

## IPDPS 2025 Call for Papers



### **39th IEEE International Parallel and Distributed Processing Symposium June 3-7, 2025**

#### **IPDPS 2025 NOW OPEN FOR SUBMISSIONS**

- Authors must register their paper and submit an abstract by **Thursday, October 3, 2024**
- Authors must then submit full versions of registered papers by **Thursday, October 10, 2024** (firm deadline)
- All deadlines are end of day **ANYWHERE ON EARTH.**
- Before submitting, review the information under **WHAT/WHERE TO SUBMIT below.**

Authors are invited to submit manuscripts that present novel and impactful research in high performance computing (HPC) in parallel and distributed processing. Works focusing on emerging technologies, interdisciplinary work spanning multiple IPDPS focus areas, and novel open-source artifacts are welcome. Topics of interest include but are not limited to the following areas:

#### **Algorithms:**

This track focuses on algorithms for computational and data science in parallel and distributed computing environments (including cloud, edge, fog, distributed memory, and accelerator-based computing). Examples include structured and unstructured mesh and meshless methods, dense and sparse linear algebra computations, spectral methods, n-body computations, clustering, data mining, compression, and combinatorial algorithms such as graph and string algorithms. Also included in this track are algorithms that apply to tightly or loosely coupled systems, such as those supporting communication, synchronization, power management, distributed resource management, distributed data and transactions, and mobility. Novel algorithm designs and implementations tailored to emerging architectures (such as ML/AI accelerators or quantum computing systems) are also included.

#### **Applications:**

This track focuses on real-world applications (combinatorial, scientific, engineering, data analysis, and visualization) that use parallel and distributed computing concepts. Papers submitted to this track are expected to incorporate innovations that originate in specific target application areas, and contribute novel methods and approaches that address core challenges in their scalable implementation. Contributions include the design, implementation, and evaluation of parallel and distributed applications, including implementations targeting emerging architectures (such as ML/AI accelerators) and application domain advances enabled by ML/AI.

#### **Architecture:**

This track focuses on existing and emerging architectures for high performance computing, including architectures for instruction-level and thread-level parallelism; manycore, multicore, accelerator, domain-specific and special-purpose architectures (including ML/AI accelerators); reconfigurable architectures;

memory technologies and hierarchies; volatile and non-volatile emerging memory technologies; co-design paradigms for processing-in-memory architectures; solid-state devices; exascale system designs; data center and warehouse-scale architectures; novel big data architectures; network and interconnect architectures; emerging technologies for interconnects; parallel I/O and storage systems; power-efficient and green computing systems; resilience, security, and dependable architectures; and emerging architectural principles for machine learning, approximate computing, quantum computing, neuromorphic, analog, and bio-inspired computing.

### **Machine Learning and Artificial Intelligence (ML/AI):**

This track focuses on all areas of ML/AI that are relevant to parallel and distributed computing, including ML/AI training on resource-limited platforms; computational optimization methods for AI such as pruning, quantization and knowledge distillation; parallel and distributed learning algorithms; energy-efficient methods for ML/AI; federated learning; design and implementation of ML/AI algorithms on parallel architectures (including distributed memory, GPUs, tensor cores and emerging ML/AI accelerators); new ML/AI methods benefitting HPC applications or HPC system management; and design and development of ML/AI software pipelines (e.g., frameworks for distributed training, integration of compression into ML/AI pipelines, compiler techniques and DSLs). Papers submitted to the ML/AI track should emphasize new ML/AI technology that is best reviewed by ML/AI experts. Papers that emphasize core parallel computing topics applied to ML/AI workloads or applications benefitting from use of existing ML/AI tools should be submitted to the topic domain tracks rather than this ML/AI track.

### **Measurements, Modeling, and Experiments:**

This track focuses on experiments and performance-oriented studies in the practice of parallel and distributed computing. “Performance” may be construed broadly to include metrics related to time, energy, power, accuracy, and resilience, for instance. Topics include methods, experiments, and tools for measuring, evaluating, and/or analyzing performance for large-scale applications and systems; design and experimental evaluation of applications of parallel and distributed computing in simulation and analysis; experiments on the use of novel commercial or research accelerators and architectures, including quantum, neuromorphic, and other non-Von Neumann systems; innovations made in support of large-scale infrastructures and facilities; and experiences and methods for allocating and managing system and facility resources.

### **Programming Models, Compilers, and Runtime Systems:**

This track covers topics ranging from the design of parallel programming models and paradigms to languages and compilers supporting these models and paradigms to runtime and middleware solutions. Software that is close to the application (as opposed to the bare hardware) but not specific to an application is included. Examples include frameworks targeting cloud and distributed systems; application frameworks for fault tolerance and resilience; software supporting data management, scalable data analytics and similar workloads; and runtime systems for future novel computing platforms including quantum, neuromorphic, and bio-inspired computing. Novel compiler techniques and frameworks leveraging machine learning methods are included in this track.

### **System Software:**

This track focuses on software that is close to the bare high performance computing (HPC) hardware. Topics include storage and I/O systems; system software for resource management, job scheduling, and energy-efficiency; system software support for accelerators and heterogeneous HPC computing systems; interactions between the operating system, hardware, and other software layers; system software solutions for ML/AI workloads (e.g., energy-efficient software methods for ML/AI); system software support for fault tolerance and resilience; containers and virtual machines; specialized operating systems and related support for high-performance computing; system software for future novel computing platforms including quantum, neuromorphic, and bio-inspired computing; and system software advances enabled by ML/AI.

### **BEST PAPER AWARD**

The program committee will select a small set of papers as Best Paper finalists. One paper will be named the Best Paper.

## **BEST OPEN-SOURCE CONTRIBUTION AWARD**

IPDPS welcomes submissions with technical contributions of open-source tool and dataset artifacts relevant to the parallel and distributed computing community. The authors of accepted papers may identify their submissions to be considered for the Best Open-Source Contribution award. Such papers will be evaluated by a dedicated open-source tool and dataset artifacts committee. A small set of such papers will be identified as Best Open-Source Contribution finalists. One paper will be recognized with the Best Open-Source Contribution Award.

The two award categories are not exclusive; a paper can be nominated for both the Best Paper award and Best Open-Source Contribution award.

## **WHAT/WHERE TO SUBMIT**

Abstracts of at most 500 words must be submitted by October 3, 2024. Manuscripts must be submitted by October 10, 2024; To ensure fairness, no extensions will be given. Submitted manuscripts may not exceed ten (10) single-spaced double-column pages using 10-point size font on 8.5x11-inch pages (IEEE conference style), including all figures and tables. There is no page limit for references, which must be complete and include all author names for each reference cited. No supplementary sections or appendices are allowed beyond the stated page limit. The program committee will use a double-blind review process. Submitted manuscripts should not include author names and affiliations, or otherwise disclose the identity of the authors due to the double-blind review process.

The IEEE conference style templates for MS Word and LaTeX provided by IEEE eXpress Conference Publishing are available for download. [See the latest versions here.](#)

Files must be submitted by following the instructions at the IPDPS 2025 Submission Site (powered by Linklings). Authors must select a “primary” track for the submission; the primary track is the area most related to the paper’s contributions. An optional “secondary” track may also be selected.

## **GO TO THE IPDPS WEBSITE AT IPDPS.ORG TO SUBMIT YOUR PAPER**

## **REVIEW OF MANUSCRIPTS**

All submitted manuscripts will be reviewed by the Program Committee under a double-blind, two-round review process. Submissions will be judged on correctness, originality, technical strength, significance, demonstrated or potential impact, quality of presentation, and interest and relevance to the conference. Submitted manuscripts must NOT have appeared in or be under consideration for another conference, workshop, or journal.

A high-quality submission should articulate its contributions in multiple aspects:

- *Motivation.* Clearly state the paper’s objective and provide strong support to motivate the specific problem the submission addresses.
- *Limitations of state-of-art approaches.* Unambiguously discuss and distinguish the paper’s contributions from the most relevant and most recent prior works.
- *Key insights and contributions.* Clearly articulate the major insights that enable the described approach and make it effective. Clearly specify the novelty of these insights and how they advance state-of-the-art. Provide a list of key contributions including flagship theoretical or experimental results and improvement over the prior art.
- *Methodology.* Clearly specify key theoretical or experimental methodological details. Support the chosen methodological choices (e.g., cite the prior works that have evaluated their ideas using similar methodology). If a new methodology is adopted or theoretical assumptions differ from prior art, provide a detailed justification.
- *Limitations of the proposed approach.* Articulate all significant limitations of the proposed approach and identify conclusions that are sensitive to assumptions made in the paper.

*The Program Committee will assess submissions in the above aspects. Therefore, the authors should make these aspects clear when articulating their contributions.*

Authors will have the opportunity to respond to the reviewers' questions and provide clarifications before the first-round decisions are made. Some submissions may not be invited to submit a response/rebuttal; these submissions will be notified with an early-reject decision by December 3, 2024.

First round decisions – “accept,” “revise,” or “reject” – will be sent by December 19, 2024. Authors of papers in the “revise” category will have the opportunity to submit a new version of their papers addressing reviewers' comments. The revised submission and a cover letter explaining changes are due on January 23, 2025. An ensuing review will then provide decisions of “accept” or “reject”; papers will be rejected if the reviewers assess that the issues they raised were not satisfactorily addressed.

Notification of final decisions will be sent by February 4, 2025. Camera-ready papers are due on February 27, 2025.

Questions may be sent to [pc2025@ipdps.org](mailto:pc2025@ipdps.org).

### **ArXiv Submission Policy**

Having an arXiv paper does not prohibit authors from submitting a paper to IPDPS 2025. arXiv papers are not peer-reviewed and not considered as formal publications; hence, they do not count as prior work. Authors are not expected to compare against arXiv papers that have not formally appeared in conference or journal proceedings. Authors must follow the double-blind submission guidelines even if a submitted paper is already on arXiv. Authors are encouraged to use preventive measures to reduce the chances of accidental breach of anonymity (e.g., use a different title in the submission, or not upload/revise the arXiv version during the review period). Authors should not direct reviewers to arXiv versions of the paper; in their evaluations, reviewers will consider only the material in the submitted paper.

### **Guidance on Artificial Intelligence (AI)-Generated Text**

Tools like ChatGPT, Grammarly, or other AI assistants may be used to improve the submission presentation. However, authors will be held accountable for the accuracy of all information presented as well as for the contributions. [IEEE requires](#) that the use of any AI-generated text be disclosed in the paper's Acknowledgements section. The sections of the paper that contain AI-generated text must have a citation to the AI system used to generate the text.

### **Inclusive Description of Research Contributions**

Please consider making your research contribution description inclusive in nature. For example, consider using examples that are ethnicity/culture-rich, consider engaging users from diverse backgrounds if your research involves a survey, etc. Best efforts should be made to make the paper accessible to visually impaired or color-blind readers.

### **IPDPS 2025 IMPORTANT DATES**

- Abstract submissions: October 3, 2024
- Full manuscript submissions (double-blind): October 10, 2024 - FIRM DEADLINE
- Author response/rebuttal to reviews: December 3 – 6, 2024
- First round decisions: December 19, 2024
- Revised submissions due: January 23, 2025
- Final decisions: February 4, 2025
- Camera-ready versions due: February 27, 2025

### **2025 PROGRAM CO-CHAIRS**

- Michela Becchi, North Carolina State University
- Karen Devine, Sandia National Laboratories, ret.

## **2025 PROGRAM TRACK CO-CHAIRS**

### **Algorithms**

- Maxim Naumov (Meta)
- Albert-Jan Yzelman (Huawei Technologies)

### **Applications**

- Sanjukta Bhowmick (University of North Texas)
- Kara Peterson (Sandia National Laboratories)

### **Architectures**

- Amro Awad (University of Oxford)
- Antonino Tumeo (Pacific Northwest National Laboratory)

### **Machine Learning and Artificial Intelligence**

- Prasanna Balaprakash (Oak Ridge National Laboratory)
- Dong Li (University of California - Merced)

### **Measurement, Performance and Experiments**

- Alexandru Iosup (Vrije Universiteit Amsterdam)
- Tanzima Islam (Texas State University)

### **Programming Models, Compilers, and Runtime Systems**

- Franck Cappello (Argonne National Laboratory)
- Xipeng Shen (North Carolina State University)

### **System Software**

- Patrick Bridges (University of New Mexico)
- Sarah Neuwirth (Johannes Gutenberg University Mainz)

## **PROGRAM COMMITTEE MEMBERS**

*Visit website for updates*