description of what outcome to expect from the corresponding experiments. Provide an explanation of how the results substantiate the main contributions.

Algorithm A should be faster than Algorithms C and B in all GPU scenarios.

##### Expected Reproduction Time (in Minutes)

Estimate the time required to reproduce the artifact, providing separate estimates for the individual steps: Artifact Setup, Artifact Execution, and Artifact Analysis.

The expected computational time of this artifact on GPU X is 20 min.

#### Artifact Setup (incl. Inputs)

**Hardware:** Specify the hardware requirements and dependencies (e.g., a specific interconnect or GPU type is required).

**Software:** Introduce all required software packages, including the computational artifact. For each software package, specify the version and provide the URL.

**Datasets / Inputs:** Describe the datasets required by the artifact. Indicate whether the datasets can be generated, including instructions, or if they are available for download, providing the corresponding URL.

**Installation and Deployment:** Detail the requirements for compiling, deploying, and executing the experiments, including necessary compilers and their versions.

#### Artifact Execution

Provide an abstract description of the experiment workflow of the artifact. It is important to identify the main tasks (processes) and how they depend on each other.

A workflow may consist of three tasks:  $T_1$ ,  $T_2$ , and  $T_3$ . The task  $T_1$  may generate a specific dataset. This dataset is then used as input by a computational task  $T_2$ , and the output of  $T_2$  is processed by another task  $T_3$ , which produces the final results (e.g., plots, tables, etc.). State the individual tasks  $T_i$  and provide their dependencies, e.g.,  $T_1 \rightarrow T_2 \rightarrow T_3$ .

Provide details on the experimental parameters. How and why were parameters set to a specific value (if relevant for the reproduction of an artifact), e.g., size of dataset, number of data points, input sizes, etc. Additionally, include details on statistical parameters, like the number of repetitions.

#### Artifact Analysis (incl. Outputs)

##### B. Computational Artifact $A_2$

Provide the same type of information as done for Computational Artifact  $A_1$ .

## **Artifact Evaluation (AE)**

### *A. Computational Artifact $A_1$*

#### *Artifact Setup (incl. Inputs)*

Provide instructions for installing and compiling libraries and code. Offer guidelines on deploying the code to resources.

#### *Artifact Execution*

Describe the experiment workflow. If encapsulated within a workflow description or equivalent (such as a makefile or script), clearly outline the primary tasks and their interdependencies. Detail the main steps in the workflow. Merely instructing to “Run script.sh” is inadequate.

#### *Artifact Analysis (incl. Outputs)*

- Provide a description of the expected results and a methodology for evaluating these results.
- Explain how the expected results from the experiment workflow correlate with the contributions stated in the article.
- For example, if the article presents results in a figure, the artifact evaluation should also produce a similar figure, depicting the same generalizable outcome. Authors must focus on these aspects to reduce the time required for others to understand and verify an artifact.

### *B. Computational Artifact $A_2$*

#### *Artifact Setup (incl. Inputs)*

#### *Artifact Execution*

#### *Artifact Analysis (incl. Outputs)*