



COLLEGE OF ENGINEERING

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November 22, 2021

Lawrence Berkeley National Laboratory
1 Cyclotron Rd
Berkeley, CA, 94720

Dear members of the Postdoc Fellowship Committee:

I am writing you to apply for the Luis J. Alvares and Admiral Grace M. Hopper Postdoc Fellowship in Computing Sciences. As I am in my final stage of my PhD program in electrical and computer engineering at University of Illinois at Urbana-Champaign, I expect to graduate by May 2022.

Since my undergraduate studies, I have conducted a body of work addressing computational challenges to solve large-scale problems on parallel systems with high performance. I optimized fast (low-complexity) algorithms on leadership-class supercomputers, including NCSA Blue Waters, ALCF Theta, OLCF Summit. The pertaining challenges that I have experienced are the memory and communication walls. These challenges are mainly due to the low arithmetic intensity and irregular data accesses of such applications and the discrepancy between Moore's law and performance of memory & interconnect systems in massively-parallel computers. To address, I have positioned my PhD research on utilizing on-chip memory and registers for high-granular and high bandwidth memory accesses, and optimizing communications for hierarchical communication topology of systems with multi-GPU nodes.

My motivation on applying for this position is to pursue my post-doc research on addressing the memory and communication walls for algorithms that are used in a plethora of applications, by extending my previous work on exascale computers. I believe my previous experience will allow me to collaborate with not only the Berkeley Lab researchers, but also industry partners and academic institutions to utilize exascale systems to solve related challenging problems. I am confident that Berkeley Lab will give the right opportunity to conduct cutting-edge research in order to contribute to the supercomputing community for the benefit of our society.

Enclosed, please find my application materials, involving a brief description of my research portfolio, my CV, and my research plan that aligns with the Luis J. Alvares and Admiral Grace M. Hopper Postdoc Fellowship in Computing Sciences. I will ask my doctoral advisor Wen-mei Hwu, director of IBM-Illinois center Jinjun Xiong, and Argonne DSL director Ian Foster to send their respective reference letters by 29 November 2021.

Yours sincerely,

Mert Hidayetoglu
2021 ACM/IEEE-CS George Michael Memorial HPC Fellow
PhD Candidate at ECE Illinois