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NEWS RELEASE

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MILINDA FERNANDO AND STACI SMITH NAMED RECIPIENTS OF 2019 ACM-IEEE CS GEORGE MICHAEL MEMORIAL HPC FELLOWSHIPS

New York, NY, August 15, 2019 – ACM, the Association for Computing Machinery, announced today that Milinda Shayamal Fernando of the University of Utah, and Staci Smith of the University of Arizona are the recipients of the [2019 ACM-IEEE CS George Michael Memorial HPC Fellowships](#). Fernando is recognized for his work on high performance algorithms for applications in relativity, geosciences and computational fluid dynamics (CFD). Smith is recognized for her work developing a novel dynamic rerouting algorithm on fat-tree interconnects. The Fellowships are jointly presented by ACM and the IEEE Computer Society.

Milinda Fernando

New discoveries in science and engineering are driven by simulations on high performance computers—especially when physical experiments would be unfeasible or impossible. Fernando’s research is focused on developing algorithms and computational codes that enable the effective use of modern supercomputers by scientists working in many disciplines.

His key objectives include making computer simulations on high performance computers: *easy to use* (by using symbolic interfaces and autonomous code generation); *portable* (so they can be run across different computer architectures); *high-performing* (because they make efficient use of computing resources); and *scalable* (so that they can solve larger problems on next-generation machines).

Fernando’s current focus has enabled improved applications in areas of computational relativity and gravitational wave (GW) astronomy. In the universe, when two supermassive black holes merge, they bring along corresponding clouds of stars, gas and dark matter. Modeling these events requires powerful computational tools that consider all the physical effects of such a merger. While recent algorithms and codes to develop simulations of black hole mergers have been developed, they were limited because they could only handle simulations when the masses of the two black holes were comparable. Fernando developed algorithms and code for mergers of black holes, or neutron stars, of vastly different mass ratios. These computational simulations help scientists understand the early universe as well as what is going on at the heart of galaxies.

Staci Smith

A general problem in high performance computing occurs when multiple distinct jobs running on supercomputers send messages at the same time, and these messages interfere with each other. This inter-job interference can significantly degrade performance.

Smith's first research paper in this area, "Mitigating Inter-Job Interference Using Adaptive Flow-Aware Routing," received a Best Student Paper nomination at SC18, the premiere supercomputing conference. Her paper had two goals: to explore the causes of network interference between jobs (in order to model that interference) and to develop a mitigation strategy to alleviate the interference.

As a result of this work, Smith recently developed a new routing algorithm for fat-tree interconnects called Adaptive Flow-Aware Routing (AFAR), which improves execution time up to 46% when compared to other default routing algorithms. As part of her ongoing PhD research, she continues to develop algorithms to improve the performance and efficiency of HPC workloads.

About the ACM-IEEE CS George Michael Memorial HPC Fellowship

The ACM-IEEE CS George Michael Memorial HPC Fellowship is endowed in memory of George Michael, one of the founding fathers of the SC Conference series. The fellowship honors exceptional PhD students throughout the world whose research focus is on high performance computing applications, networking, storage or large-scale data analytics using the most powerful computers that are currently available. The Fellowship includes a \$5,000 honorarium and travel expenses to attend [SC19](#) in Denver, Colorado, November 17-22, 2019, where the Fellowships will be formally presented.

About ACM

[ACM, the Association for Computing Machinery](#), is the world's largest educational and scientific computing society, uniting computing educators, researchers and professionals to inspire dialogue, share resources and address the field's challenges. ACM strengthens the computing profession's collective voice through strong leadership, promotion of the highest standards, and recognition of technical excellence. ACM supports the professional growth of its members by providing opportunities for life-long learning, career development, and professional networking.

About SC

[SC, the International Conference for High Performance Computing](#), sponsored by ACM and IEEE-CS offers a complete technical education program and exhibition to showcase the many ways high performance computing, networking, storage and analysis lead to advances in scientific discovery, research, education and commerce. This premier international conference includes a globally attended technical program, workshops, tutorials, a world class exhibit area, demonstrations and opportunities for hands-on learning.

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