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SC20 Workshop : PyHPC 2020 Submission Form

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Enter your title. Please use standard title capitalization. Use initial-caps for most words except prepositions. Also use initial-caps for both parts of hyphenated words.

Title

Accelerating Microstructural Analytics with Dask for Volumetric X-ray Imaging

Author/Presenter Information

Please use standard name capitalization, neither ALL CAPS nor all lower case.

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Indicate paragraph breaks by a blank line in the text field; all other text formatting will be lost.

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Upload your paper in PDF format only. Paper submissions must be a minimum of 6 pages, with an advised maximum of 10 pages including regular appendices but excluding references and any (optional) Artifact Description/Artifact Evaluation (AD/AE) appendices (please see next section). Submissions will be assessed solely based on the paper submission. Please note that all accepted papers will be published in the IEEE TCHPC Proceedings. The formatting instructions are available at the IEEE website. You can also use the template online on Overleaf.

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PyHPC supports SC's reproducibility initiative. PyHPC submitting authors are encouraged (but not forced) to complete this section to describe all computational artifacts their results rely on: software, data, and/or hardware. By clicking yes, you will be asked to answer additional questions related to your artifacts. By answering the questions, we will automatically generate the AD for your paper. No other action will be required.
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Are there computational artifacts such as datasets, software, or hardware associated with this paper?

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Artifact Description (AD)
Note: The AD appendix consists of the following sections, including *Artifacts Available* and the *Experimental Setup/ Modifications*.

Summarize the experiments reported in the paper and how they were run. (Example: We ran the NAS Parallel Benchmarks v3.3.1 on NERSC's Cori supercomputer with both Cray's version of MPICH 3.2.1 and with our SuperPGAS communication layer (v0.2), as described in the paper.). MathJax is enabled so you can enter LaTeX mathematical notation within \(...\) or \[...\].

We ran the microstrocture analytics code using dask on NERSC's Cori supercomputer, which enable using NERSC's JupyterHub with dask running on the back end as described in the paper. The proposed dask workflow is also amenable to run on AWS.

Artifacts Available

"Available" means that the provided URLs properly resolve, and that the author-created artifacts are persistently archived and have a global, unique identifier.

If you need further information, you can refer to the ACM web page that SC20 is following: https://www.acm.org/publications/policies/artifact-review-badging

Software Artifact Availability: see https://opensource.org/licenses/alphabetical

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URL/DOI List (separate line per URL/DOI)

https://github.com/InsightSoftwareConsortium/ITK
https://github.com/InsightSoftwareConsortium/itkwidgets
https://github.com/dani-lbnl/DXC2020/tree/master/images

Baseline experimental setup, and modifications made for the paper
Fill in whatever is relevant to your paper and leave the rest blank.

Relevant hardware details, e.g., system names, makes, models, and key components such as CPUs, accelerators, and filesystems.	
Operating systems and versions (e.g., "Ubuntu 17.10 running Linux kernel 4.13.0")	
Compilers and versions (e.g., "Clang++ v6.0")	
Applications and versions (e.g., "NAMD v2.13" or "SPEC CPU2017")	
Libraries and versions (e.g., "OpenMPI v3.1.0")	
Key algorithms (e.g., "conjugate gradient")	
Input datasets and versions (e.g., "Berkeley Segmentation Dataset: Test Image #296059 [color]")	http://dx.doi.org/doi:10.18126/

Modifications made for the paper: describe how the hardware and software listed in the previous section was improved or otherwise altered.

Output from commands that gather execution environment information — see example scripts at https://github.com/SC-Tech-Program/Author-Kit

Artifact Evaluation (AE)
Discuss the steps taken to help ensure the computational artifacts and results are trustworthy.

Describe controls your team put in place, statistics gathered, or other measures to make the measurements and analyses robust to variability and unknowns in the system. E.g., validation of accuracy and precision of timings, use of manufactured solutions or spectral properties, accounting for aleatoric and epistemic uncertainties, sensitivity of results to initial conditions, sensitivity to parameters and computational environment. Did you perform verification and validation studies? MathJax is enabled so you can enter LaTeX mathematical notation within \(...\) or \[...\].

Are you completing an Artifact Evaluation (AE) Appendix?

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