Jaewoo Shin

305 N. University Street – West Lafayette, IN 47907

+1 765 714 5588 • shin152@purdue.edu • nujwoo.github.io

Summary

Ph.D. candidate in Computer Science with 8+ years of experience as a full-stack developer. Interested in database systems, query processing, and data indexing, especially for spatial data. Passionate for learning new technologies, analyzing details, and enhancing performances.

Education

- **Purdue University** — **West Lafayette, IN**
  Ph.D. Candidate in Computer Science, GPA: 3.94/4.0 — *August 2013 – Present*
  Thesis: Efficient LSM Secondary Indexing for Update-intensive Workloads
  Advisors: Walid G. Aref and Jianguo Wang
  Expected Graduation: January 2023
- **Stony Brook University** — **Stony Brook, NY**
  B.S. in Computer Science, GPA: 3.75/4.0 — *August 2011 – August 2013*
- **Ajou University** — **S. Korea**
  B.S. in Information and Computer Engineering, GPA: 4.21/4.5 — *March 2006 – August 2011*

Experience

- **Research Assistant**
  Database Systems Lab, Purdue University — *August 2014 – Present*
  - Work on Log-Structured Merge-tree indexing techniques to enhance update performance of the data indexed on the secondary key. (ICDE 2021)
  - Provided an efficient indexing technique for spatial query processing by proposing a new data structure to achieve performance enhancements in distributed computing environments. (SIGSPATIAL 2019)
  - Developed Learning Programming using Interactive Map Activities (LIMO) system offering an environment for students to learn to program by providing interactive map operations. (SIGSPATIAL 2015 DEMO and VISION)
  - Implemented a parallel computing framework using Apache Hadoop and Spark for Similarity Group-by operator, which extends the semantics of the standard SQL Group-by query.
- **Senior Computational Scientist**
  Rosen Center for Advanced Computing, Purdue University — *October 2022 – Present*
  - Create software solutions for data-centric research applications and tools in collaboration with research groups.
  - Lead software developments that collect and manage large volumes of scientific data in a variety of formats and make the data usable for analysis, computation, and visualization by researchers.
  - Develop web-based science gateways that can index large volumes of scientific data efficiently to support interactive query, process, and delivery of data to end users.
- **Graduate Administrative/Professional**
  Rosen Center for Advanced Computing, Purdue University — *August 2014 – September 2022*

- Developed services for researchers in non-CS fields to manage, analyze and visualize data.
- Performed requirements analysis, service design, and back-end/front-end developments using various frameworks and programming languages. Implemented tools listed on `https://mygeohub.org/groups/gabbs/tools`

Technical Skills

- **Programming Languages:** Java, Python, C/C++, JavaScript, HTML/CSS, Scala, R
- **Systems/Frameworks/Libraries:** Kubernetes, Docker, Hadoop, Spark, AsterixDB, MongoDB, MySQL, PostgreSQL, InfluxDB, RabbitMQ, Node.js, Express.js, OpenStreetMap, Leaflet

Honors and Awards

- Young Professional of the Year Award, Science Gateways Community Institute, 2018
- Best Demonstration Award, ACM SIGSPATIAL 2015, 2015
- Outstanding Academic Achievement Award, Stony Brook University, 2012
- Academic Scholarships, Ajou University, 2009 - 2011

Publications

[1] **Jaewoo Shin**, Lan Zhao, Carol X. Song, Rajesh Kalyanam, Jian Jin, Jacob D. Hosen, Ananth Grama, and Dongyan Xu. Enabling Scalable and Reliable Real Time Data Services for Sensors and Devices in StreamCI. In *Gateways*, October 2022.

[2] Venkata Sai Gargeya Vunnava, **Jaewoo Shin**, Lan Zhao, and Shweta Singh. Piot-hub: A collaborative cloud tool for generation of physical input–output tables using mechanistic engineering models. *Journal of Industrial Ecology*, 26(1):107–120, 2022.

[3] **Jaewoo Shin**, Jianguo Wang, and Walid G Aref. The lsm rum-tree: A log structured merge r-tree for update-intensive spatial workloads. In *Proceedings of the 37th IEEE International Conference on Data Engineering (ICDE)*, 2021.

[4] **Jaewoo Shin**, Ahmed R Mahmood, and Walid G Aref. An investigation of grid-enabled tree indexes for spatial query processing. In *Proceedings of the 27th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (SIGSPATIAL)*, pages 169–178, 2019.

[5] Rajesh Kalyanam, Lan Zhao, Carol Song, Larry Biehl, Derrick Kearney, I. Luk Kim, **Jaewoo Shin**, Nelson Villoria, and Venkatesh Merwade. Mygeohub—a sustainable and evolving geospatial science gateway. *Future Generation Computer Systems (FGCS)*, 94:820–832, 2019.

[6] Nelson B Villoria, Joshua Elliott, Christoph Müller, **Jaewoo Shin**, Lan Zhao, and Carol Song. Web-based access, aggregation, and visualization of future climate projections with emphasis on agricultural assessments. *SoftwareX*, 7:15–22, 2018.

[7] Lan Zhao, Carol X Song, Rajesh Kalyanam, Larry Biehl, Robert Campbell, Leif Delgass, Derrick Kearney, Wei Wan, **Jaewoo Shin**, I Luk Kim, et al. Gabbs-reusable geospatial data analysis building blocks for science gateways. In *9th International Workshop on Science Gateways (IWSG)*, 2017.

[8] Nelson B Villoria, Joshua Elliott, Christoph Müller, **Jaewoo Shin**, Lan Zhao, and Carol Song. Rapid aggregation of global gridded crop model outputs to facilitate cross-disciplinary analysis of climate change impacts in agriculture. *Environmental Modelling & Software*, 75:193–201, 2016.

[9] Ruby Y Tahboub, **Jaewoo Shin**, Aya Abdelsalam, Jalaleldeen W Aref, Walid G Aref, and Sunil Prabhakar. Limo: learning programming using interactive map activities. In *Proceedings of the 23rd SIGSPATIAL International Conference on Advances in Geographic Information Systems (SIGSPATIAL)*, page 98. ACM, 2015.

[10] Walid G Aref, Sunil Prabhakar, **Jaewoo Shin**, Ruby Y Tahboub, Aya Abdelsalam, and Jalaleldeen W Aref. On map-centric programming environments: vision paper. In *Proceedings of the 23rd SIGSPATIAL International Conference on Advances in Geographic Information Systems (SIGSPATIAL)*, page 15. ACM, 2015.