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Thesis Title: **DEADLOCK AVOIDANCE IN DISTRIBUTED SERVICE ORIENTED ARCHITECTURES**

ABSTRACT:
A distributed service-oriented architecture comprises interconnected machines that together support a number of services. Concurrent service requests made to an individual machine are supported with shared, and limited, resources associated with that machine. A call to a service method may in turn invoke methods from other services, resulting in a nesting of service calls that is represented by a call tree. Deadlock occurs when a circular dependence is formed as a result of requests (calls) waiting for machine resources to be released by other requests. A deadlock avoidance technique is derived from Dijkstra's Banker's Algorithm that accepts or denies preferred scheduling and method-to-machine assignments proposed by underlying policies. Assumed to be known and available are estimates for the resource requirements of methods and the structures of the call trees. Simulation studies are conducted that demonstrate the effectiveness of the approach in avoiding deadlock, while not degrading (and in most cases improving) the performance of the underlying policies.