

Location Based & Context-Aware Systems

Context-based City & Museum Tour Guides

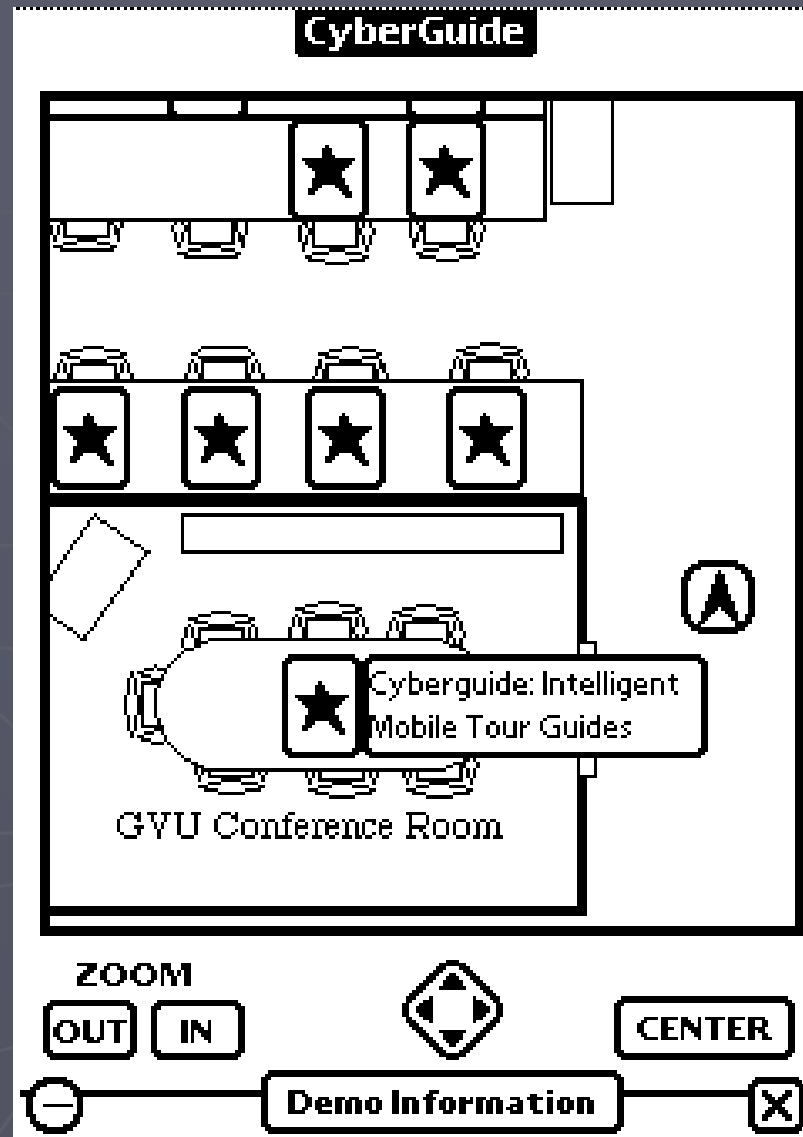
Readings by
Abowd, Cheverst, Reinhard, Petrelli

*Presented by Jamie Cooley
Ambient Technologies, MIT Media Lab*

The Cyperguide project

- ▶ Sue Long, Dietmar Aust, Gregory D. Abowd, & Chris Atkeson
- ▶ Early example of context aware research (early to mid 1990's)
- ▶ Uses Apple Newton PDA
- ▶ Vision: the interface will follow the user, not the other way around

The Cyperguide project



The Cyperguide project – System Architecture

- ▶ Map
 - The visitor uses this view to navigate
- ▶ Information Base
 - Pen touch on hypertext of a “demo”
- ▶ Positioning System
 - IR beacons
- ▶ Communication System
 - Application-level protocol on top of AppleTalk

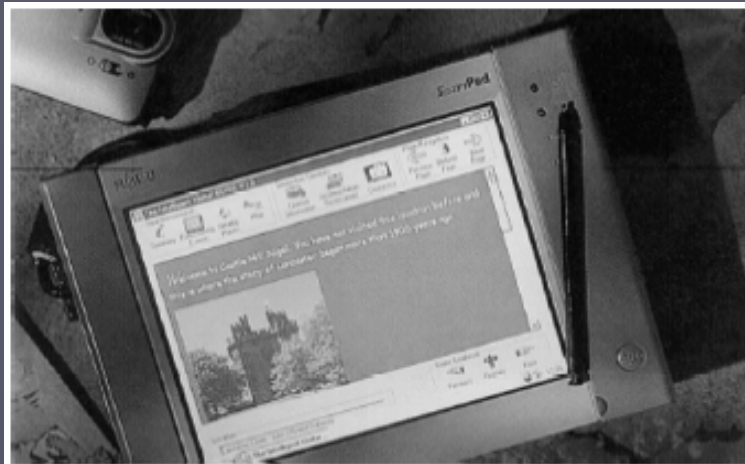
The Cyperguide project – Lessons

- ▶ 6 months, 3 versions
- ▶ Context aware applications can be cost-effective
- ▶ Absolute positioning information within a space is not that important... better to sense/locate a person around a particular object rather than pinpoint location everywhere
- ▶ Separate location and communications system. Communications services need to be everywhere, location awareness needs not be (as mentioned above)

Experiences of Developing and Deploying a Context-Aware Tourist Guide: The GUIDE project

- ▶ Keith Cheverst, Nigel Davies, Keith Mitchell, and Adrian Friday
- ▶ Hand-held, context-aware tourist guide based on Fujitsu TeamPad, dependant on Cellular Connection
- ▶ Lancaster, UK
- ▶ Highly individualized, customized system

GUIDE



Welcome to Lancaster Keith

Thanks for choosing me as your Guide to Lancaster. You can find information on the city by pressing any of the buttons at the top of my display. If you would like me to construct a tour for you then press the button labelled 'follow a tour' at the bottom of my screen.

If you need help at any time please don't hesitate to ask me by pressing the Help button.

Your location will

The Tourist Information Centre

Status

Currently receiving location updates

Tour Guide / Route Guidance

Follow
A
Tour

Repeat
Last
Instruction

Show
Next
Instruction

Interactive Services

Message

Text

GUIDE

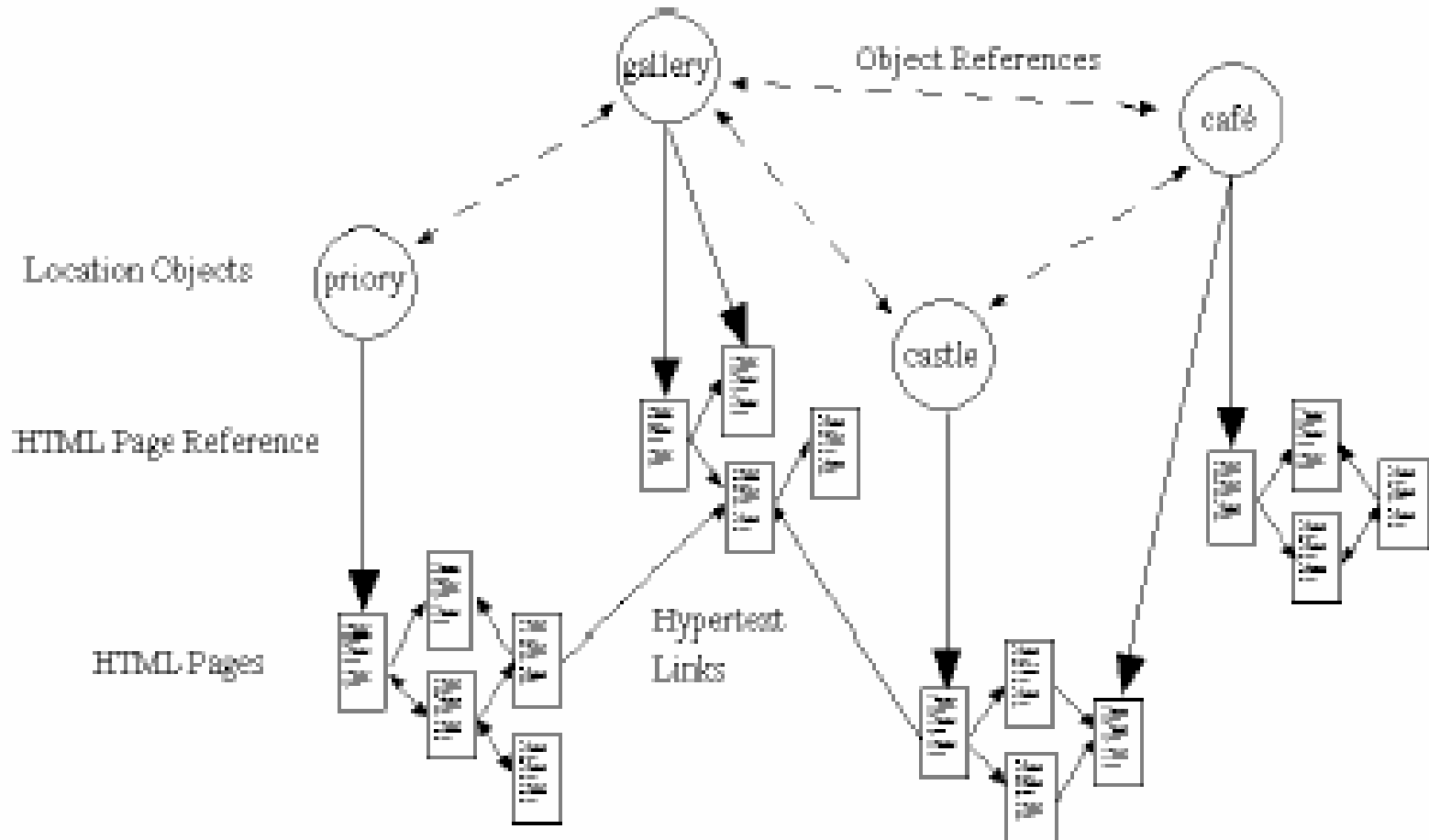


Figure 3: The GUIDE information model.

GUIDE

The screenshot shows a web browser window titled "The Lancaster GUIDE Project : http://www.guide.lancs.ac.uk/". The browser's address bar and toolbar are visible at the top. The main content area displays the following text:

The following attractions are near to you now.

Note: The list below is ordered according to closeness and whether or not they are open or closed.

Below the text, there are two rows of attraction information:

- The first row features a black and white photograph of a large stone building with a central tower, identified as [John O'Gaunt Gateway](#).
- The second row features a black and white photograph of a small, single-story stone building, identified as [The Cottage Museum](#).

At the bottom of the browser window, there are three panels:

- Your location call:** The Tourist Information Centre
- Status:** Currently receiving location updates
- Tour Guide / Route Guidance:** Includes buttons for "Follow A Tour", "Repeat Last Instruction", and "Show Next Instruction".
- Interactive Services:** Includes buttons for "Message" and "Go to Website".

GUIDE – Application Functionality

▶ Access Context-Aware Information

- Based on current location (cell) present info local to that spot
- Findings also demonstrated that system should not OVER-RESTRICT information available at a given spot... providing access to any information is better

▶ Create a Tailored Tour of the City

- Based on personal preference on sites a user would like to visit

▶ Access Interactive Services

- i.e., book hotels, query movies currently playing and book seats

▶ Send and Receive Messages

- Keep in touch with other GUIDE users as well as Tourist Info Center people

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GUIDE – Followup

- ▶ Concern that GUIDE would lead to less social interaction between visitors, actual tour guides, members of the Tourist Information Center
- ▶ Privacy Concerns – people may be unwilling to allow the system to know their location

...plus a whole lot more on how the Information model is organized

A Context-sensitive Nomadic Information System as an Exhibition Guide

- ▶ Reinhard Oppermann and Marcus Specht
- ▶ “Hippie” system that is Nomadic
- ▶ Nomadic = User has access to both his/her personal information space as well as public information space
- ▶ Designed for an art exhibition

Hippie

- ▶ Models to identify context of use
 - A **domain model** describes and classifies the objects of the domain information are to be presented and processed about (i.e. Religion & Magic, Nature, History,... taxonomy)
 - A **space model** describes the physical space where the nomadic system is used and the location of the domain objects in the space (infrared indoors, GPS outdoors)
 - A **user model** describes the knowledge, the interests, the movement and the personal preferences of the user (user preferences stored,.. Psychology...)

Hippie

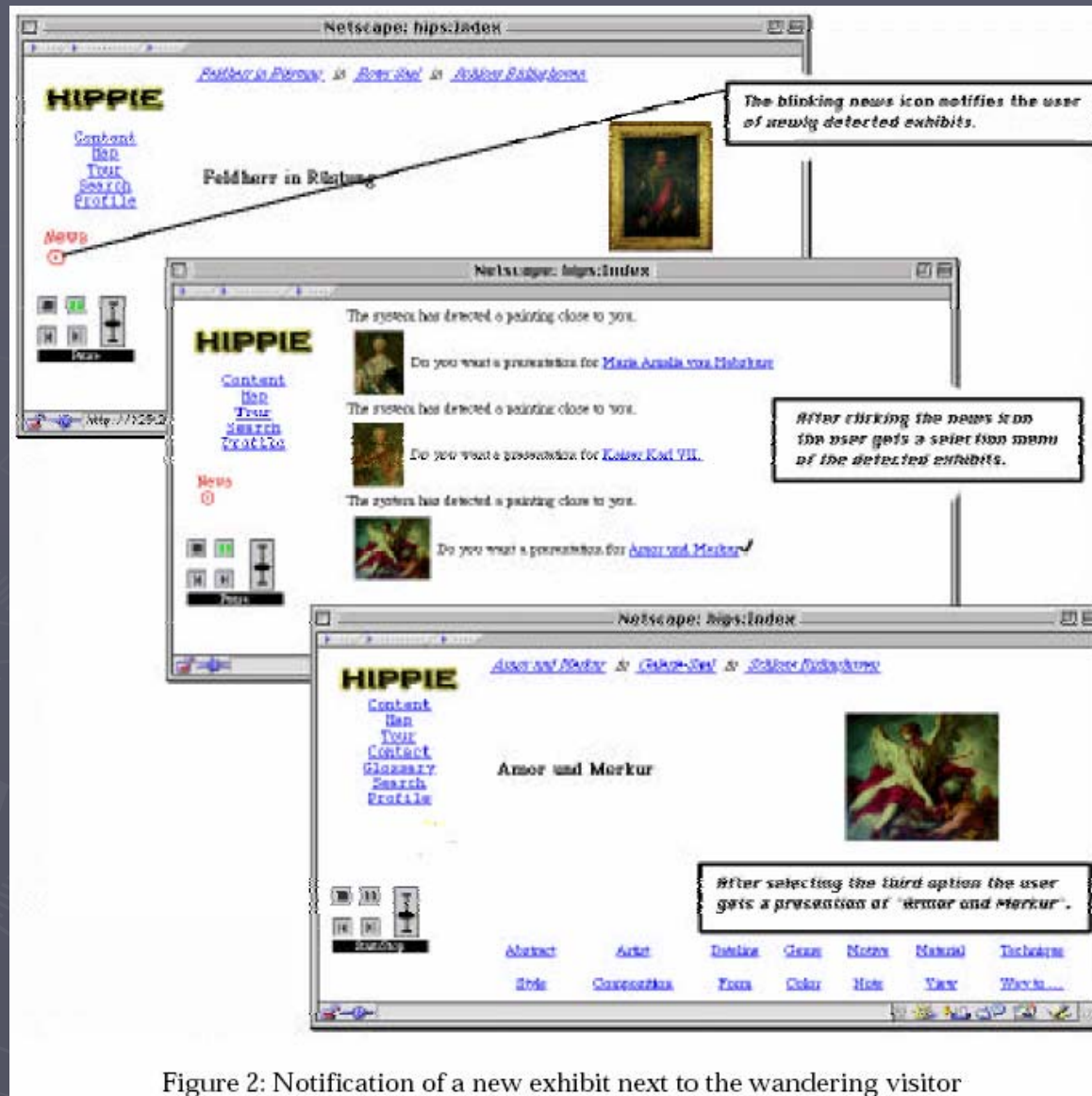



Figure 2: Notification of a new exhibit next to the wandering visitor

Hippie

Amor und Merkur: in Galerie-Saal in Schloss Birlingshoven

HIPPIE

[Content](#)
[Map](#)
[Tour](#)
[Search](#)
[Profile](#)



Amors Körper weist eine Bogenspannung auf. Arm und Körper selbst sind als Pfeil und Bogen gestaltet. Somit ist er vollkommen identifiziert mit dem bewegenden, hinweisenden Prinzip.

[Abstract](#) [Artist](#) [Dateline](#) [Genre](#) [Motive](#) [Material](#) [Technique](#)
[Style](#) [Composition](#) [Form](#) [Color](#) [Note](#) [View](#) [Way to ...](#)

Time: 9 | 64 | sec.
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Figure 3: Form design description by graphical teaching lines with written and spoken text