

Scalable Vector Graphics for SAiMotion

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Keywords

Scalable vector graphics, SAiMotion, nomadic information systems, situation awareness, location based services, personal task management

Motivation

Mobile computers support users to achieve their personal goals. The ubiquitous personal digital assistants (e.g. PDAs, PalmPilots, PocketPCs, Smartphones etc.) help to manage and optimize activity sequences and suggest optimal tasks for present situations. Beside efficient personal task management, the visualization of activities and information as well as interaction techniques are a matter of research. For a smooth interaction with the visualization of maps and surroundings, in general, scalable vector graphics are the most suitable. For mobile devices, the feature of continuous zooming, small image sizes and clickable objects prove useful. The open standard of the scalable vector graphics SVG was leading to different SVG definitions regarding application platform (e.g. standard, basic, tiny) and resource availability.

The Fraunhofer Institute for Computer Graphics, Rostock division, is using the techniques of scalable data for visualization of personal activities. The requirement of a representation of activities can differ by the actual user context. To support a concise presentation, major goals are :

- Spatial representation to visualize where activity occurs (e.g. for routing information)
- Time representation of tasks (e.g. for scheduling)
- Textual representation by lists, continuous text, and hierarchies (e.g. for exhibits, talks)
- Presentation of the priority of the tasks by the intensity of colors in graphical overviews,
- Other representation techniques.

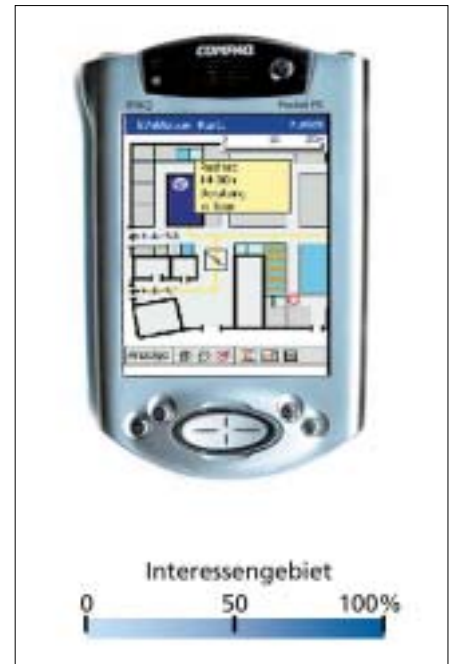


Figure 1: graphical presentation of spatial information, importance of activities by color intensity

German Abstract

Mobile, persönliche Informationssysteme setzen auf immer kleineren Endgeräten (PDAs, Smartphones) auf, die neben der höheren Handlichkeit jedoch die Nutzung des graphischen Interfaces erschweren. Durch die Entwicklung eines speziell für die Bedürfnisse eines mobilen Endgerätes angepassten Graphikmoduls wird eine effektive Nutzbarkeit von Geräten mit geringen Ressourcen erreicht. Diese Graphikengine eignet sich besonders zur graphischen Darstellung des zeitlichen Verlaufs von persönlichen Aufgaben und wird auf der CeBIT 2003 auf dem Fraunhofer Gemeinschaftsstand im Rahmen des Projektes SAiMotion¹ demonstriert.

Information Visualization

The advantage of mobile devices can be seen on trade shows and exhibitions. Electronic exhibitor guides help the user to find a certain company or exhibit, required facilities or it can simply give information at a glance. Currently, the user's position is not known by the device. Although suitable sensors exist (e.g. WLAN, Bluetooth, Infrared or GSM Cell Information), it is currently unusual for a PDA based fair guide to estimate and display the present location of the user and the favored destination. In the research project SAiMotion, new sensor technologies are investigated. The received information can be displayed by an adapted SVG map engine. This engine is capable of displaying the points of interest, such as tour items and the planned route of the

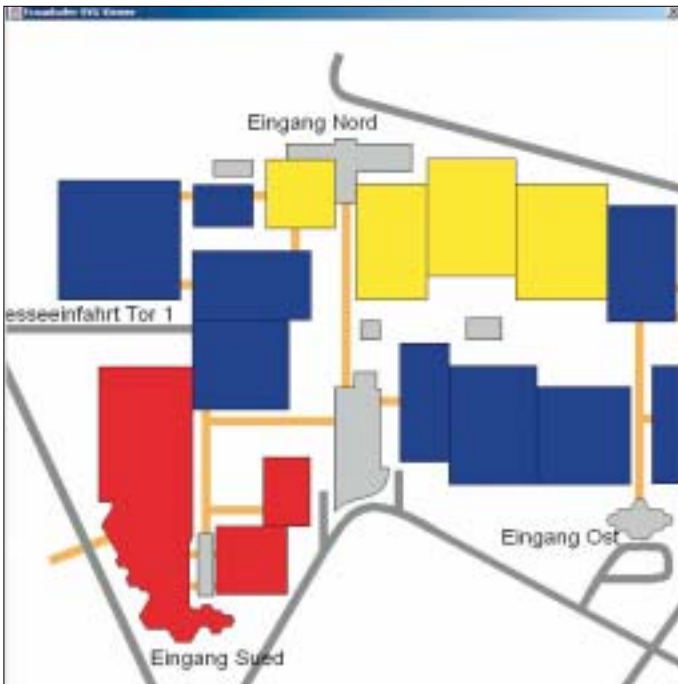


Figure 2: scalable vector graphic, easy but meaningful figures by abstracted information

tour. To find the best way through the different targets, a task scheduling algorithm can be implemented by the Fraunhofer IGD. Thus, the best personal route through the exhibition can be displayed along with an estimation of the duration of the entire journey. These techniques have to consider the constraints of limited resources of mobile devices. To meet this requirement we use the situation awareness approach. This enables us to find the current activity and reduce the amount of data to be visualized.



Figure 3: activities overview (personal tour) in a graphical representation

This can be achieved by selecting the most suitable information for the present context. To determine a set of personal tasks three basic methods are conceivable. The easiest way is the creation of the tasks by the user. This manual generation is very simple but requires some effort of defining or changing the required parameters.

The second method of task creation is using a planning system. The planner is based on a computer algorithm which generates specific tasks under implementation of a planning strategy. Well known examples of a planner are systems for spacecrafts [aspenn00], using a goal as the input and supplying a plan with all tasks to execute in the orbit. The planner can be one complex algorithm as well as a distributed system, the tasks can be generated separately by different workflow management systems or manually between e.g. an agency and its sales representatives. The third possibility is the use of a template. For a specific goal a template of tasks can be generated by the use of stereotypes or appraisal of recommendation systems. For instance, a journalist who likes to visit a trade show can receive a template of a selected list of exhibitors which might represent the assortment of points of interest. Within the project SAiMotion we plan to evaluate the results of per-

sonal activity scheduling and graphical representation beside the CeBIT 2003 in events like the information and communication days of the state Mecklenburg-Vorpommern (luK 2003) and the International workshop on Mobile Computing IMC 2003 in Rostock, (www.imc-conference.org).

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