

Hovering Information



Project Leaders

Giovanna Di Marzo Serugendo
 dimarzo@dcs.bbk.ac.uk
 Dimitri Konstantas
 dimitri.konstantas@cui.unige.ch

Project staff

Alfredo A. Villalba Castro
 alfredo.villalba@cui.unige.ch

Project Partner

University of Geneva (CH)

Project Details

PhD Project
 Swiss Government Funding

Project Web Site

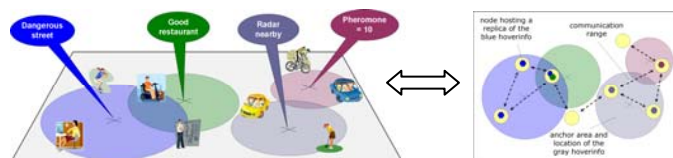
<http://www.dcs.bbk.ac.uk/~dimarzo/projects/HoverInfo.html>

Keywords

Self-organising, MANETs,
 Information Dissemination,
 Location-aware services

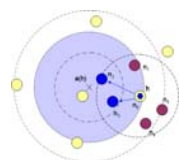
Concept and System

Hovering Information is a self-organising user-generated location-aware information dissemination service over a dynamic set of mobile devices (nodes). Pieces of hovering information are attached to an anchor area/location and replicas of pieces are stored in different nodes of limited buffer size. The service works without making any use of a server.

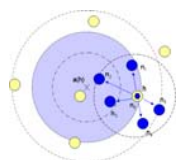


Attractor Point and Location-Based Caching

One of the main dependability requirements of hovering information is to keep itself available at its anchor area by actively replicating itself: Attractor Point Algorithm (AP) with replication factor K_{R_i} and by caching the most relevant replicas: Location-Based Caching (LBC). Other benchmark algorithms: Broadcast-Based replication algorithm (BB), Generation-Based Caching (GBC) and no caching (None).



Attractor Point Replication



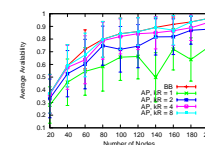
Broadcast-based Replication

Potential Applications

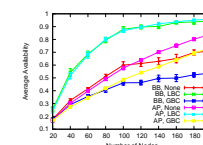
Stigmergy-based systems (exploring robots), disaster areas (rescue systems) and vehicle networks (traffic management).

Critical Number of Nodes and Absorption Limits

Simulations showed that at least three nodes per anchor area are required to get high availability rates and that the absorption limits of the system have not been reached meaning that the system is scalable.



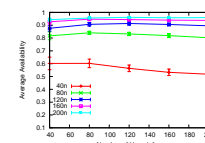
Availability – 1 hoverinfo



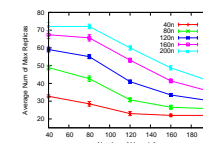
Availability - 200 hoverinfos – 20 buffer

Load-Balancing – Emergence Property

Simulations showed that a load-balancing property emerges allocating in an optimal way the different replicas among the buffers of the nodes.



Availability – AP with LBC - 200 nodes



Max Replicas – AP with LBC - 200 nodes

Publications

- [1] A. Villalba Castro, G. Di Marzo Serugendo, and D. Konstantas. *Hovering information – self-organising information that finds its own storage*. In IEEE International Conference on Sensor Networks, Ubiquitous and Trustworthy Computing (SUTC'08), 2008
- [2] A. Villalba Castro, G. Di Marzo Serugendo, D. Konstantas, *Hovering Information: Infrastructure-Free Self-Organising Location-Aware Information Dissemination Service*, 2nd ERCIM Workshop on eMobility, 2008