A General Economic Equilibrium Model of Distributed Computing

Chapter

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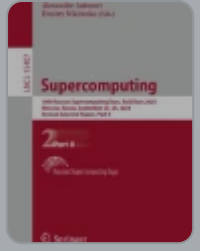
depend on the average flow of services and that user choices can be modeled as a stochastic arrival process. This representation may be a more realistic model of a group of users than the more straightforward discrete choice model. Within the context of this model, we characterize optimal system allocations, and prove the existence of stochastic equilibrium rental prices such that total expected demand does not exceed optimal system capacity utilization. The profit measures for each PU can be used to guide the evolution of the distributed computing system. We also propose a tatonnement process for guiding the system towards equilibrium. Since only limited general convergence theorems are available, we propose simulation testing of the dynamic properties. Future research will explore the performance of the pricing mechanism in experimental environments and eventually in actual usage.



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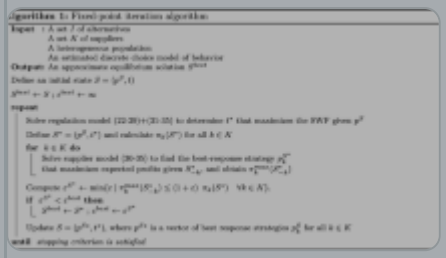

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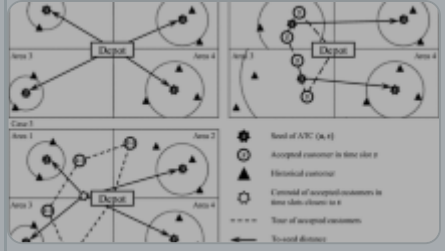

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