BigSpatial 2024

Proceedings of the 12th ACM SIGSPATIAL International Workshop on
Analytics for Big Geospatial Data
(BigSpatial 2024)
Oct. 29, 2024, Atlanta, GA, USA

Editors:

Ashwin Shashidharan, Esri, CA, USA

Krishna Karthik Gadiraju, Juniper Networks, CA, USA

Varun Chandola, State University of New York at Buffalo, NY, USA

Ranga Raju Vatsavai, North Carolina State University, NC, USA

The Association for Computing Machinery, Inc.
1601 Broadway, 10th Floor
New York, NY 10019-7434

ACM COPYRIGHT NOTICE.

Copyright © 2021 by the Association for Computing Machinery, Inc (ACM). Permission to make digital or hard copies of portions of this work for personal or classroom use is granted without fee provided that the copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page in print or the first screen in digital media. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, to republish, to post on servers, or to redistribute to lists, requires prior specific permission and/or a fee. Request permission to republish from: Publications Dept. ACM, Inc. Fax +1-212-869-0481 or E-mail <permissions@acm.org>.

For other copying of articles that carry a code at the bottom of the first or last page, copying is permitted provided that the per-copy fee indicated in the code is paid through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

Notice to Past Authors of ACM-Published Articles

ACM intends to create a complete electronic archive of all articles and/or other material previously published by ACM. If you have written a work that was previously published by ACM in any journal or conference proceedings prior to 1978, or any SIG Newsletter at any time, and you do NOT want this work to appear in the ACM Digital Library, please inform permissions@acm.org, stating the title of the work, the author(s), and where and when published.

ACM ISBN: ISBN: 979-8-4007-1143-5/24/10

Additional copies may be ordered prepaid from:
ACM Order Department
P.O. BOX 11405
New York, NY 10286-1405
Phone: 1-800-342-6626 (USA and Canada)
+1-212-626-0500 (Global)
Fax: +1-212-944-1318
E-mail: acmhelp@acm.org
Printed in the USA

FOREWORD

Big data is an important area of research for data researchers and scientists. This area has seen significant interest from industry and federal agencies alike in the past decade. Within the realm of big data, spatial and spatio-temporal data are still one of the fastest-growing types of data. With advances in remote sensors, sensor networks, and the proliferation of location-sensing devices in daily life activities and common business practices, the generation of disparate, dynamic, and geographically distributed spatiotemporal data has continued to explode in recent years. In addition, significant progress in ground, air, and space-borne sensor technologies has led to unprecedented access to earth science data for scientists from different disciplines interested in studying the complementary nature of different parameters. Analysis of this data poses new challenges to researchers.

The 12th workshop on Analytics for Big Geospatial Data (BigSpatial '24) builds on the success of the previous eleven editions to bring together researchers from academia, government, and industrial research labs that are working in spatial analytics with an eye toward massive data sizes. The main motivation for this workshop stems from the increasing need for a forum to exchange ideas and recent research results, and to facilitate collaboration and dialog between academia, government, and industrial stakeholders. The workshop continues to provide a platform for researchers and practitioners engaged in addressing the big data aspect of spatial and spatio-temporal data analytics to present and discuss their ideas.

This year we received 8 technical submissions out of which 4 were selected for full presentations. The technical program also consisted of two invited talks. We hope that the BigSpatial workshop will continue to provide a leading international forum for researchers, developers, and practitioners in the field of data analytics for big geospatial data to identify current and future areas of research.

Ashwin Shashidharan, Esri, CA, USA
Krishna Karthik Gadiraju, Juniper Networks, CA, USA
Varun Chandola, State University of New York at Buffalo, NY, USA
Ranga Raju Vatsavai, North Carolina State University, NC, USA

ACKNOWLEDGEMENTS

We would like to thank the authors of all submitted papers. Their innovation and creativity have resulted in a strong technical program. We are highly indebted to the program committee members, whose reviewing efforts ensured in selecting a competitive and strong technical program. We would like to express our sincere gratitude to the invited speakers.

ORGANIZERS

WORKSHOP CHAIR
Ashwin Shashidharan, Esri, CA, USA

WORKSHOP CO-CHAIR
Krishna Karthik Gadiraju, Juniper Networks, CA, USA

STEERING COMMITTEE
Varun Chandola, State University of New York at Buffalo, NY, USA
Ranga Raju Vatsavai, North Carolina State University, NC, USA

PROGRAM COMMITTEE
Alexandre Sorokine, ORNL, USA
Anthony Filippi, Texas A&M University, USA
Bharathkumar Ramachandra, Stack AV, USA
Chunxue Xu, Oregon State University, USA
Dejun Teng, Shandong University, China
Emre Eftelioglu, Amazon, USA
Mai Dahshan, University of North Florida, USA
Mandar Chaudhary, eBay Inc., USA
Nicolas Meger, Université de Savoie - LISTIC laboratory, France
Samriddhi Singla, Meta Platforms Inc., USA
Surya Durbha, IIT Bombay, India
Xu Teng, Esri, USA
Zexi Chen, Tiktok Inc, USA

SPONSORS

CORPORATE SPONSORS

Platinum Sponsors

Bronze

ORACLE

esri

THE SCIENCE OF WHERE

Quantum Geometry LLC

Google

Table of Contents

PC-LMT: The Point Cloud Log Merge Tree for the Helena Point Cloud Database

Balthasar Teuscher and Martin Werner …….1-9

From Data to Application: Harnessing Big Spatial Data and Spatially Explicit Machine Learning Model for Landslide Susceptibility Prediction and Mapping
Khant Min Naing, Victoria Grace Ann and Tin Seong Kam…… ……10-19

DynoViz: Dynamic Visualization of Large Scale Satellite Data

Zhuocheng Shang, Suryaa Charan Shivakumar and Ahmed Eldawy ……....20-29

Geospatial Foundation Models: Recent Advances and Applications

Ranga Raju Vatsavai……..……...30-33