

SMTPS Keynote: Research and Technology Advances in Systems Software for Large Scale Computing Systems

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The talk will address research and technology advances for optimized and dependable execution in large scale computing environments. Applications in nearly all sectors, scientific, engineering, and commercial, are becoming more encompassing in including the behaviors of the systems they represent, and becoming at the same time more powerful but also more complex. At the same time, driven by application requirements and enabled by hardware technology advances, computational platforms are becoming as well increasingly more powerful but also more complex. Efficient and effective development of applications, optimized use of the computational resources, and guaranteeing quality of service and dependability at all layers of the computational system, requires systems software advances, such as in programming environments, application composition systems, optimized application mapping and dynamic runtime technologies, debugging and check-pointing methods, and performance-engineered hardware and software capabilities at all layers. An overarching consideration, and thesis of this talk, is that these advances need to be made in a synergistic and integrated manner, taking a systems-view in developing these enabling technologies, rather than advancing each of the individual technologies in an isolated manner.