Khaled Z. Ibrahim

COMPUTER SCIENTIST · COMPUTATIONAL RESEARCH DIVISION · LAWRENCE BERKELEY NATIONAL LABORATORY

One Cyclotron Road, 059-4024N, M/S 59R4104, Berkeley, CA 94720

(510)679-9139 | ✉ kzibrahim@lbl.gov | ⌂ crd.lbl.gov/departments/computer-science/CLaSS/staff/khaled-ibrahim

Computer Scientist Hiring Committee   *October 20, 2018*

2575 SAND HILL ROAD, MENLO PARK, CA 94025

Dear SLAC hiring committee,

I am submitting my resume and research statement for your consideration for the computer scientist/senior scientist position (Job #: 2157). Currently, I am a tenured computer scientist at Lawrence Berkeley National Laboratory in the Computer Languages & Systems Software (CLaSS) Group, and an affiliate of the computer architecture (CAG) and the performance and algorithm (PAR) groups.

My research interests include both basic computer science (parallel architecture and runtime systems) and cross-disciplinary activities, such as optimizing simulation codes of quantum chromodynamics simulation, turbulence in plasma fusion, and quantum chemistry using tensor contractions.

For performance analysis and tuning research, I targeted multi/many-core architectures (e.g., Intel Haswell, Intel KNC/KNL), GPU-accelerated architectures (e.g., nVidia GPUs), and light-weight many-core architectures (e.g., IBM BGQ). Moreover, I contributed to optimizing communication runtimes including MPI and GASNet, improving their performance on many-core architectures and virtual computing environments. I conducted research in architecting power-efficient embedded designs and high-performance speculation mechanisms for parallel processing.

In addition to best paper awards, I won the HPC Challenge Award for the best FFT performance on 49K cores Mira in Supercomputing 2014 (runner up for GUPS and HPL), and two top-ten positions in Graph500 in Supercomputing 2016. I helped develop and scale plasma turbulence simulation to 98K cores and scaled coupled cluster (CCSD) computation to tens of thousands of cores. Leveraging years of research in parallel architectures, runtime systems, and application performance tuning, I adopt cross-layer optimization strategies to push the performance boundary on extreme-scale supercomputers.

By joining SLAC, I aim to advance the computational performance and efficiency in future exascale computing systems in various scientific research disciplines, including elementary particle physics, and astrophysics and cosmology. I have always had the aspiration for putting computational resources as a vehicle for scientific discoveries.

I believe the post-Moore's law computing era will significantly impact HPC computing. Specifically, current trends for constructing efficient architectures would significantly influence the strategies for scientific code development. In my research statement, I share my views on how to achieve and maintain leadership in scientific discoveries in the exascale era and beyond.

I would be glad to provide further details if my skills match the position. **I also hope to maintain confidentiality in processing my application.**

Sincerely,

Khaled Z. Ibrahim

Attached: Curriculum Vitae, Research Statement