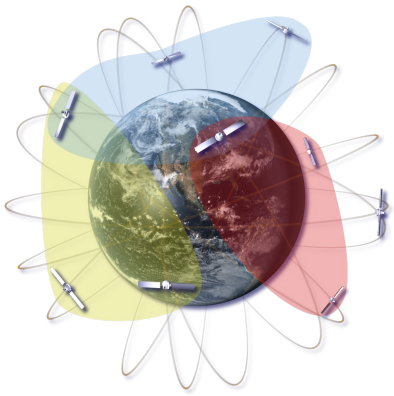
K B S

Diploma-/Masterthesis

Distributed Swarm Operating System



Frequently developers for mobile distributed systems are confronted with aspects like consistency, synchronization as well as concurrency. In many situations it seems appropriate or even necessary to split an application into several components that are scheduled for execution among different nodes of the runtime system. If there is further cooperation among the components required, the programmer is responsible to organize coordination.
In order to abstract from these issues and to facilitate application development, we focus on the design and concept of a distributed mobile operating system that on the one hand guarantees transparencies while on the other hand supports mobility awareness. Especially, communication and synchronization shall be transparent to the application. FlockOS - federation of linked objects with common tasks operating system - provides a systemic view on global system resources by abstracting from single devices.

In the context of this research area, we want to address several topics that need to be further investigated and analyzed. The following shall give an overview:

- Localization of robots (without GPS): Design of 2D codes that need to be arranged on a map and can be scanned by a robot in order to determine its position.
- Motion models: movement and positioning of robots in order to execute location-based applications
- Communication models
- Cooperation models: Coordination in order to collectively execute an application
- Virtual swarms: Logical partitioning in order to group elements
- Fault tolerance: tolerate node failures
- Energy-efficiency

Knowledge in the following areas is advantageous:

- Distributed systems
- Distributed algorithms
- Operating systems
- Middleware

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