A Smartphone-based Infrastructure for Decentralized Partnership Formation

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Distributed computing infrastructures have expanded over time from centralized computing clusters to decentralized wide area networks of heterogenous devices. The latter can range from supercomputers to low-powered mobile devices. In particular, the rapid development of smartphone computing opened up new areas of research in distributed computing. With many-core CPUs and hundreds of gigabytes of storage, today's smartphones are capable to perform complex tasks that only mainframes could run a couple of decades earlier. Not only are smartphones capable of performing complex computations, but they are also able to support network intensive applications. This creates the potential for building distributed applications on top of ad-hoc mobile networks that leverage the spatial locality of devices to share and process data locally at lower latencies compared to a cloud-based infrastructure. In this thesis we introduce and evaluate a distributed infrastructure in which mobile nodes organize and share data in a decentralized manner. In particular, we focus on ad-hoc networks of smartphones that self-organize into groups based on similarity. Our infrastructure consists of components that are grouped on layers based on their computation and communication capabilities, which aims at providing structured access to data.

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