**Invalidity of U.S. Patent No. 6,748,317 by**
**The Cyberguide System ("Cyberguide") and Abowd, Gregory D., A Mobile Context-Aware Tou**
**Journals (September 23, 1996) ("Abowd")**

I have provided below a claim chart comparing the disclosures of Cyberguide and Abowd to the '317 Asserte combination of Cyberguide or Abowd and U.S. Patent No. 6,067,502 to Hayashida et al. ("Hayashida").

As described in my Report, the Cyberguide system was made publicly available at least as early as September 2 and functionalities of the Cyberguide system are described in the following printed publications:

- Abowd, Gregory D., A Mobile Context-Aware Tour Guide, Baltzer Journals (September 23, 1996 ("Abo
- Long, Sue, Cyberguide: Prototyping Context-Aware Mobile Applications, Future Compu https://www.cc.gatech.edu/fce/cyberguide/pubs/chi96-cyberguide.html ("Cyberguide Prototyping")
- CyBARguide Project Notes by Mike Pinkerton, Gregory Abowd, an https://www.cc.gatech.edu/fce/cyberguide/cybarguide/CyBARguide.html ("CyBARguide")

Because the Cyberguide product itself was known and used by others prior to the '317 Patent's priority date, i under 35 U.S.C. § 102(a) and (b)(pre-AIA). Additionally, because Abowd published on September 23, 19 constitutes prior art under 35 U.S.C. § 102(b) (pre-AIA).

Hayashida was filed on August 21, 1997 and issued on May 23, 2000. Hayashida therefore qualifies as prior art w patent under 35 U.S.C. § 102(e) (pre-AIA).

| U.S. Patent No. 6,748,317 | Cyberguide / Abowd |
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| *Claim 1* | |
| 1[P]. A portable terminal, comprising: | The Cyberguide is a portable terminal. For example, Abowd describes Cyberg on popular mobile devices at the time, such as the Apple MessagePad.<br><br>*Future computing environments will free the user from the constraint desktop. Applications for a mobile environment should take advan contextual information, such as position, to offer greater services to th In this paper, we present the Cyberguide project, in which we are b* |

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| | *prototypes of a mobile context-aware tour guide. Knowledge of the u current the location, as well as a history of past the location, as used to pr more of the kind of services that we come to expect from a real tour guide* ***describe the architecture and features of a variety of Cyberguide proto developed for indoor and outdoor use on a number of different hand platforms.*** *We also discuss the general research issues that have emerg our context-aware applications development in a mobile environment.*<br>*Abowd at* 1; *see also id.* at 2.<br><br>*We will describe in Section 5 the initial realization of the generic compo of the Cyberguide architecture,* ***a series of prototypes developed for the A MessagePad***<br>*Abowd* at 2-3.<br><br>*This section outlines some possible uses for future mobile context-a applications. Some of these uses are currently being implemented and som futuristic. We begin with our initial assumptions about what technolog expect Cyberguide to use. Tourists are usually quite happy to carry arou book that describes the location they are visiting, so a reasonable packa would be in the form of a hand-held device. The ideal hand-held device have a screen and pen/finger interface, access to substantial storage reso \|possibly through an internal device such as a CD drive, or through substa communication and networking resources (cell phone, pager, data interface) providing access to other storage servers (such as the Web)\| an a input and output interface with speech generation and potentially sophisti voice recognition, and a video input and output interface.*<br>*Abowd* at p. 3.<br><br>***One major application of mobile context-aware devices are personal gu Museums could provide these devices and allow users to take persona tours seeing any exhibits desired in any order, in contrast to today's t tours. In fact, many museums now provide portable devices for just su purpose,*** *but what we are envisioning is a device that would allow the to* |

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| | *to go anywhere she pleases and be able to receive information about anyw she is. Walking tours of cities or historical sites could be assisted by t electronic guidebooks. The hand-held devices could use position measure systems such as indoor beacons or the Global Positioning System (GP locate the user, and an electronic compass or inertial navigation system to user orientation.*<br>*Abowd at* 3. |
| [1(a)] a device for getting the location information denoting a resent[1] place of said portable terminal;[2] | Under the Court's construction of this limitation, Cyberguide discloses the fu location information denoting a present place of said portable terminal using compass, gyroscope, and/or sensor such as a clinometer in conjunction with a CP thereof. Cyberguide includes a device (i.e., the CPU of the Apple Message N Operating System, a GPS, and an IR-beacon system) that performs the claimed f the location information denoting a present place of said portable terminal. The p then depicted using a pointer symbol on a map.<br><br>***The hand-held devices could use position measurement systems suc indoor beacons or the Global Positioning System (GPS) to locate the*** *and an electronic compass or inertial navigation system to find orientation. Objects of interest could be marked with visual markers or a beacons or recognized using computer vision.*<br>*Id.* at 3.<br><br>*In thinking about and developing a location-aware application, we were gr influenced by work such as the PARCTab at XeroxPARC [14], the Info project at Berkeley [7], the Olivetti Active Badge system [14] and the Pers Shopping Assistant proposed at AT&T [3]. We wanted to build u* |

[1] Based on Plaintiff's Infringement Contentions and subsequent claim limitations referring to a present place, Defe this to mean "present."

[2] The Court construed this element as:

"**Function**: getting location information denoting a present place of said portable terminal

**Structure**: a compass, gyroscope, and/or sensor such as a clinometer in conjunction with a CPU, or equivalents the

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| | *applications that might take advantage of the hardware developed i*<br>*PARCTab and InfoPad projects. We did not want to build our own hardv*<br>*so we have a different focus from all of these projects.* ***There are a numb***<br>***commercially available and relatively inexpensive hand-held units that w***<br>***suffice for our purposes, such as the Apple MessagePad with the Ne***<br>***Operating System,a MagicCap machine or a pen-based palmtop/tablet***<br>*We chose to work initially with the Apple MessagePad 100 with Newton 1.*<br>*pen-based PCs running Windows for Pen Computing 1.0. Each platform*<br>*available for $ 150-500 with relatively powerful development environm*<br>*This low cost of hardware was critical to the success of Cyberguide beca*<br>*made it possible to put a number of units in the hands of many students, al*<br>*different ideas that they were allowed to investigate.*<br>*Abowd at* 3-4.<br><br>***5.4 Position Component***<br><br>***Position is the obvious starting point for a context-aware mobile device***<br>***considered several methods for sensing the user the location. Outd***<br>***continuous services, such as GPS, can be used. Indoors, however,***<br>***signals are weak or not available.***<br>*Abowd at* 8.<br><br>*One solution for an indoor positioning system was to use infrared (IR).*<br>*first positioning system was based on using TV remote control units as a*<br>*beacons, and using a special IR receiver tuned to the carrier frequen*<br>*40kHz) of those beacons (Figure 3). A microcontroller (Motorola 68*<br>*interfaced the IR receiver to the serial port of the Apple MessagePad*<br>*deployed an array of remote controls hanging from the ceiling (Figure 3 r*<br>*each remote control acting as a position beacon by repeatedly beaming*<br>*unique pattern. The 68332 translates the IR pattern into a unique cell iden*<br>*that is sent to the Apple MessagePad's serial port. As the tourist moves ar*<br>*the room and passes into the range of a new cell, the position (indicated*<br>*arrowhead) is updated on the map. Keeping track of the last recorded ce* |

*location provides a good guess as to the location the tourist is heading, s*
*indicate an assumed orientation by pointing the position icon accordingly*
*Abowd at* 9.

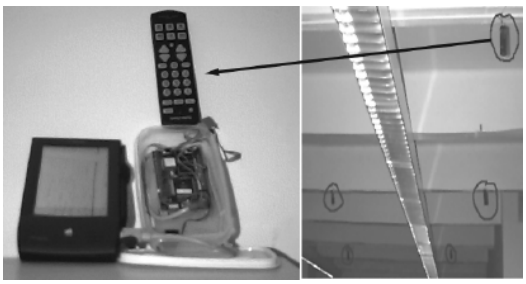

*Figure 3: IR positioning prototype (left) and the array of positioning bea*
*in the GVU Lab (right).*
Abowd at 9.

*8.5 Use of Vision*

*In the extreme case, we can think of a communion between the physica*
*electronic worlds, as suggested by work in augmented reality. Replac*
*hand-held unit with a pair of goggles and as the user wanders ar*
*information about certain exhibits can be summoned up and overlaid on t*
*the actual image. Vision techniques can be used to augment the positi*
*system to inform the system and tourist what the tourist is looking at. We*
*experimented with vision systems as an extension to Cyberguide. Ultima*
*we want to move to ward personalized vision systems.*

*8.6 Ubiquitous Positioning System*

*Our current prototypes are exclusively indoor or outdoor, not both. T*
*mainly because we had no one positioning system that worked in*
*conditions. GPS is unreliable indoors and the IR-based beacon syste*
*impractical for us to implement outdoors. We intend to integrate*

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