

Title: Moving Volunteer Computing Towards Data-Driven, Knowledge-Constructed Capabilities.

Abstract:

Volunteer Computing (VC) can potentially provide PetaFlops of effective computation. The VC paradigm allows any user who has an Internet-connected PC to donate computing and storage resources to projects. The VC community comprises volunteers that donate their cycles of computing, and scientists that take advantage of the results received from the volunteers. Volunteers expect that their cycles are used in meaningful computations, and scientists expect to compute and receive trusted results. Any decision that affects these expectations compromises the viability of the VC project.

In this talk I present new tools and techniques that support VC to meet these expectations in both communities by combining data-driven scheduling policies for adaptive resource employment and knowledge-constructed environments for run-time scientific enquiries. In particular I show how VC projects in the biomedical sciences such as Docking@home, a project under development in my group that targets the search for putative drugs, and Predictor@home, a project I have developed at the Scripps Research Institute in 2004 that targets the prediction of protein structures from their sequences of amino acids, can benefit from these data-driven and knowledge-constructed capabilities.

Bio:

Michela Taufer is an Assistant Professor at the Department of Computer Science at the University of Texas-El Paso. Her research interests include new algorithms and architectures for resource- and time-expensive applications in biomedical sciences as well as effective migrations of large-scale simulations to volunteer computing and grid computing systems. She earned her MS in Computer Engineering from the University of Padua and her Ph.D. in Computer Science from the Swiss Federal Institute of Technology (ETH).