No. F05-HE-01	**Problem**

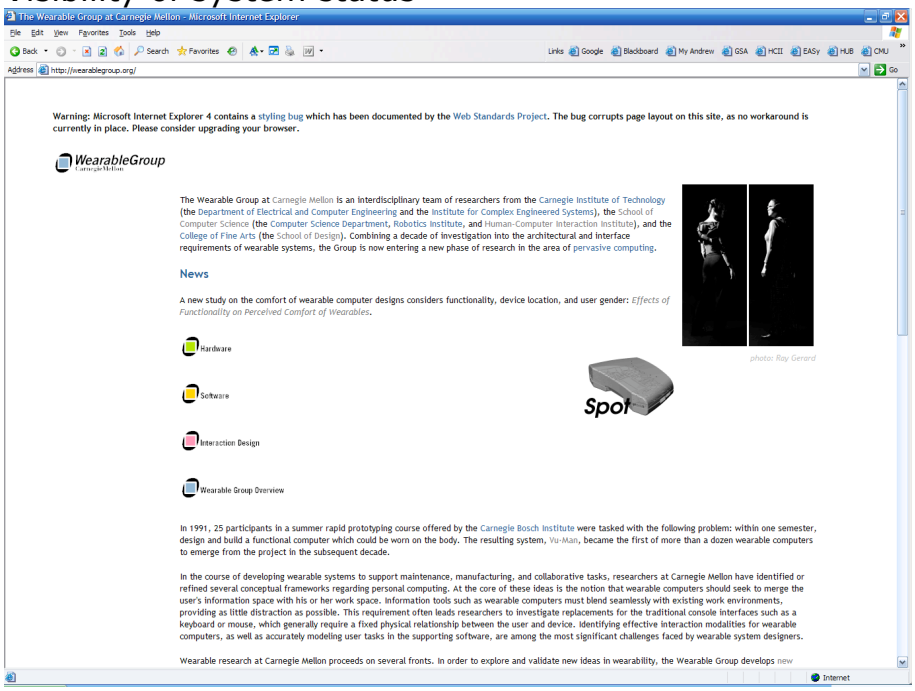
Name

Menu on main page isn't always "above the fold"

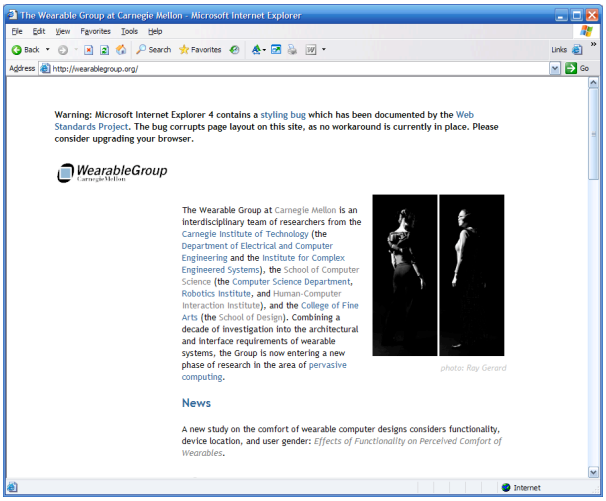
Evidence

Heuristic: Visibility of system status

Interface aspect:



This is what is visible on the main page with approximately 1350x890 used by the page.



This is what is visible on the main page with approximately 880x610 used by the page.

Explanation

Many laptops have lower resolutions so it is quite possible to be in the situation depicted by the second screenshot. The user would not be able to see any of the site menu. Additionally, since the site menu is typically always visible from the top of the page, this lack of visibility might make the user think there won't be a site menu. Without access to the site menu, there is no way for the user to navigate and explore the site, so they are likely to quickly leave.

Severity or Benefit

Rating:	3.33
Justification	
Frequency:	Moderate – There are lots of users with desktop machines that would not encounter this issue, but there are also many users with laptops, which typically have lower resolution screens. Additionally, many users do not use their browser at full size so they are likely to hit the issue as well.
Impact:	High – The user cannot navigate the site without the menu. There is indication that there is more content (scrollbar). But users are less patient on the web and may not bother exploring any further.
Persistence:	Low – Once a user discovers the site menu they are likely to remember it since it is conceptually simple. However, they will have to scroll the page to use the menu each time which would be annoying.
How I weighted the factors:	The most important aspect is the potential impact of losing a user. Since this site does not have thousands of hits a day, losing a new user is very significant.

Possible solution and/or trade-offs

The menu can be located on the edge of the screen, much closer to the top of the page, just below the logo.

No trade-offs are evident at this time.

Relationships

F05-HE-02 Menu is embedded in text on main page

No. F05-HE-02	**Problem**

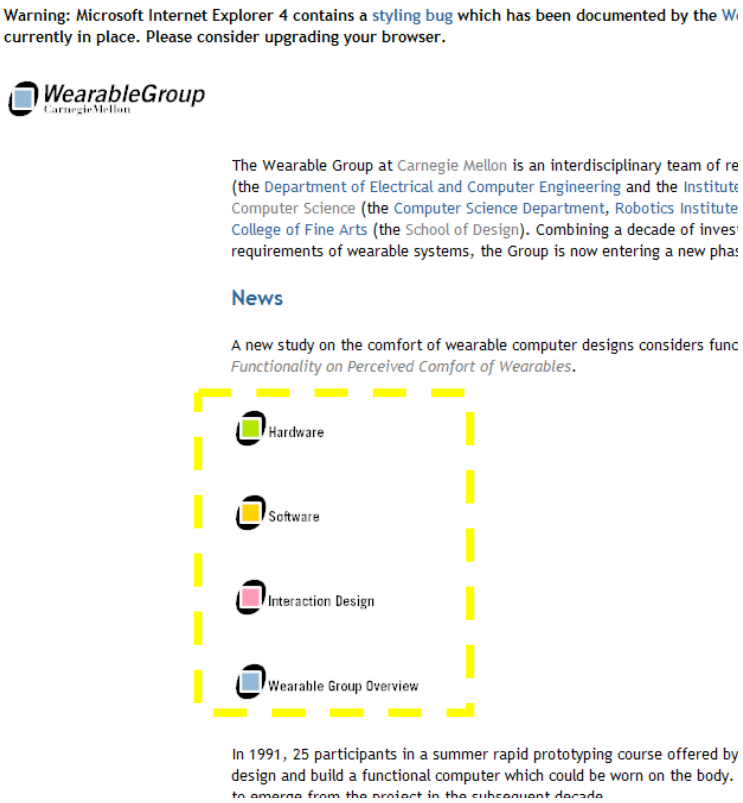
Name

Menu is embedded in text on main page

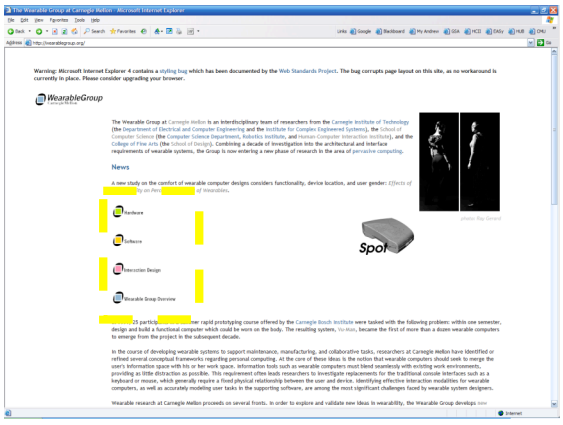
Evidence

Heuristic: Consistency and standards

Interface aspect:



The area outlined in yellow is the site menu.



This is a zoomed-out view of the main page.

Explanation

The site menu on the main page is embedded in between the news and a brief overview of the group. The site menu is typically in a visually well-defined region across the top of the page or down the left side of the page.

Severity or Benefit

Rating:	3
Justification	
Frequency:	High – Every user will encounter this as the site menu is the only way to navigate the site.
Impact:	Moderate – This will be somewhat disorienting for users since the convention for the location of the site menu is so strong.
Persistence:	Moderate – Even though the impact will be less for subsequent visits, other use of the Web will reinforce the convention so some impact will remain.
How I weighted the factors:	Despite the high frequency, the impact is not critical enough to warrant an extreme rating so it is only severe.

Possible solution and/or trade-offs

The menu can be located on the edge of the screen, much closer to the top of the page, just below the logo.

No trade-offs are evident at this time.

Relationships

F05-HE-01 Menu on main page isn't always "above the fold"

No. F05-HE-03	**Problem**

Name

Hard to find specific information

Evidence

Heuristic:	Flexibility and efficiency of use
Interface aspect:	There is only a basic menu structure that groups projects by a functional characteristic as hardware, software, or interaction design. Additionally, publications have no hierarchy or overview.

Explanation

If a user is looking for an answer to a specific question, the user will need to know the name and categorization of the project or the title of the paper, both of which are unlikely, to avoid having to browse through projects and papers arbitrarily to find it.

Severity or Benefit

Rating:	3
Justification	
Frequency:	High – One of the primary purposes of the site is informational so it is likely that many users will come seeking specific information.
Impact:	Moderate – Even though they may not know the specific name, they have probably heard it and would recognize it. There are only a few categories so it would not be difficult to browse them to see project names. Finally, an external search engine could be used to find the information.
Persistence:	Moderate – It would still be somewhat time consuming to track down information, but as the user gets more familiar with the site, the process will get quicker.
How I weighted the factors:	Experienced users will probably be able to overcome the issue without too much effort, but many less experienced users will probably experience the full impact. Since the impact could be task failure in some cases and significant increase in duration in most, the rating is severe.

Possible solution and/or trade-offs

Add search functionality to the site.

Possible trade-offs are that it is difficult to implement search well and it may be expensive to buy a third-party search infrastructure.

Relationships

None when the original UAR was written.

No. F05-HE-04	**Problem**

Name

Shrinking/warping of menu makes it hard to read

Evidence

Heuristic: Error prevention

Interface aspect:

Above is the site menu show at actual size and legibility.

Explanation

The site menu on most pages is difficult to read. (It appears to be made by shrinking the same images from the main page.) Users may have to just try the links to determine if it is what they want.

Severity or Benefit

Rating: 2.67

Justification

Frequency:	High – This menu is used on almost every page but the main one so virtually every user will encounter it.
Impact:	Moderate – There are few links and it is easy to back up so there is little cost in having to explore, though users of the Web are not typically very patient.
Persistence:	Low – Because the menu occurs so frequently, users are likely to quickly learn where each link goes and not have to read the labels.
How I weighted the factors:	With such a high frequency, the rating could be very severe. The low persistence reduces it so it is not quite severe.

Possible solution and/or trade-offs Use a font at the desired size to create the menu instead of using a bitmap program to scale down a larger font. No trade-offs are evident at this time.
Relationships None when the original UAR was written.

No. F05-HE-05	**Problem**

Name

Project pages do not have consistent structure/layout

Evidence

Heuristic: Consistency and standards

Interface aspect:

Spot

New! Images of Spot R3. *(updated 26 September, 2002)*

New! Spot R3 informational one-page handout.

The Wearable Group at Carnegie Mellon University has completed two design cycles for a new research computer named Spot, and is now proceeding with the creation of a third-generation system. Developed as a platform for the exploration of interaction design, mobile ad-hoc wireless networking, and power-aware computing, Spot provides workstation-class processing, storage, and connectivity in a wearable form factor. Spot R3a will be manufactured and tested during Fall 2002, after which time production units will be made available for purchase.

As wearable and mobile computing enter the mainstream of discussion in the areas of system architecture and human-computer interaction, researchers increasingly require flexible tools with which to evaluate new ideas. For interaction designers, this may imply the ability to rapidly prototype new interface modalities - both in software and hardware - and perform user trials against well-understood applications or tasks. For the network protocol designer, this may require a truly mobile computer which can communicate while on the go, and which can sense relevant environmental characteristics such as physical position or network conditions. For the power-aware system architect, the requirements certainly include low-power design, but may also include the ability to sense the power consumption of each individual subsystem within the machine. Spot was designed to address all of these needs.

Spot inherits from more than a dozen generations of wearable computers developed by the Wearable Group. Based on a decade of research surrounding the interaction and architectural requirements of wearable systems, the Spot design focuses on those requirements seen as necessary for the continuation of this work. For example, experience with recent commercial systems has revealed a lack of straightforward extensibility. Spot includes two hot-swappable card slots, a Universal Serial Bus master, and dual IEEE-1394 ports. Field trials with previous wearables, both research and commercial, have indicated a need for hot-swappable display technologies. Spot uses the low-power Digital Visual Interface to allow on-the-fly exchange of head-mounted displays, touchscreens, or other graphical interfaces. Efforts to deploy high-performance speech recognition engines on earlier wearables were hindered due to memory hierarchy and storage limitations; the large core image size of the needed software can cause thrashing on smaller machines, and the various data sets can total hundreds of Megabytes on secondary store. Spot addresses this with 512 Megabytes of (up to) 100MHz SDRAM, 64 Megabytes of flash RAM, and an externally accessible CompactFlash slot, which can support storage devices such as the 1GB IBM Microdrive. Of course, a wearable design must truly be wearable, so Spot obeys the constraints determined by the Design for Wearability study performed by the Interaction Design Studio at Carnegie Mellon.

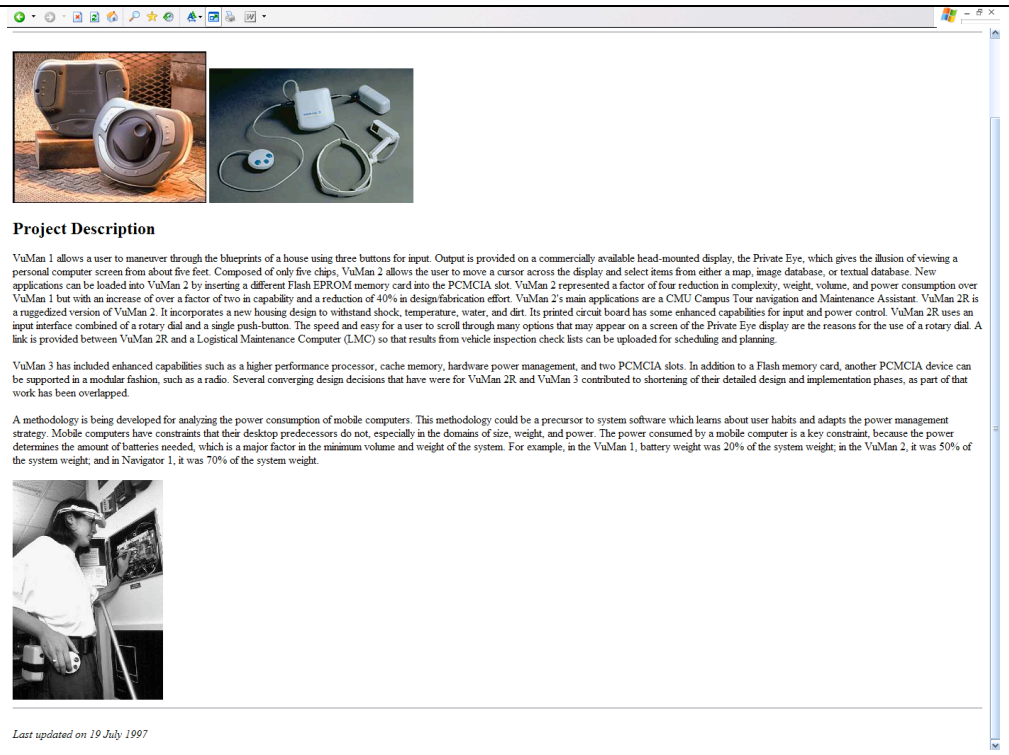
Beyond simply refining the lessons learned from previous systems, Spot also includes new design elements which will be of note to researchers. First, Spot includes fourteen analog-to-digital current sensors which monitor the energy dissipation of various components on board. The processor, card slots, and audio codec are among the many resources whose RMS current draw can be sampled in real time by the host processor. This information can be used in profiling, on-line resource scheduling, and trace-driven simulation, among other areas. By providing power data at this increased level of granularity over simply measuring at the system supply tap, researchers gain access to more useful insights about design decisions such as compute/communicate tradeoffs or fidelity scaling. Another area in which Spot supports wearable research is in the power distribution model, which is customizable. The Spot Core module, for volume and mass reasons, does not include an internal power supply. Instead, power is provided via the IEEE-1394 interface or through "smart" battery connectors which provide SMBus communication with on-battery charge monitors. With this design, researchers can choose to add a larger-capacity power supply to extend the usage lifetime of the system, or to power devices such as IEEE-1394 digital video cameras. Finally, Spot includes an adjustable-voltage power supply for the SA-1110 core, which allows software to more precisely tune the system power consumption to match application performance needs.

To simplify the development of application and driver software for Spot, the Linux operating system will be deployed on this hardware. Linux has previously been ported to the Intel StrongARM SA-1110 development board by the Wearable Group. The ARM architecture port of the Linux kernel is currently at version parity with the main tree, at version 2.5. ARM users have access to current versions of the GNU toolchain, including glibc.

The Wearable Group has partnered with the Pittsburgh Digital Greenhouse and Pittsburgh-based firms Inmedius, Inc., Abbra Design, Inc., and Engineering Graphics, Inc. to develop the Spot computer. Spot R3a is presently targeted for availability in Fall 2002.

Device	Spot Core Module (design revision R3/R3a, Fall 2001)
Microprocessor	Intel StrongARM SA-1110 @ 59-206MHz
Companion Chip	Intel StrongARM SA-1111 @ 144MHz

Above is part of the SPOT page, with a description and then some technical specs. There are some announcements at the top.



Project Description

VuMan 1 allows a user to maneuver through the blueprints of a house using three buttons for input. Output is provided on a commercially available head-mounted display, the Private Eye, which gives the illusion of viewing a personal computer screen from about five feet. Composed of only five chips, VuMan 2 allows the user to move a cursor across the display and select items from either a map, image database, or textual database. New applications can be loaded into VuMan 2 by inserting a different Flash EPROM memory card into the PCMCIA slot. VuMan 2 represented a factor of four reduction in complexity, weight, volume, and power consumption over VuMan 1 but with an increase of over a factor of two in capability and a reduction of 40% in design/fabrication effort. VuMan 2's main applications are a CMU Campus Tour navigation and Maintenance Assistant. VuMan 2R is a ruggedized version of VuMan 2. It incorporates a new housing design to withstand shock, temperature, water, and dirt. Its printed circuit board has some enhanced capabilities for input and power control. VuMan 2R uses an input interface combined of a rotary dial and a single push-button. The speed and easy for a user to scroll through many options that may appear on a screen of the Private Eye display are the reasons for the use of a rotary dial. A link is provided between VuMan 2R and a Logistical Maintenance Computer (LMC) so that results from vehicle inspection check lists can be uploaded for scheduling and planning.

VuMan 3 has included enhanced capabilities such as a higher performance processor, cache memory, hardware power management, and two PCMCIA slots. In addition to a Flash memory card, another PCMCIA device can be supported in a modular fashion, such as a radio. Several converging design decisions that have were for VuMan 2R and VuMan 3 contributed to shortening of their detailed design and implementation phases, as part of that work has been overlapped.

A methodology is being developed for analyzing the power consumption of mobile computers. This methodology could be a precursor to system software which learns about user habits and adapts the power management strategy. Mobile computers have constraints that their desktop predecessors do not, especially in the domains of size, weight, and power. The power consumed by a mobile computer is a key constraint, because the power determines the amount of batteries needed, which is a major factor in the minimum volume and weight of the system. For example, in the VuMan 1, battery weight was 20% of the system weight; in the VuMan 2, it was 50% of the system weight; and in Navigator 1, it was 70% of the system weight.

Last updated on 19 July 1997

Above is the VuMan 1 project. This time the description is labeled. There are no announcements or technical specs.

Explanation

Users who are browsing may be disoriented since they won't know what information will be there or, if present, where. If a user has found information in one project, he would probably expect to find similar information for other projects.

Severity or Benefit

Rating: 2.67

Justification

Frequency:	High – Almost all projects are somehow different in their structure. The vast majority of the site's content is the projects so many users will encounter this.
Impact:	Low – The size of each project's contents are such that they can still be managed without a consistent structure.
Persistence:	Moderate – As users use the site they will grow more familiar with the content and will remember what content is where, so the lack of structural aids will not be as much of a hindrance.
How I weighted the factors:	The low impact mitigates the high frequency so the rating is not quite severe.

Possible solution and/or trade-offs

Provide a general overview of the project followed by information specific to hardware, software, interaction design, and applications.

It will be time consuming to analyze the projects' contents to determine a structure that is flexible enough to provide all information that is available but rigid enough to aid users.

Relationships

F05-HE-38 Many users may not be interested in tech specs

No. F05-HE-06	**Problem**

Name

Most pages use jargon without explaining it

Evidence

Heuristic: Interface aspect: Match between system and the real world

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Many acronyms and abbreviations are used.

bootldr

This page contains information about enhancements to the bootldr program developed by Compaq as part of the handhelds.org project. The bootldr program is perhaps most familiar to users of the Compaq iPAQ Pocket PC, as it is the recommended loader for Linux on that hardware. The patches available from this site extend bootldr to support Assabet and Spot, while introducing a number of new features such as support for YMODEM and the Journalling Flash File System.

Please note that all of the bootldr patches distributed from this site are covered under the GNU General Public License. If you incorporate code from these patches into your own project, you are obligated to follow the terms of the GPL with respect to the patch contents *only*; the Compaq code is covered by a separate license.

Obtaining the original CVS source

The patches below apply to the contents of the handhelds.org CVS repository on a particular date. In the notes for each patch is the specific date for which that patch was generated. To check out the correct version of the CVS tree, say, for 30 February, 2001:

```
cvs -d :pserver:anoncvs@cvs.handhelds.org:/cvs
login (password: anoncvs)
cvs -d :pserver:anoncvs@cvs.handhelds.org:/cvs
co -D 2001-2-30 bootldr
```

Above is the beginning of a very technical project description.

Explanation

Some of the projects are very technical and would be quite intimidating to people new to the field. Many acronyms like to further information, but that information is not necessarily concise or clear for novices. The intimidation they experience may induce them to leave the site.

Severity or Benefit

Rating:	2.67
Justification	
Frequency:	Moderate – While many users are researchers or students in the field who would have little, in any, issue, one of the purposes is to provide information to those interested in entering the field.
Impact:	High – For novices, it will likely take a fair amount of research to develop an understanding of many of the terms.
Persistence:	Low – Much of the information is related so once some is understood, it will get increasingly easy to understand further information.
How I weighted the factors:	Since many users will have some level of technical background (or passion to learn) the frequency reduces the effect of the impact so that the rating is not quite severe.

Possible solution and/or trade-offs

Provide tool tips or prominently displayed links to context sensitive help to explain terminology used in content.

A possible trade-off is the expense it would take to add explanations where needed since much content could benefit from it due to the technical nature of the field.

Relationships

F05-HE-07 Web site does not have any help

No. F05-HE-07	**Problem**

Name

Web site does not have any help

Evidence

Heuristic:	Help and documentation
Interface aspect:	No help is available from any of the pages on the web site. There is lots of technical information present in the site.

Explanation

There is little information to explain wearable computing to novices, something they are likely to want to know. Nor is there any information about how to use the web site.

Severity or Benefit

Rating:	2.33
Justification	
Frequency:	Moderate – Many users are students or researchers in the field that would not benefit from help. But there is also, probably, an increasing number of people becoming interested in the field and looking to learn more.
Impact:	Moderate – Many of the users will have some technical background and will be able to understand information without help, though only with effort. The web site is structured in a regular fashion so learning how to use it through exploration would not be difficult.
Persistence:	Low - Once some information is understood, the highly related nature of the information makes it likely that other things will be understood with little extra effort from that point on.
How I weighted the factors:	Due to low persistence and the likelihood that most users will have a background that reduces the impact, the rating is minor.

Possible solution and/or trade-offs

Add a section to the web site that gives a brief overview of the field and the web site.

A possible trade-off is that writing clear and concise overview for each could be difficult.

Relationships

F05-HE-06 Most pages use jargon without explaining it

No. F05-HE-08	**Problem**

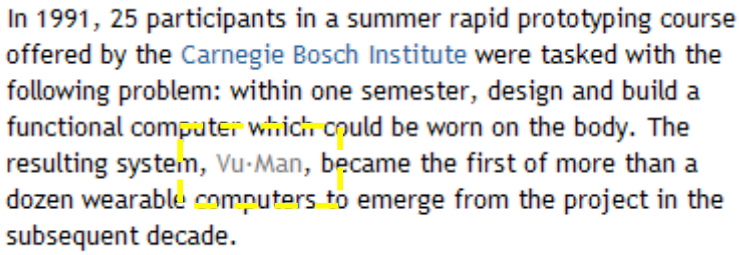
Name

The visited links look like regular text

Evidence

Heuristic: Recognition rather than recall

Interface aspect:


In 1991, 25 participants in a summer rapid prototyping course offered by the Carnegie Bosch Institute were tasked with the following problem: within one semester, design and build a functional computer which could be worn on the body. The resulting system, Vu·Man, became the first of more than a dozen wearable computers to emerge from the project in the subsequent decade.

Outlined in yellow is a visited link.

Explanation

Visited links are only distinguished from regular text by being a lighter shade. This makes it hard to notice them at all, especially on LCD screens.

Severity or Benefit

Rating: 2.33

Justification

Frequency:	High – All of the links are presented this way. Users are likely to visit some so most, if not all, users will encounter this.
Impact:	Low – The links are not generally used for site navigation, for which other mechanisms exist. They provide contextual information. They will typically be needed when the user is reading, so their attention will be on the link, making it more likely to be noticed.
Persistence:	Moderate – Once the user is aware that visited links are hard to discern, they will devote extra effort, making it slightly easier to notice them.
How I weighted the factors:	The low impact mitigates the frequency so the rating is minor.

Possible solution and/or trade-offs

Use underlines for all links that are embedded in regular text.

A possible trade-off is that when there are many links, the amount of underlining may be visually annoying.

Relationships

F05-HE-25 Links to other pages look like regular text

No. F05-HE-09	**Problem**

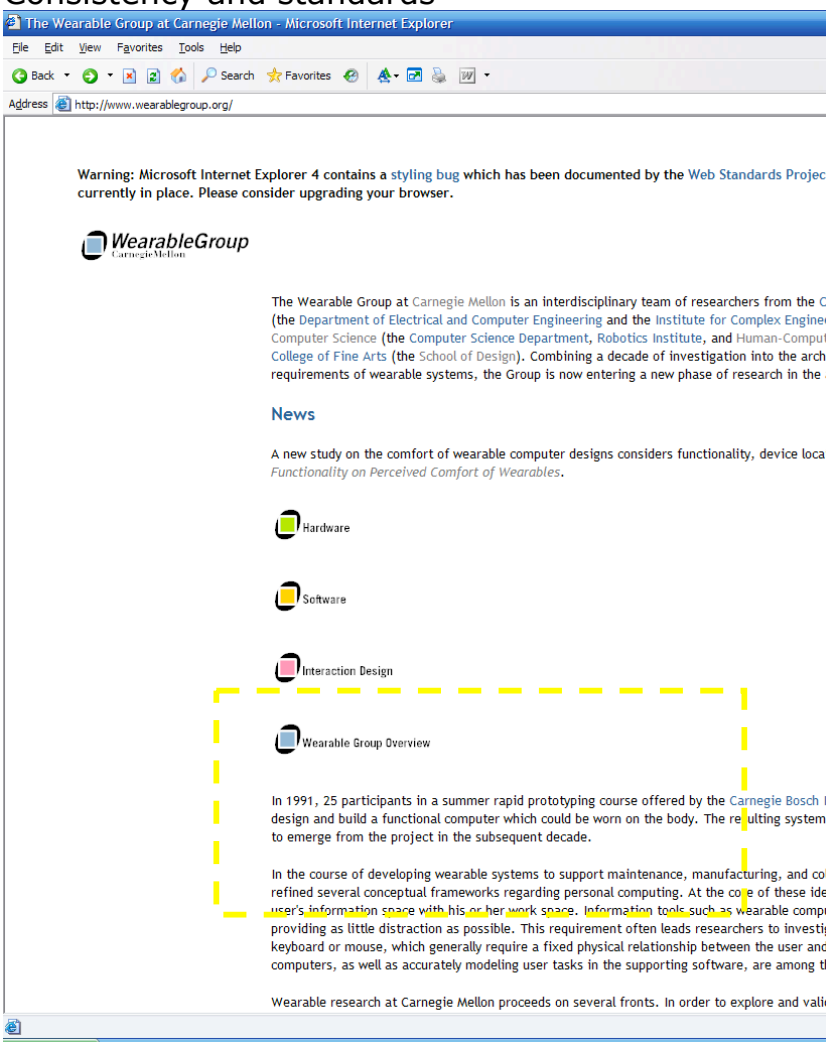
Name

The overview section has a menu entry but does not have its own page

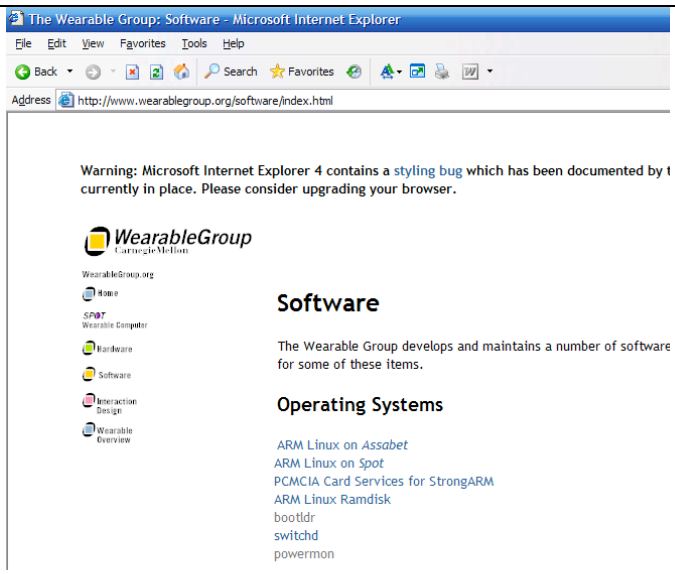
Evidence

Heuristic: Consistency and standards

Interface aspect:



The overview, outlined in yellow is in the middle of the main page.



Other sections, such as "Software", have their own page.

Explanation

Since the other sections all have their own page, the user may get confused when clicking on the link for the overview takes him to the middle of the main page.

Severity or Benefit

Rating:	2.33
Justification	
Frequency:	High – The overview section is likely to be used by many users due to its generalized nature.
Impact:	Low – Once they start reading, they will understand that they are at the overview and regain their bearings.
Persistence:	Low – Once they have visited the overview section once, they are likely to remember that it is different and not be confused.
How I weighted the factors:	Despite low impact and persistence, the rating is slightly higher than minor due to the high frequency, which is related to the importance of the overview section.

Possible solution and/or trade-offs

Move the overview section to its own page or put it at the top of the page so it feels like the primary content.

No trade-offs are evident at this time.

Relationships

None when the original UAR was written.

No. F05-HE-10	**Problem**

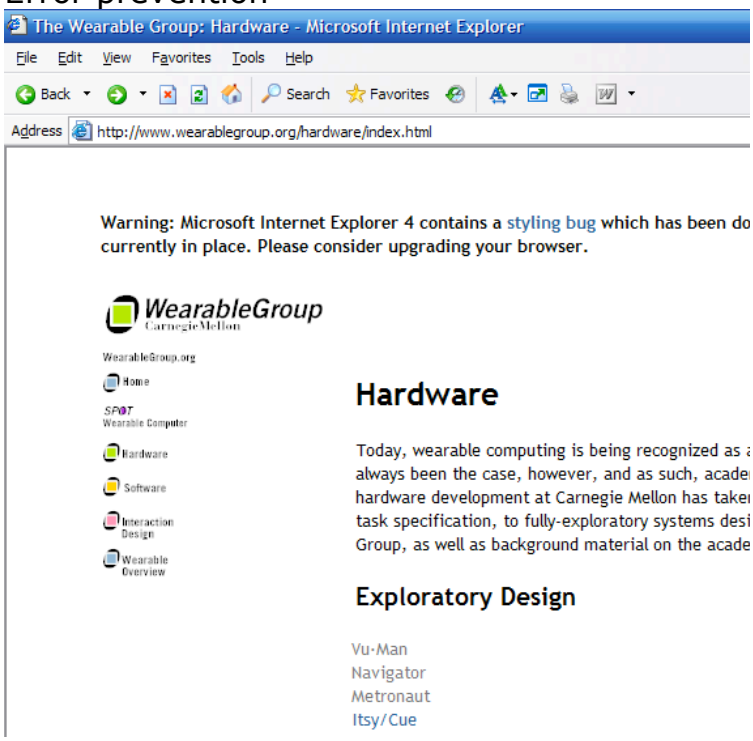
Name

Some project links go to content on other sites

Evidence

Heuristic: Error prevention

Interface aspect:



The first link under "Exploratory Design" takes the user to a page that redirects them to another site.

Explanation

When the content is on another site, there is no control over the content or if the site is even available.

Severity or Benefit

Rating: 2.33

Justification

Frequency:	Low – Many of the projects are hosted on other sites so many users will likely encounter projects that may have this issue. However, the other hosts are typically controlled by the same party as this site so the issue is unlikely to arise.
Impact:	High – There will not be any way to access the original content if it is changed. If it is unavailable, they can wait for the host to come back online, which could take days.
Persistence:	Moderate – The user may remember content they have seen previously, but waiting for the host to come back online will not necessarily be any quicker the next time.
How I weighted the factors:	Despite high impact, the frequency is very low since the same group typically controls the other servers so the rating is only slightly more than minor.

Possible solution and/or trade-offs Move all content to the web site. A possible trade-off is that due to the volume of non-local content, this could be expensive.
Relationships None when the original UAR was written.

No. F05-HE-11	**Problem**

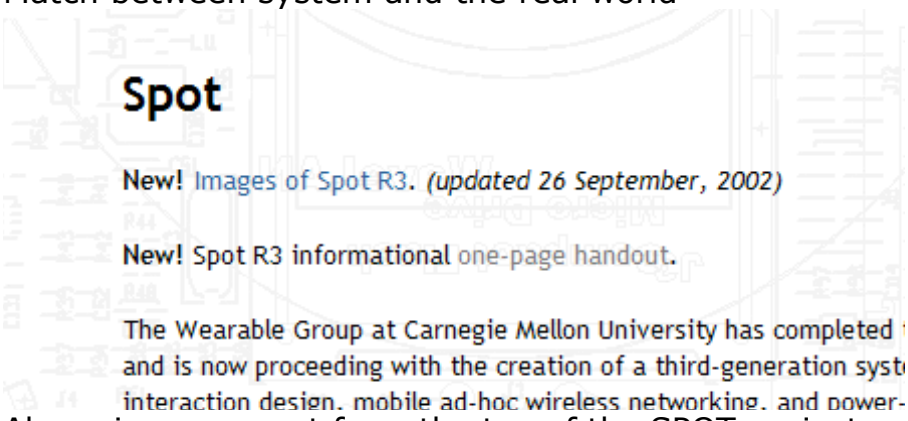
Name

Several year old info labeled as new

Evidence

Heuristic: Match between system and the real world

Interface aspect:



Above is an excerpt from the top of the SPOT project page.

Explanation

In most contexts, something that occurred several years ago is no considered new. Labeling several year old information as new makes users think the web site is hardly ever updated. This will cause users to be less likely to come back since they will not expect new content.

Severity or Benefit

Rating: 2.33

Justification

Frequency:	Moderate – This does occur on a project page, not the main page, but it is one of the more important projects. (It has its own link from the main page.)
Impact:	Low – Users will be able to ignore the "new" label.
Persistence:	Low – Once they realize that the content is not new, they should be able to remember it.
How I weighted the factors:	The extra factor of how this issue will affect users' future behavior raises the rating to slightly above minor.

Possible solution and/or trade-offs

Define a specific semantic to "new", e.g. content added in the last week or last month and ensure that the labeling is removed when the content reaches the appropriate age.

A possible trade-off is that it will probably require a complex and automatic infrastructure to completely ensure the semantic of "new" is enforced.

Relationships

None when the original UAR was written.

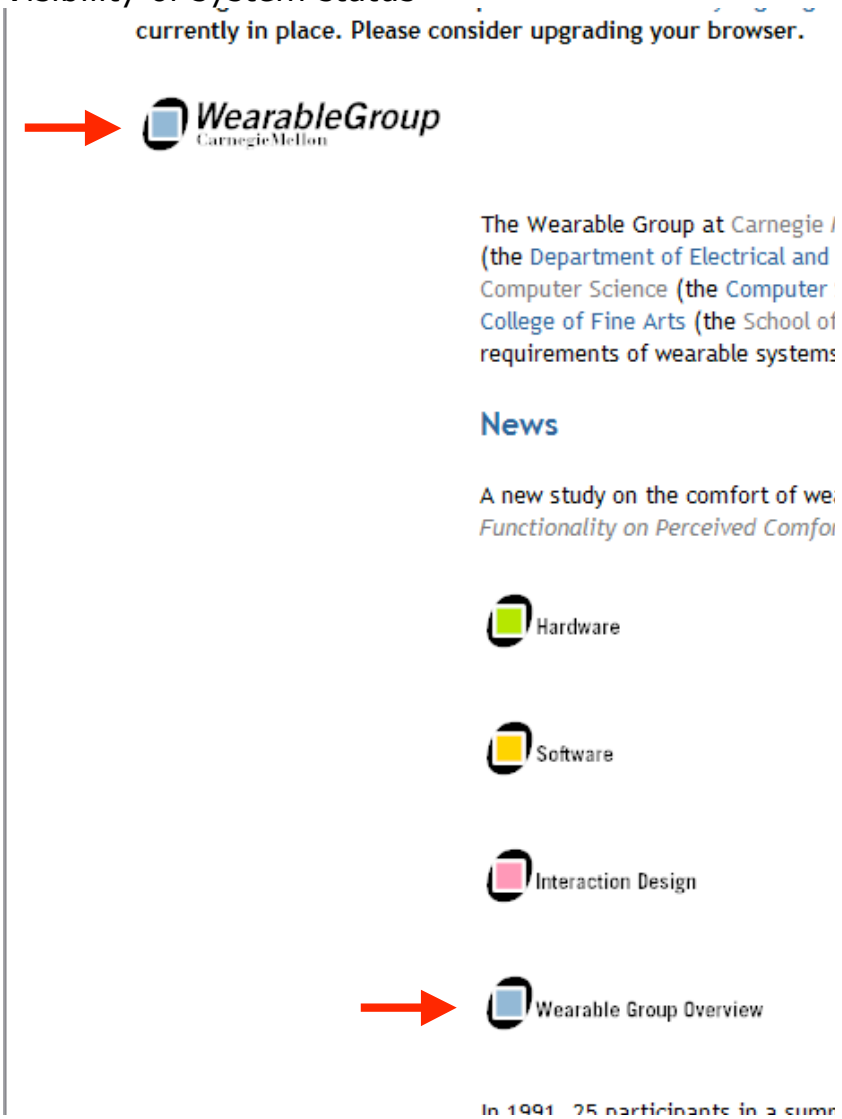
No. F05-HE-12	**Problem**

Name
Indication of site location by matching logo color is not noticeable

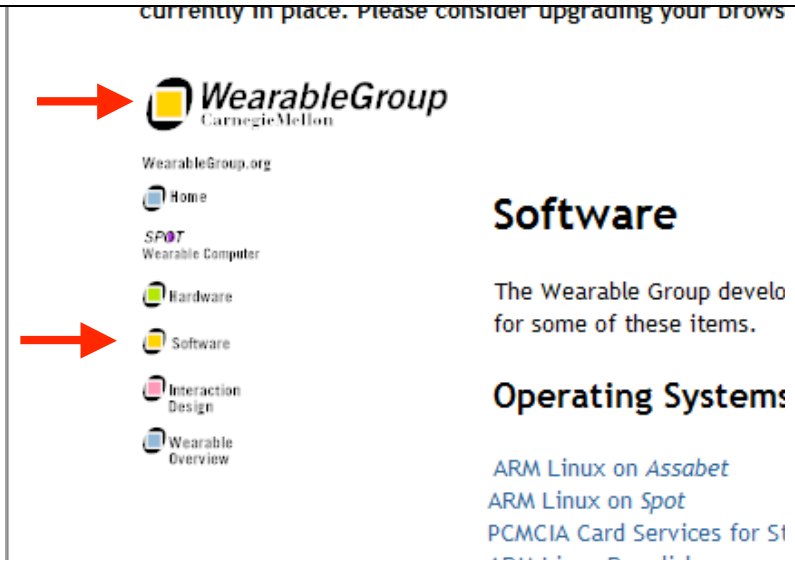
Evidence

Heuristic: Visibility of system status

Interface aspect:



Above is an excerpt from the main page. Red arrows have been added to highlight the color cue.



Above is an excerpt from the Software page. Red arrows have been added to highlight the color cue.

Explanation

The association between the logo and the user's location in the site is too subtle for the main page. This is due in part because the user may not think of the main page as the "Wearable Group Overview" since there is other content on that page. With this expectation set, the user is unlikely to notice it on the other pages. This aggravated by the fact that there is no inherent semantic relation between the colors and the site sections.

Severity or Benefit

Rating:	2.33
Justification	
Frequency:	High – Almost every user will see the main page. The logo is in the typical and a prominent location so many users will see that. All users will also see other parts of the site, probably not noticing the logo color change.
Impact:	Low – There are other cues to the location in the site, e.g. a textual label, so the user can determine location that way. Additionally, the site is not terribly complex with respect to the section organization so there are good odds that the user will simply be able to remember where they are.
Persistence:	Low - Once aware of the cue, the user will be unlikely to forget it.
How I weighted the factors:	The low impact and persistence compensate for the high frequency, resulting in a minor issue.

Possible solution and/or trade-offs

The logo could remain unchanged on each page. Location cues could be provided by directly indicating, e.g. with an arrow icon, the current section on the site menu.

No trade-offs are evident at this time.

Relationships
None when the original UAR was written.

No. F05-HE-13	**Problem**

Name

Can't find out summary of project without going to page

Evidence

Heuristic: Flexibility and efficiency of use

Interface aspect:

Above is an example from the Hardware page. Links under "Exploratory Design" are for individual projects.

Explanation

There are many projects. A new visitor is unlikely to guess what a project is about from the name. A returning visitor is unlikely to remember which project is which if they have browsed many. They will have to search for what they want manually, which would be a time consuming process.

Severity or Benefit

Rating:	2.33
Justification	
Frequency:	Moderate – One of the purposes of the web site is to provide information to the community so there will be many new users.
Impact:	Moderate – There are many different projects, but there is some level of grouping so the user would likely not have to browse them all. Users can bookmark projects if they know they will be interested in it again.
Persistence:	Moderate – Even after finding the desired project, the user can still forget if they do not visit regularly.
How I weighted the factors:	No aspect is too severe so the issue is minor.

Possible solution and/or trade-offs

Add a brief summary to the projects page so that users can scan (or even search on the page) for what interests them.

A possible trade-off is that it will spread out the project links, increasing the time to navigate through the projects page to a project that is known.

Relationships

F05-HE-16	Project name is only cue to recognize which project is which on list page

No. F05-HE-14	**Problem**

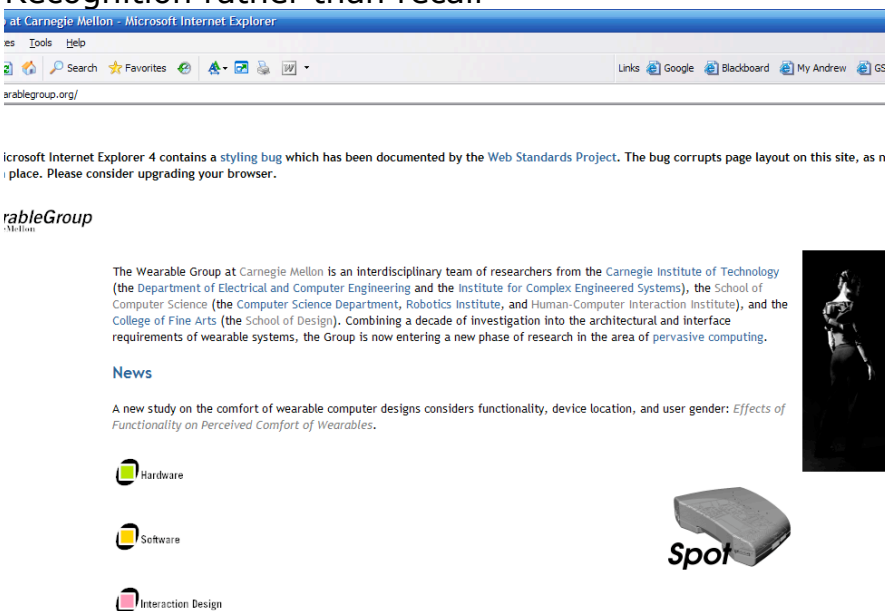
Name

Spot image on main page does not look like link

Evidence

Heuristic: Recognition rather than recall

Interface aspect:



The Spot image is in the lower left.

Explanation

The Spot image has no persistent visual cue that it is a link. Users may not realize it and be unable to take advantage of it as a shortcut to the Spot project page. (If they mouse-over it, the browser will probably indicate in a way that they will notice.)

Severity or Benefit

Rating: 2

Justification

Frequency:	High – Most users will not realize it is a link because it has no cues and it is not near the menu.
Impact:	Low – There is minor impact because there are other ways to quickly get to the Spot project page.
Persistence:	Low – Once the user is aware it is a link, they will probably remember.
How I weighted the factors:	The low impact and persistence mitigate the high frequency, resulting in a minor issue.

Possible solution and/or trade-offs

A possible solution is to place the image in the menu so users will expect it to have the properties of a menu item, e.g. be navigable.

A trade-off is that the image will need to be scaled down so it will be less detailed.

Relationships
None when the original UAR was written.

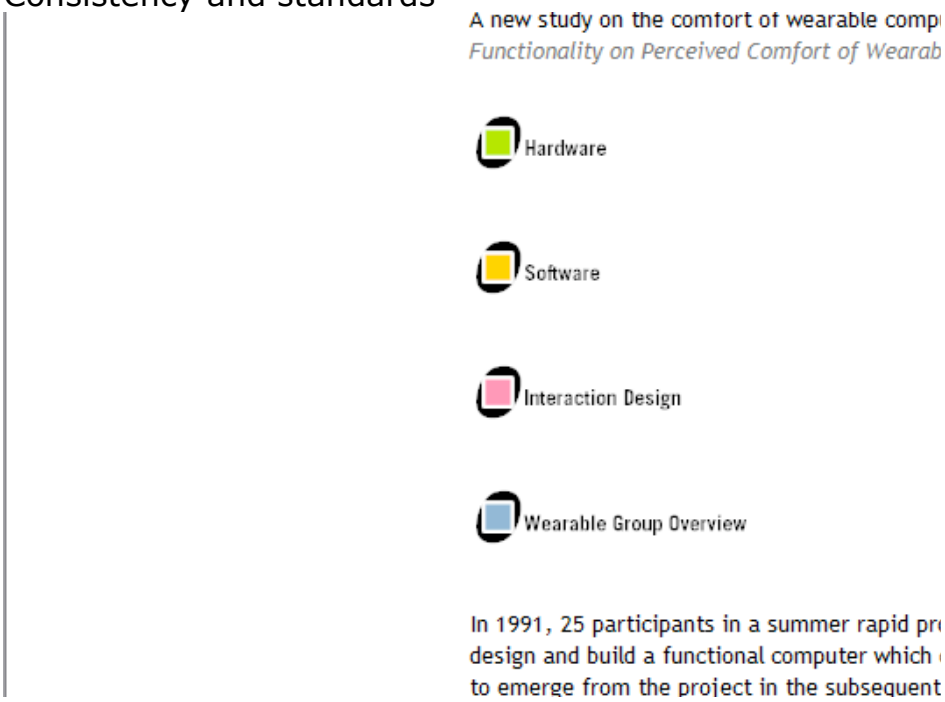
No. F05-HE-15	**Problem**

Name
Some sections linked by image, some by text

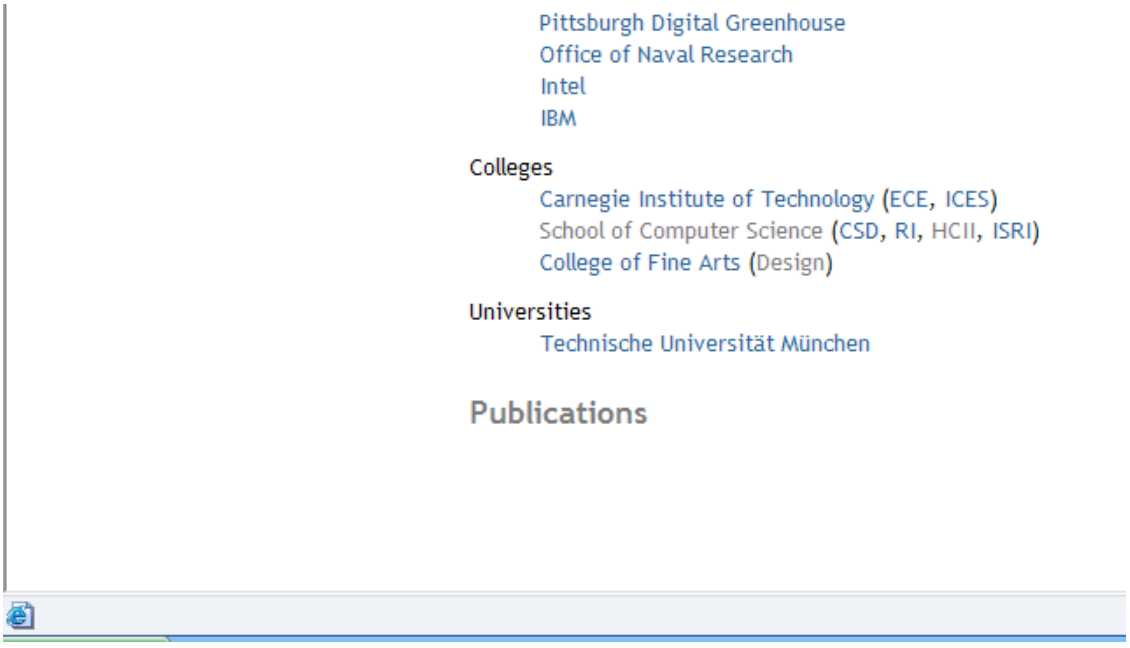
Evidence

Heuristic: Consistency and standards

Interface aspect:



Above several sections are accessed by image links.



Above the link to the Publications section is textual.

Explanation

Users may get confused about why some sections are linked by text and others by images. They will wonder what is different about the sections since the distinction was made.

Severity or Benefit

Rating:	2
Justification	
Frequency:	High – The links are needed to navigate the site so all users will notice them.
Impact:	Low – The user is unlikely to understand the distinction, but they will probably spend little effort in trying.
Persistence:	Low – Once understood or accepted, the user is unlikely to care again.
How I weighted the factors:	The low impact and persistence mitigate the high frequency.

Possible solution and/or trade-offs

Be consistent in the use of text or images for section links.

A possible trade-off is there might not be appropriate images for all sections and the absence of image links makes it harder to recognize a link since it is a rich visual cue.

Relationships

None when the original UAR was written.

No. F05-HE-16	**Problem**

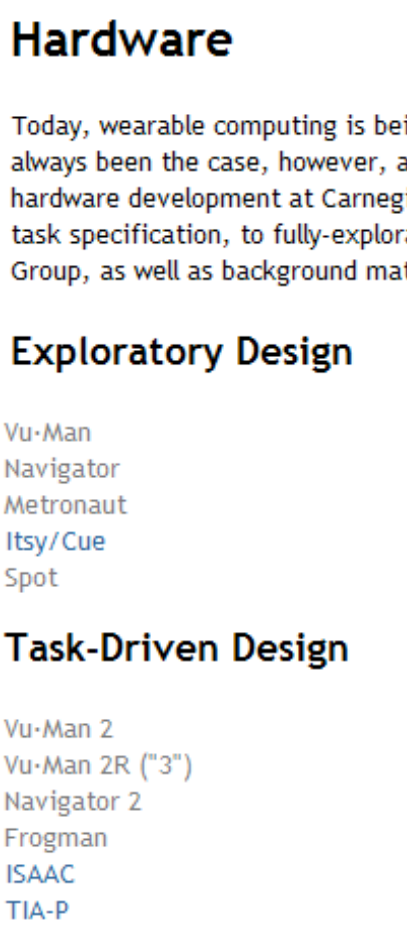
Name

Project name is only cue to recognize which project is which on list page

Evidence

Heuristic: Recognition rather than recall

Interface aspect:



Above is an example from the Hardware page. Links under "Exploratory Design" are for individual projects.

Explanation

While the names of the projects are generally quite distinct, they are not always that descriptive. They might not provide enough of a cue to someone who found a project they were interested after browsing through several when they come back a couple days later.

Severity or Benefit

Rating:	2
Justification	
Frequency:	Moderate – While many users will be repeat users who quickly become familiar with the projects, novices are a main audience for the web site. Novices are likely to browse several projects and want to find one in particular again later because they decided that is want most interested them.
Impact:	Moderate – There are many projects, but it would still be possible to browse through them again or use a search engine.
Persistence:	Moderate – Once the user finds they might lose track of projects, they can take notes or bookmark pages to make it easier to re-find projects.
How I weighted the factors:	All aspects are moderate so the issue is minor.

Possible solution and/or trade-offs

Add an image for each project so that users can form another association with the project.

A possible trade-off is that images made need to be made for some projects.

Relationships

F05-HE-13 Can't find out summary of project without going to page

No. F05-HE-17	**Problem**

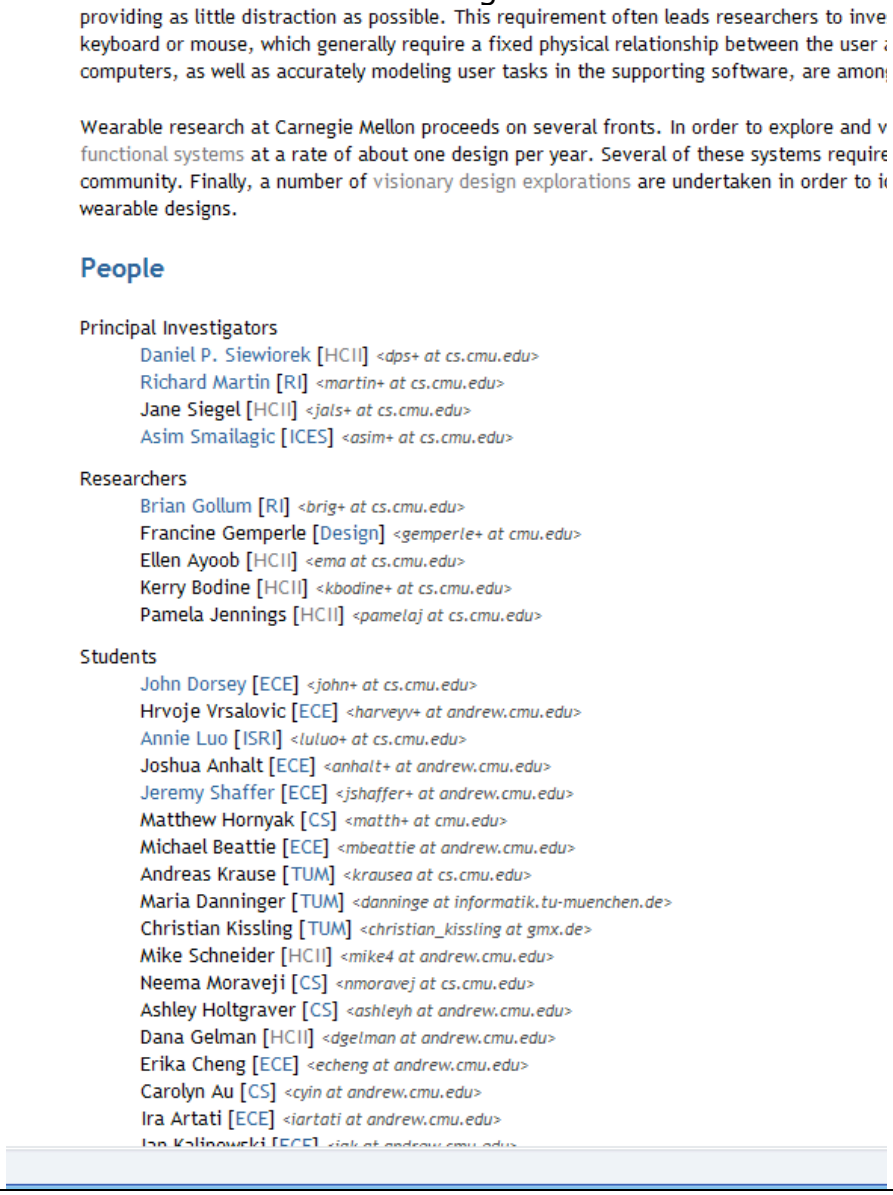
Name

People are on main page despite not primary focus of visitors

Evidence

Heuristic: Aesthetic and minimalist design

Interface aspect:



providing as little distraction as possible. This requirement often leads researchers to inve
keyboard or mouse, which generally require a fixed physical relationship between the user
computers, as well as accurately modeling user tasks in the supporting software, are amon

Wearable research at Carnegie Mellon proceeds on several fronts. In order to explore and v
functional systems at a rate of about one design per year. Several of these systems require
community. Finally, a number of visionary design explorations are undertaken in order to i
wearable designs.

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Explanation

The primary content on the site is the set of projects. The people are important but having them on the main page makes that less clear to visitors. Users might anticipate more content about the people being provided and become frustrated when they do not find it.

Severity or Benefit

Rating:	2
Justification	
Frequency:	Moderate – Basically every user will see the main page and notice the amount of space dedicated to people.
Impact:	Low – There is enough content dedicated to the projects that users will quickly determine the primary content of the site.
Persistence:	Low – With experience that the projects are the primary content, the user is unlikely to get confused.
How I weighted the factors:	All aspects are low to moderate so the issue is minor.

Possible solution and/or trade-offs

People can be moved to their own section, with a link from the site menu.

A possible trade-off is the making the people prominent increases the credibility of the site, which is a goal, so removing them would have the reverse effect.

Relationships

None when the original UAR was written.

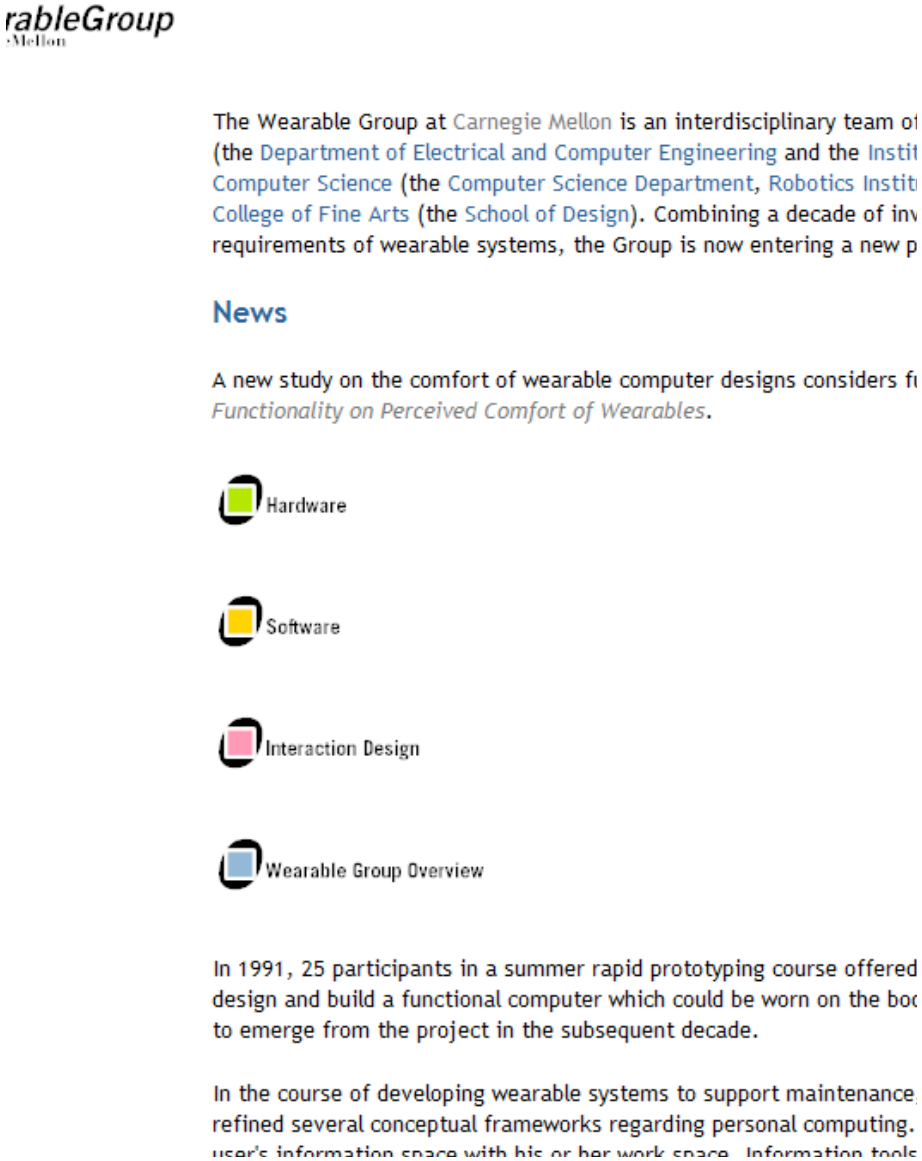
No. F05-HE-18	**Problem**

Name
Overview section is last in menu

Evidence

Heuristic:
Interface aspect:

Match between system and the real world



The last item in the menu pictured above is the overview.

Explanation
Users expect overviews to come first. After reading through several items in the menu and not finding it, their expectations may become so low that they don't even see it in the last position.

Severity or Benefit

Rating:	2
Justification	
Frequency:	Moderate – This menu is on the main page, which many users are likely to see. Additionally, overview is something that many new users, which is a target audience, will want to find.
Impact:	Moderate – Since the convention of overview first is so strong, it may take several visits before the user notices where it is.
Persistence:	Low – Once the user notices the overview, they are unlikely to forget since there are so few items.
How I weighted the factors:	With all moderate or low aspects, the issue is only minor.

Possible solution and/or trade-offs

The menu could be rearranged so that the overview is first.

A possible trade-off is that a section header would need to be created for the overview since the menu item appears to be serving a double purpose.

Relationships

None when the original UAR was written.

No. F05-HE-19	**Problem**

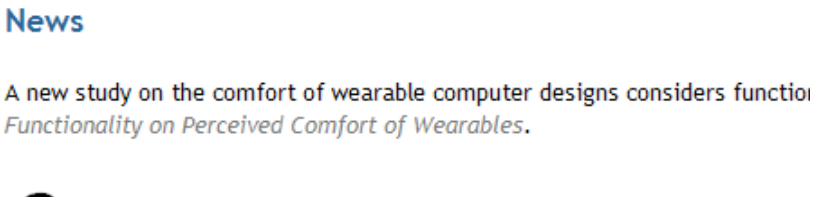
Name
Overview section does not have consistent heading

Evidence

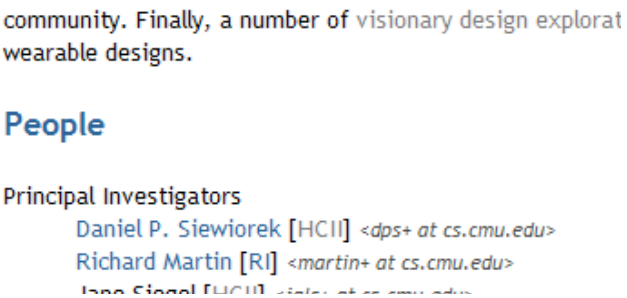
Heuristic: Consistency and standards

Interface aspect:

Above is the text of the overview. The image above that acts like the heading.



Above is the news section with a standard textual heading.



Above is the people section with a standard textual heading.

Explanation

Every section other than the overview has a conventional textual heading. The overview makes dual use of the menu item. Users will not expect the image to be the heading, as well, and will not understand that the section is the overview.

Severity or Benefit

Rating:	2
Justification	
Frequency:	High – The overview is towards the top of the main page so many users will notice it.
Impact:	Moderate – Users will need to read the content to determine what it is.
Persistence:	Low – Once users determine what it is, they are likely to associate it with the menu item. It will be unusual so they will likely not forget.
How I weighted the factors:	The moderate impact is the most significant factor since the low persistence offsets the high frequency so the issue is minor.

Possible solution and/or trade-offs

Use a conventional textual heading for the overview section.

No trade-offs are evident at this time.

Relationships

None when the original UAR was written.

No. F05-HE-20	**Problem**

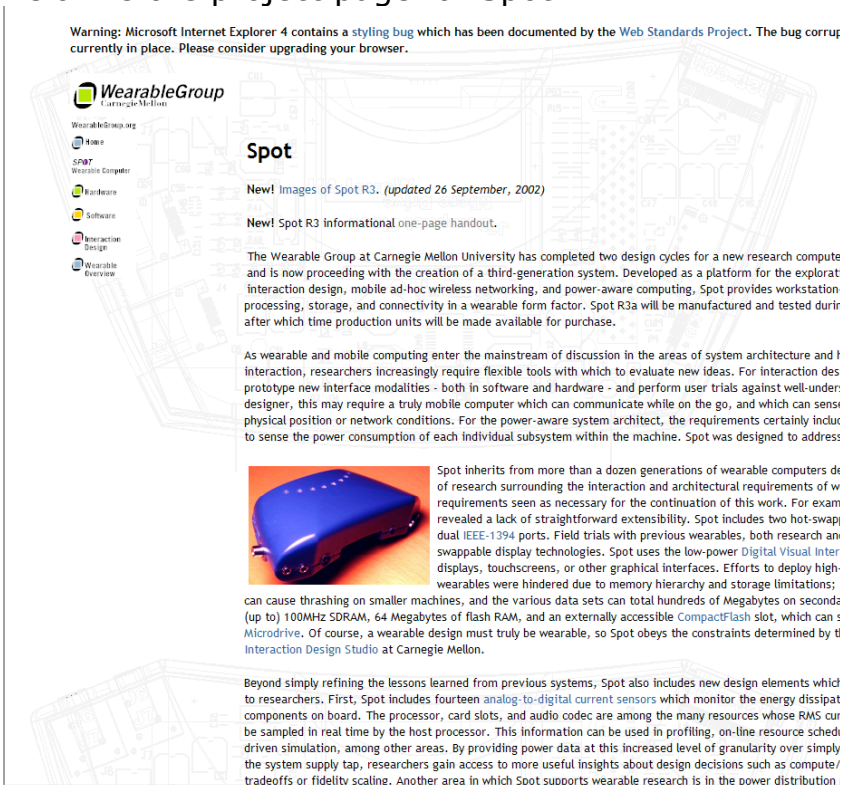
Name

No navigation aid present for very long pages

Evidence

Heuristic: Flexibility and efficiency of use

Interface aspect: Below is the project page for Spot.



Warning: Microsoft Internet Explorer 4 contains a styling bug which has been documented by the Web Standards Project. The bug corrup currently in place. Please consider upgrading your browser.

WearableGroup
Carnegie Mellon

WearableGroup.org
Home
SPOT Wearable Computer
Hardware
Software
Interaction Design
Wearable Overview

Spot

New! Images of Spot R3. *(updated 26 September, 2002)*

New! Spot R3 informational one-page handout.

The Wearable Group at Carnegie Mellon University has completed two design cycles for a new research compute and is now proceeding with the creation of a third-generation system. Developed as a platform for the explorat interaction design, mobile ad-hoc wireless networking, and power-aware computing, Spot provides workstation- processing, storage, and connectivity in a wearable form factor. Spot R3a will be manufactured and tested durir after which time production units will be made available for purchase.

As wearable and mobile computing enter the mainstream of discussion in the areas of system architecture and h interaction, researchers increasingly require flexible tools with which to evaluate new ideas. For interaction des prototype new interface modalities - both in software and hardware - and perform user trials against well-under designer, this may require a truly mobile computer which can communicate while on the go, and which can sens physical position or network conditions. For the power-aware system architect, the requirements certainly inclu to sense the power consumption of each individual subsystem within the machine. Spot was designed to address

Spot inherits from more than a dozen generations of wearable computers de of research surrounding the interaction and architectural requirements of w requirements seen as necessary for the continuation of this work. For exam revealed a lack of straightforward extensibility. Spot includes two hot-swap dual IEEE-1394 ports. Field trials with previous wearables, both research an swappable display technologies. Spot uses the low-power Digital Visual Inter displays, touchscreens, or other graphical interfaces. Efforts to deploy high- wearables were hindered due to memory hierarchy and storage limitations; can cause thrashing on smaller machines, and the various data sets can total hundreds of Megabytes on seconda (up to) 100MHz SDRAM, 64 Megabytes of flash RAM, and an externally accessible CompactFlash slot, which can s Microdrive. Of course, a wearable design must truly be wearable, so Spot obeys the constraints determined by t Interaction Design Studio at Carnegie Mellon.

Beyond simply refining the lessons learned from previous systems, Spot also includes new design elements whic to researchers. First, Spot includes fourteen analog-to-digital current sensors which monitor the energy dissipat components on board. The processor, card slots, and audio codec are among the many resources whose RMS cur be sampled in real time by the host processor. This information can be used in profiling, on-line resource sched driven simulation, among other areas. By providing power data at this increased level of granularity over simply the system supply tap, researchers gain access to more useful insights about design decisions such as compute/ tradeoffs or fidelity scaling. Another area in which Spot supports wearable research is in the power distribution

the system supply tap, researchers gain access to more useful insights about design decisions such as compute/ tradeoffs or fidelity scaling. Another area in which Spot supports wearable research is in the power distribution customizable. The Spot Core module, for volume and mass reasons, does not include an internal power supply. I is provided via the IEEE-1394 interface or through "smart" battery connectors which provide SMBus communicat design, researchers can choose to add a larger-capacity power supply to extend the usage lifetime of the system video cameras. Finally, Spot includes an adjustable-voltage power supply for the SA-1110 core, which allows sof consumption to match application performance needs.

To simplify the development of application and driver software for Spot, the hardware. Linux has previously been ported to the Intel StrongARM SA-1110 ARM architecture port of the Linux kernel is currently at version parity with access to current versions of the GNU toolchain, including glibc.

The Wearable Group has partnered with the Pittsburgh Digital Greenhouse a Design, Inc., and Engineering Graphics, Inc. to develop the Spot computer. 2002.

Device	Spot Core Module (design revision R3/R3a, Fall 2001)
Microprocessor	Intel StrongARM SA-1110 @ 59-206MHz
Companion Chip	Intel StrongARM SA-1111 @ 144MHz
Main Memory	8 x 256-Megabit Toshiba SDRAM (clocked at half processor PLL)
Non-volatile Memory	4 x 128-Megabit Intel StrataFlash
IEEE-1394	Texas Instruments Link-Layer controller, dual-port Physical-Layer transciever. Two 6-pi
Universal Serial Bus	SA-1111 Host Controller. One Type-A receptacle on board.
Digital Visual Interface	SiliconImage SiI-164 DVI transmitter. Custom compact connector with 5V power rail anc
Graphics Acceleration	MediaQ MQ200. 128-bit 2D acceleration with 2MB SDRAM, supports up to 1024 x 768 at
PCMCIA	One Type-II slot, internal. Custom diversity antenna board for Lucent WaveLAN (ORiNC
CompactFlash	One Type-II slot, externally accessible.
Audio	Philips UDA1341 via SA-1111 Serial Audio Controller. Two 3.5mm (1/8") stereo jacks fo
RS-232	Compact receptacle for SA-1110 UART3. (UART1 is collocated with DVI receptacle.) Aut
Batteries	Two hot-swappable 11.1Wh Li-ion cells, each with SMBus data lines and configurable di
A/D Converters	Eight dual-channel Crystal Semiconductor CS5460 power sensors.
Scalable Power	256-position programmable potentiometer with EEPROM adjusts SA-1110 core voltage.
Real-Time Clock	Battery backed-up real-time clock with SRAM.
Indicators	Eight bi-color LEDs.
Switches	Reset, one general-purpose momentary switch.
Development Port	JTAG header with 3.3V and ground references.
Size	6" x 3" x 1"
Weight	9.5 oz., not including batteries.
Power	460mA @ 12V (worst-case with max draw for IBM Microdrive and Lucent WaveLAN devices).

News

13 February, 2003
Spot is featured in the January issue of Microdisplay Report, which covers small, high-resolution ele used by the Wearable Group.

15 November, 2002
Spot is featured in the September/October issue of eDesign, an interactive media magazine.

4 September, 2002
Three new publications covering Spot: *Defect Distribution for Wearable System Design*, *Online Pow Wearable Systems: A Shift in Development Effort*.

20 October, 2000
Spot appears on Slashdot following ISWC 2000 in Atlanta.

PITTSBURGH DIGITAL GREENHOUSE
growing smart products

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ABBRA DESIGN, INC.

Explanation

The page is long with several distinct pieces, but there is not indication at the top of the page what they are nor are there aids to ease navigating to them directly. The user would have an easier time organizing their thoughts and extracting information with a clear hierarchy.

Severity or Benefit

Rating: 2

Justification

Frequency:	Moderate – Not all projects are long, but Spot is a more popular one so many users will encounter this.
Impact:	Low – Some of the pieces are labeled while others are reasonably evident as to their content so it is not difficult to overcome the informational deficit. Additionally, it is easy to simply scroll or "page down".
Persistence:	Moderate – While the user may remember the pieces for some projects, they will probably not be able to remember for many projects. Additionally, scrolling will not become any easier.
How I weighted the factors:	With moderate to low factors, the issue is only minor.

Possible solution and/or trade-offs

A table of contents could be added to the top of each project page.

No trade-off is evident at this time.

Relationships

None when the original UAR was written.

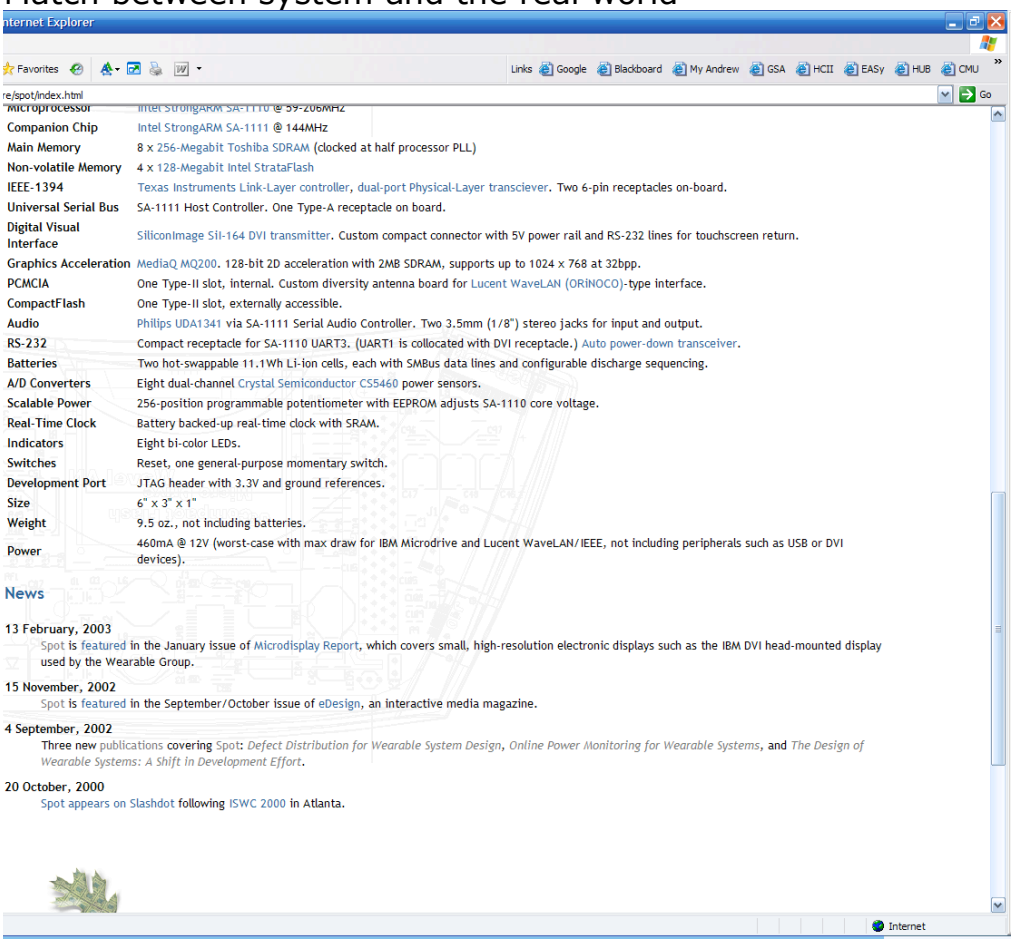
No. F05-HE-21	**Problem**

Name

News comes at end of SPOT page

Evidence

Heuristic: Interface aspect: Match between system and the real world



Above is the news section from the Spot page.

Explanation

News typically comes at the top since it is most likely to change and consequently users will expect that there is no news if it is not at the top. They might not look for it or not notice it when it is there.

Severity or Benefit

Rating:	2
Justification	
Frequency:	High – The Spot page is a popular project and the news convention is very common so many users will encounter this.
Impact:	Low – There isn't much other content so users are likely to still find the news if they are interested.
Persistence:	Low – Once known that there is news, users will most likely remember.
How I weighted the factors:	The low impact and persistence offset the high frequency so the issue is minor.

Possible solution and/or trade-offs

Move the news to the top.

No trade-offs are evident at this time.

Relationships

None when the original UAR was written.

No. F05-HE-22	**Problem**

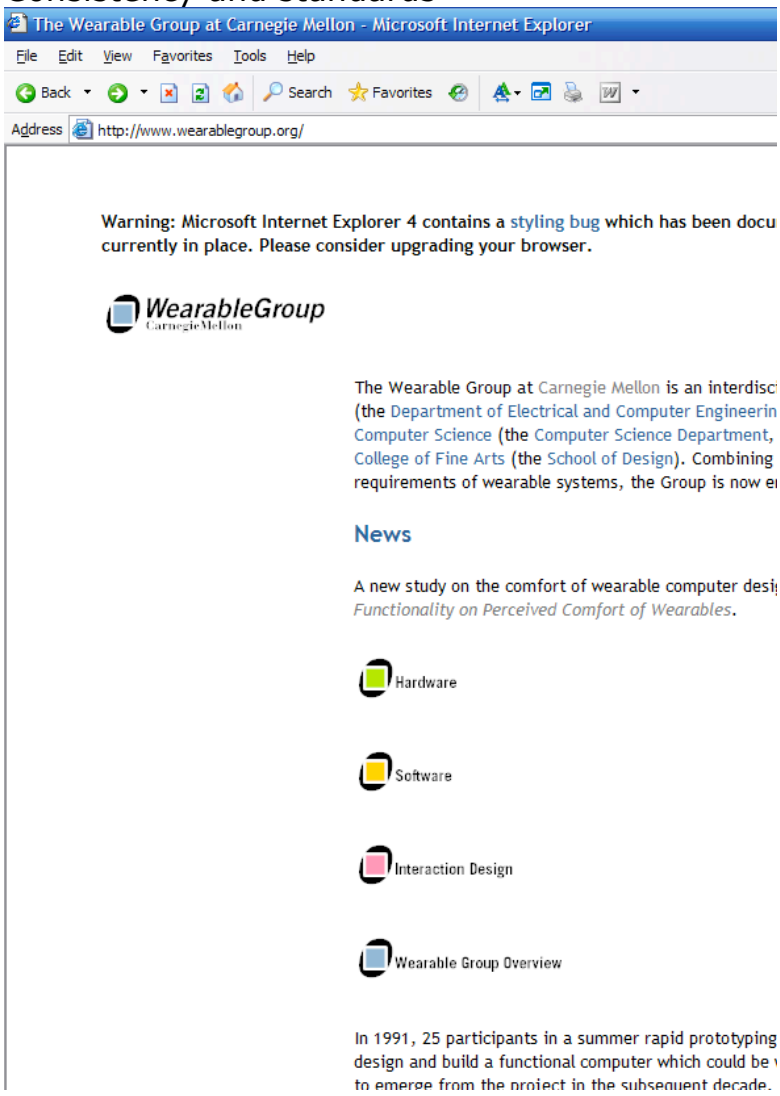
Name

Menu location inconsistent between main and other pages

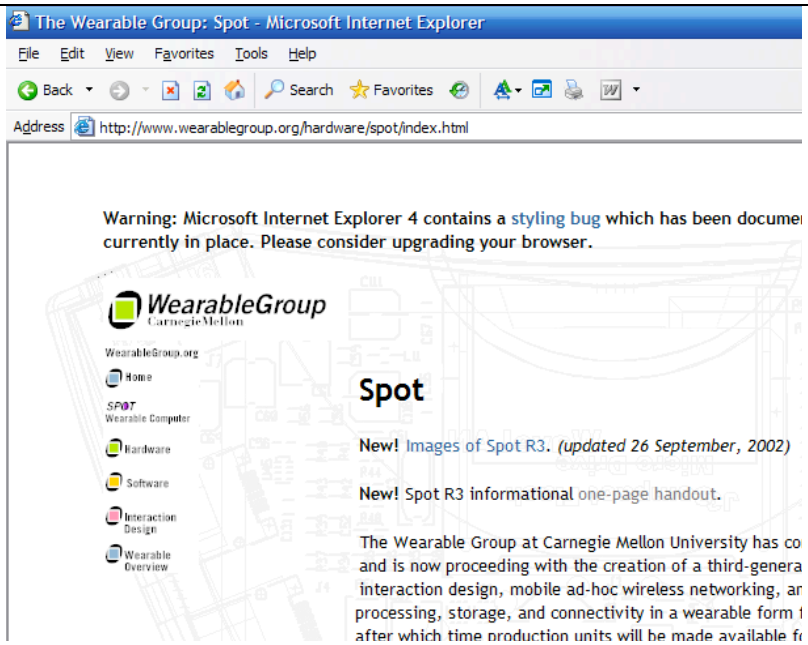
Evidence

Heuristic: Consistency and standards

Interface aspect:



Above is the menu from the main page.



Above is the menu for the Spot project page.

Explanation

Users might not realize that the menu on the main page is the menu and instead think it is just a collection of links. They will not come up with a fully accurate mental model of the site.

Severity or Benefit

Rating:	2
Justification	
Frequency:	High – Many users will see the main page and other pages.
Impact:	Low – Users will notice the menu on the main page because it is prominent. Users will notice the other menus because they are in a very common location. The menus look similar so users will likely make the connection.
Persistence:	Low – Once known that they are menus, the user will not forget since they are prominent and similar.
How I weighted the factors:	The low impact and persistence offset the high frequency so the issue is minor.

Possible solution and/or trade-offs

Use the same positioning for all menu instances.

No trade-offs are evident at this time.

Relationships

None when the original UAR was written.

No. F05-HE-23	**Problem**

Name
Menu items inconsistent between main and other pages

Evidence

Heuristic: Consistency and standards

Interface aspect: *Functionality on Perceived Comfort of Wea*

Above is the menu from the main page.

Above is the menu from the Software page.

Explanation
Spot has been added to the site menu on subordinate pages. Users may get disoriented by the adjustment to the menus.

Severity or Benefit

Rating:	2
Justification	
Frequency:	High – The menus are prominent and users are very likely to visit multiple pages, seeing the different instances of the menu.
Impact:	Low – There are few items in the menu so the users are likely to be able to learn and accommodate for the menu changing.
Persistence:	Low – Once the users are aware of the menu changes, they will likely remember since the menu is used so much.
How I weighted the factors:	The low impact and persistence offset the high frequency so the issue is minor.

Possible solution and/or trade-offs

Make the menu consistent on all pages by using the more complete version.

No trade-offs are evident at this time.

Relationships

None when the original UAR was written.

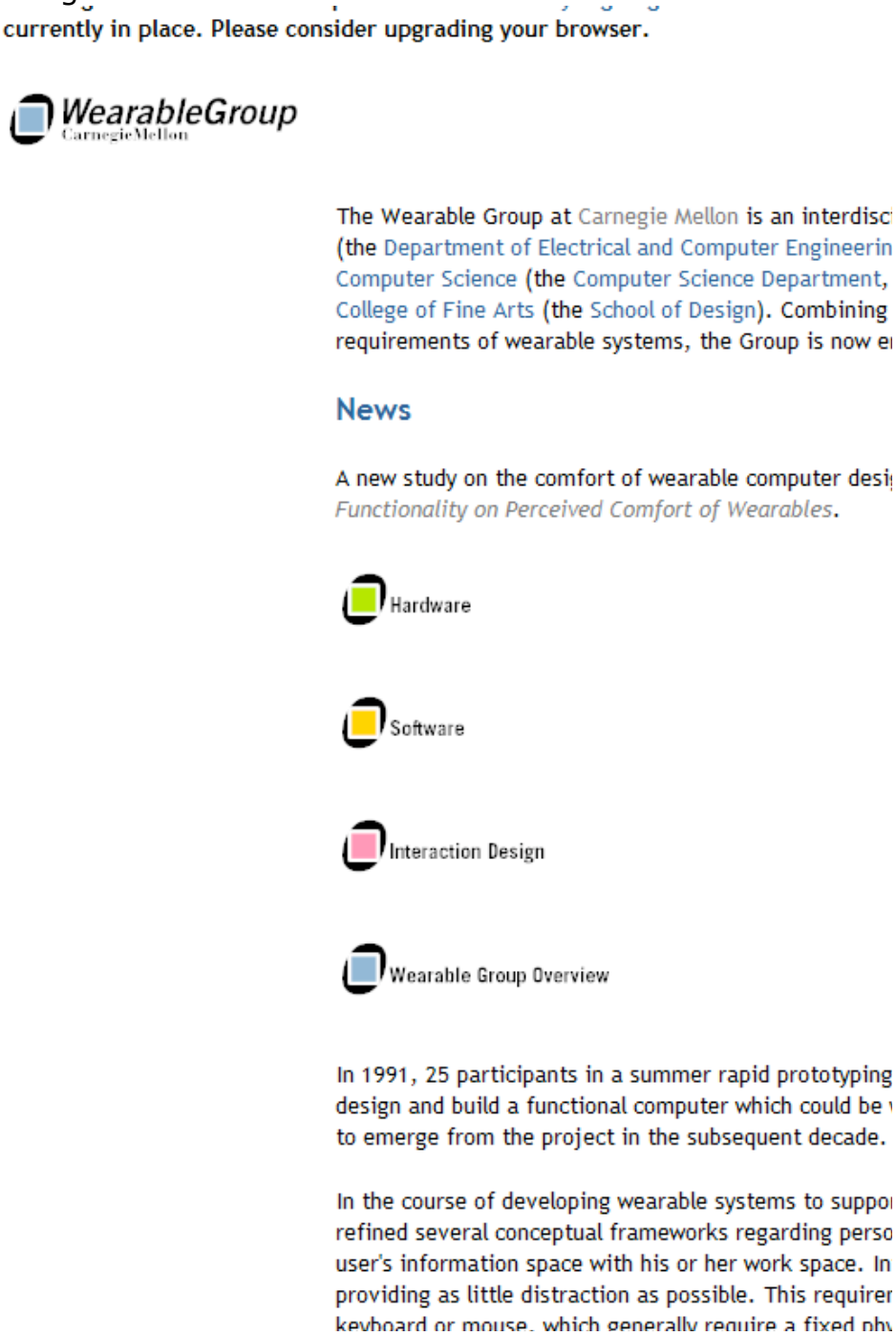
No. F05-HE-24	**Problem**

Name

Menu items do not look like links

Evidence

Heuristic: Interface aspect: Recognition rather than recall



Above is a picture of the menu on the main page.

Explanation

The images look like a bulleted list. Being embedded in textual content compounds this effect. The only cue is provided by the browser when the mouse pointer hovers over them. Users will have to explore to find these links.

Severity or Benefit

Rating:	2
Justification	
Frequency:	Moderate – Many users will not realize they are links for the aforementioned reasons. However, many users will assume they are since there are no other candidates for a menu.
Impact:	Moderate – Users will need to explore with the mouse or keyboard to determine they are links.
Persistence:	Low – Once known, users are unlikely to forget since the menu is commonly used.
How I weighted the factors:	With only moderate and low factors, the issue is minor.

Possible solution and/or trade-offs

Moving the images to a more conventional menu location and connecting the images together to strengthen the association should make it clear that they are actionable (i.e. links).

No trade-offs are evident at this time.

Relationships

None when the original UAR was written.

No. F05-HE-25	**Problem**

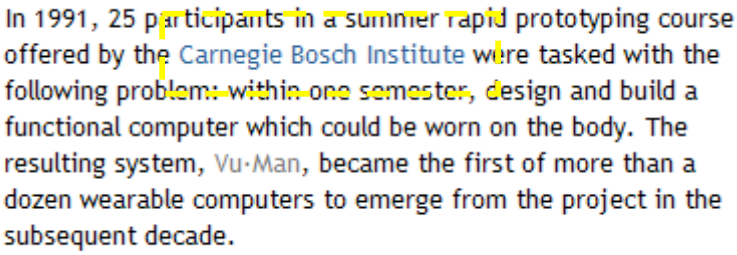
Name

Links to other pages look like regular text

Evidence

Heuristic: Recognition rather than recall

Interface aspect:



The text outlined in yellow is a link.

Explanation

Links are a different hue that regular text, but they are about as dark so there is not much distinction. Much information will be missed if links are not noticed.

Severity or Benefit

Rating: 2

Justification

Frequency:	High – All of the links are presented this way so most, if not all, users will encounter this.
Impact:	Low – The links are not generally used for site navigation, for which other mechanisms exist. They provide contextual information. They will typically be needed when the user is reading, so their attention will be on the link, making it more likely to be noticed.
Persistence:	Moderate – Once the user is aware that links are hard to discern, they will devote extra effort, making it slightly easier to notice them.
How I weighted the factors:	The low impact mitigates the frequency so the rating is minor.

Possible solution and/or trade-offs

Use underlines for all links that are embedded in regular text.

A possible trade-off is that when there are many links, the amount of underlining may be visually annoying.

Relationships

F05-HE-08 The visited links look like regular text

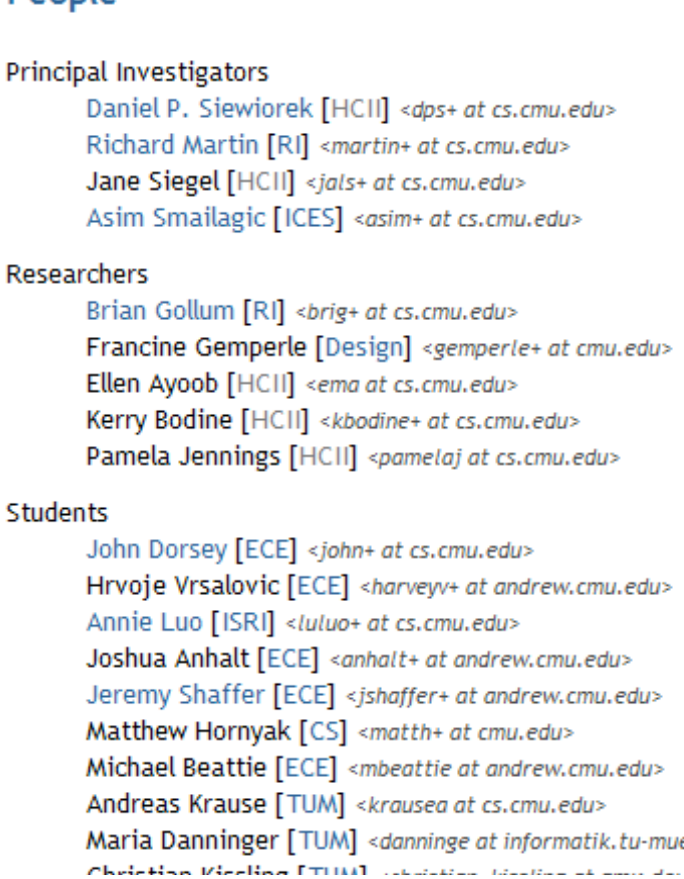
No. F05-HE-26	**Problem**

Name
Email addresses for people are not links

Evidence

Heuristic: Flexibility and efficiency of use

Interface aspect:



People

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Andreas Krause [TUM] <krausea at cs.cmu.edu>
Maria Danninger [TUM] <danninge at informatik.tu-muench

Above is a partial list of the people in the group, followed by their email addresses. The email addresses are plain text.

Explanation
The capability exists to make email addresses into links so that email can easily be sent to the intended recipient. Users may get annoyed that they have to do it manually.

Severity or Benefit

Rating:	2
Justification	
Frequency:	Low – Many of the users will just be checking out the content about the projects so they will not have the need to send an email.
Impact:	Low – The users will simply have to create an email and manually type in the address.
Persistence:	High – The users will have to manually create the email and type the address each time.
How I weighted the factors:	Despite a high persistence, the impact and frequency are so low that the issue is minor.

Possible solution and/or trade-offs

Make the email addresses into email links.

A possible trade-off is that, as links, the addresses will be harvested for spam.

Relationships

None when the original UAR was written.

No. F05-HE-27	**Problem**

Name

Almost every project goes through a redirect page

Evidence

Heuristic: Flexibility and efficiency of use

Interface aspect:

Above is an example of a project that is redirected to another host.

Explanation

Users will be delayed in getting to the specific project page due to having to wait for the redirect. Alternatively, they will need to expend effort to click on the link to go there manually.

Severity or Benefit

Rating: 2

Justification

Frequency:	High – Many of the project use redirects so many users will encounter it.
Impact:	Low – The users can wait for the automatic redirect or manually travel the redirect.
Persistence:	Moderate – The redirect will still be there next time, but users may develop muscle memory and get better and manually clicking the link to the page.
How I weighted the factors:	The impact is sufficiently low to negate the high frequency and persistence so the issue is minor.

Possible solution and/or trade-offs

The content could just be mirrored locally, maintaining the same layout.

A possible trade-off is the disparate structure introduced by simply mirroring content will be unsettling for the user.

Relationships

None when the original UAR was written.

No. F05-HE-28	**Problem**

Name
All photos do not look like links

Evidence

Heuristic: Recognition rather than recall

Interface aspect:

Above are two examples of photographic images.

Explanation
The only cue that the images are actionable (i.e. links) is provided by the browser when rolling over them with the mouse. Users are unlikely to discover it until after spending a bit of time exploring the site.

Severity or Benefit

Rating:	2
Justification	
Frequency:	High – Many photos are scattered through the site. Most users will encounter them.
Impact:	Moderate – Most photos link to larger versions of themselves, which cannot be accessed by other mechanisms. A few are links to other pages, which can be accessed by more prominent links.
Persistence:	Low – Once known that photos link, most users will remember since it is done consistently.
How I weighted the factors:	The low persistence and moderate impact offset the high frequency resulting in a minor issue.

Possible solution and/or trade-offs

Provide a textual caption for photos indicating that clicking will show a larger version. For navigation photos, place the photos nearer to other navigational links so an association can be made.

A possible trade-off is that the visual design of pages may need to be reworked due to changes regarding the photos.

Relationships

F05-HE-37 Person image does not look like link

No. F05-HE-29	**Problem**

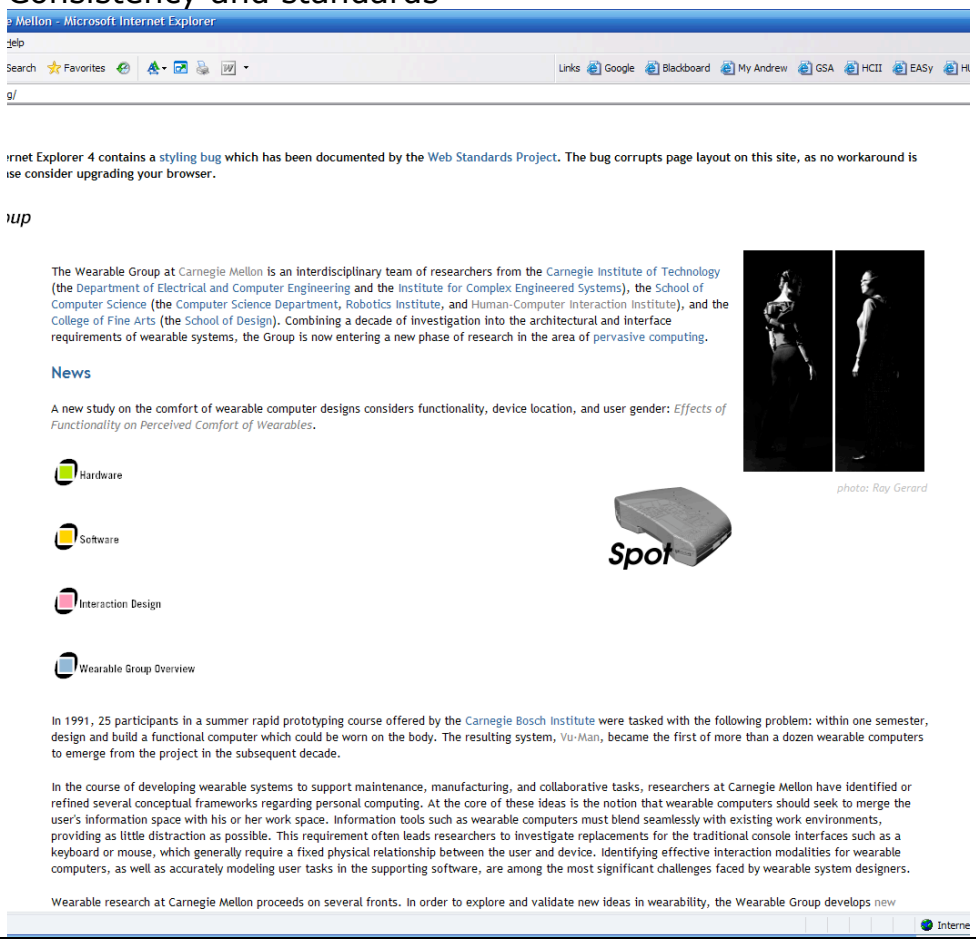
Name

SPOT image on main page is unusually located

Evidence

Heuristic: Consistency and standards

Interface aspect:



Explanation

The Spot image is somewhat floating on the left side so it is unclear what it is associated with.

Severity or Benefit

Rating: 1.67

Justification

Frequency:	High – It is the main page some many users will notice it.
Impact:	Low – The user can use the main navigation menu to access the Spot project.
Persistence:	Low – Once the user knows that the Spot image is a link to the project, the user will remember it.
How I weighted the factors:	The low impact and persistence offset the frequency so the issue is minor.

Possible solution and/or trade-offs Move the Spot image in line with the menu. A possible trade-off is that it will confuse the user since the image is so different than the menu items.
Relationships None when the original UAR was written.

No. F05-HE-30	**Problem**

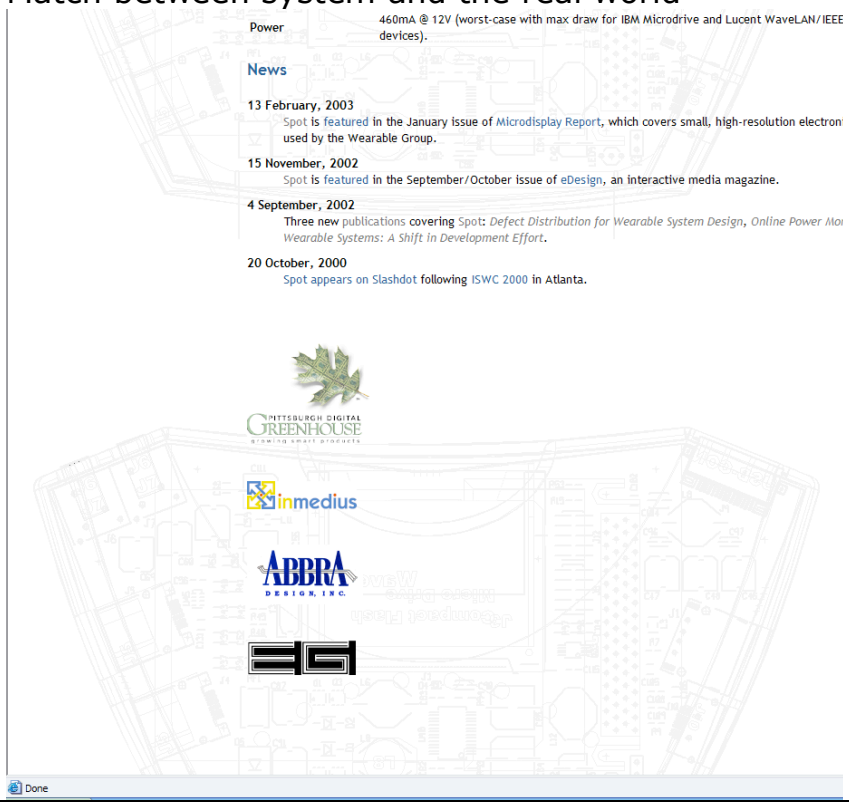
Name

Sponsors are not labeled as such on SPOT page

Evidence

Heuristic: Match between system and the real world

Interface aspect:



Explanation

The sponsor images at the bottom of the Spot page do not have any indication of their purpose so it might confuse users.

Severity or Benefit

Rating: 1.67

Justification

Frequency:	Low – The images are present at the bottom of the page on a specific project so few users will encounter it.
Impact:	High – The sponsors are not listed anywhere else so it will be difficult to overcome.
Persistence:	Low – Once known that they are sponsors, the user will likely remember.
How I weighted the factors:	The low frequency and persistence offset the high impact resulting in a minor issue.

Possible solution and/or trade-offs

Add a label indicating that the images represent sponsors.

No trade-offs are evident at this time.

Relationships
None when the original UAR was written.

No. F05-HE-31	**Problem**

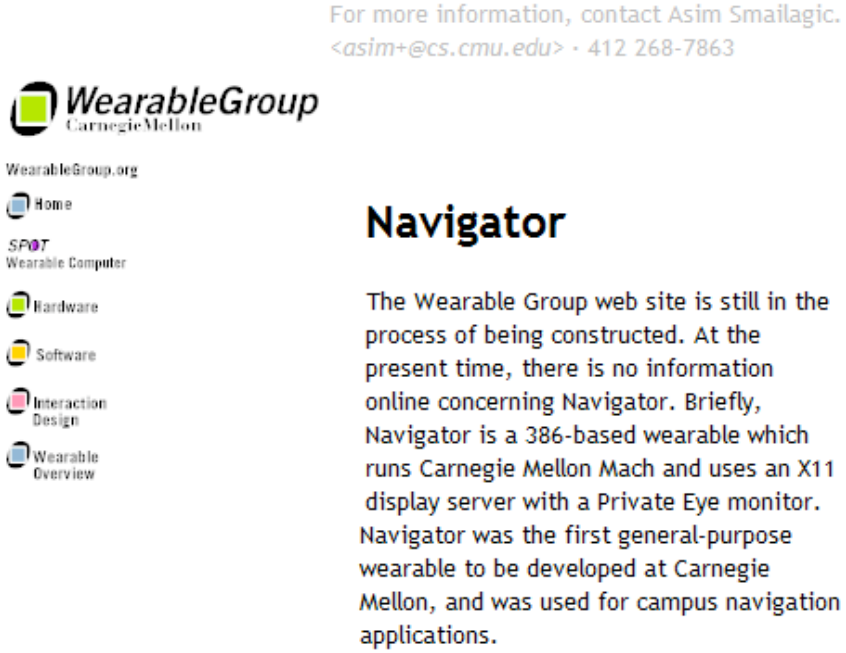
Name

Navigator project page is just a "no info yet" page

Evidence

Heuristic: Aesthetic and minimalist design

Interface aspect:



Above is the Navigator project page.

Explanation

The page does not provide enough information to warrant a separate page.

Severity or Benefit

Rating: 1.67

Justification

Frequency:	Moderate – As a specific project, only some users will encounter it.
Impact:	Low – The user will simply go back after seeing there is no content, costing little time.
Persistence:	High – So there is no information *yet* the user will need to check back each time to see if it is there.
How I weighted the factors:	The low impact offsets the frequency and persistence so the issue is minor.

Possible solution and/or trade-offs

Provide the information on the project list page.

A possible trade-off is that users might get confused that Navigator does not have its own page.

Relationships

None when the original UAR was written.

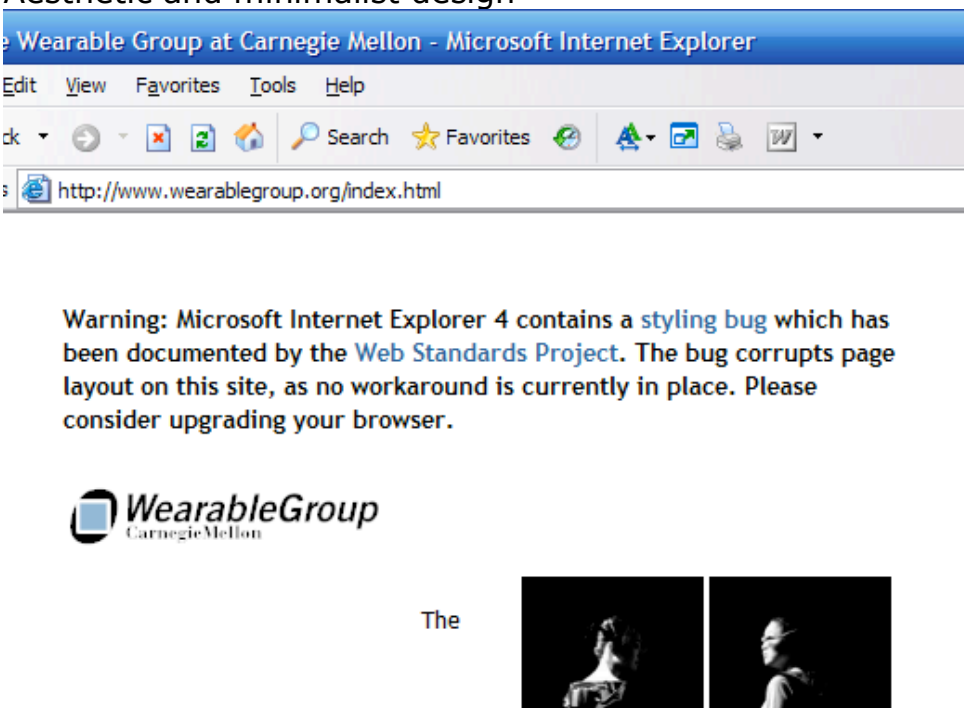
No. F05-HE-32	**Problem**

Name
IE4 warning is not needed

Evidence

Heuristic: Aesthetic and minimalist design

Interface aspect:



The warning shown above is on most, if not all, pages.

Explanation
Internet Explorer 4 is several versions old. Only a few percent of Web users use it. It is alarming and distracting for most users.

Severity or Benefit

Rating: 1.67

Justification

Frequency:	High – Since it is on most pages and few people use IE4, almost everyone will encounter the issue.
Impact:	Low – Most users will quickly determine that the warning does not apply and ignore it.
Persistence:	Low – Since the location of the warning is consistent, users will be able to ignore it completely after a couple encounters.
How I weighted the factors:	The low impact and persistence more than offset the frequency so the issue is minor.

Possible solution and/or trade-offs
Remove the warning.

A possible trade-off is that a few people may still use IE4 and encounter the bug without realizing how to resolve it.

Relationships
None when the original UAR was written.

No. F05-HE-33	**Problem**

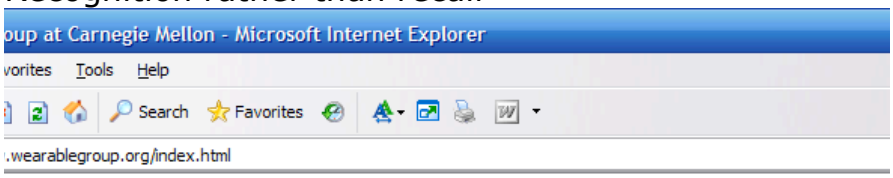
Name

No indication that clicking photo just enlarges it

Evidence

Heuristic: Interface aspect:

Recognition rather than recall



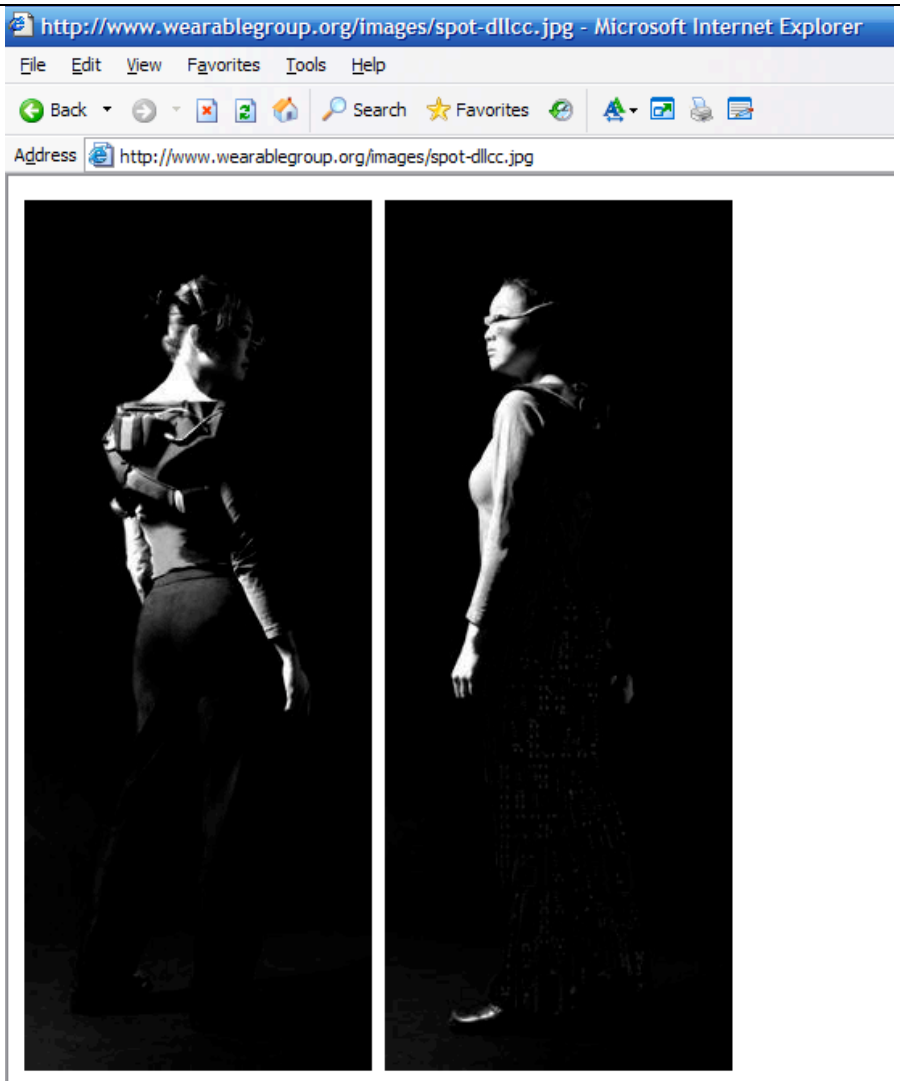
: Microsoft Internet Explorer 4 contains a styling bug which has been documented by the ndards Project. The bug corrupts page layout on this site, as no workaround is currently Please consider upgrading your browser.

earableGroup
negieMellon

The Wearable Group at Carnegie Mellon is an interdisciplinary team of researchers from the Carnegie Institute of Technology (the Department of Electrical and Computer Engineering and the Institute for Complex Engineered Systems), the School of Computer Science (the Computer Science Department, Robotics Institute, and Human-Computer Interaction Institute), and the College of Fine Arts (the School of Design). Combining a decade of investigation into the architectural and interface requirements of wearable systems, the Group is now entering a new phase of research in the area of

photo: Ray Gerard

Clicking on the photo above navigates to the larger version below.



Explanation

Images are commonly used for navigation while others do provide an enlarged version. The user will not know prior to trying it so they may waste time or be surprised.

Severity or Benefit

Rating:	1.33
Justification	
Frequency:	Moderate – There are several photos throughout the site so many users are likely to use them at some point.
Impact:	Low – The user will simply go back if they were uninterested.
Persistence:	Low – After trying a few, the user will learn that photos link to larger versions.
How I weighted the factors:	The impact is so low that, with low persistence and moderate frequency, the issue is cosmetic.

Possible solution and/or trade-offs Add a caption to photos that says "click to enlarge". A possible trade-off is that it will take a little more room.
Relationships None when the original UAR was written.

No. F05-HE-34	**Problem**

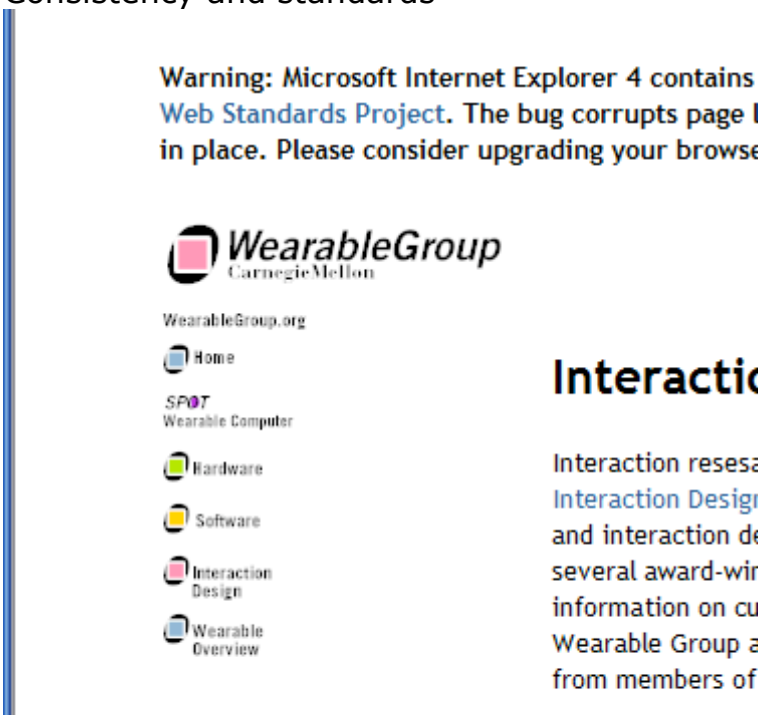
Name

Logo looks like menu items, but is not a link

Evidence

Heuristic: Consistency and standards

Interface aspect:



Above is the logo and menu from the Interaction Design section.

Explanation

The site logo looks very similar to all the menu items immediately below it, but it is not a link. Users will expect it to be a link and possibly be frustrated that it is not. Additionally, most sites have their logo link to the main page.

Severity or Benefit

Rating: 1.33

Justification

Frequency:	High – The logo is on all pages so most users will notice it.
Impact:	Low – There is a link right below to the main page, which is where logos normally link.
Persistence:	Low – Once known, users will remember that it is not a link.
How I weighted the factors:	The impact and persistence are so low that the issue is cosmetic.

Possible solution and/or trade-offs Remove the explicit link to the main page and have the logo serve that purpose. No trade-offs are evident at this time.
Relationships None when the original UAR was written.

No. F05-HE-35	**Problem**

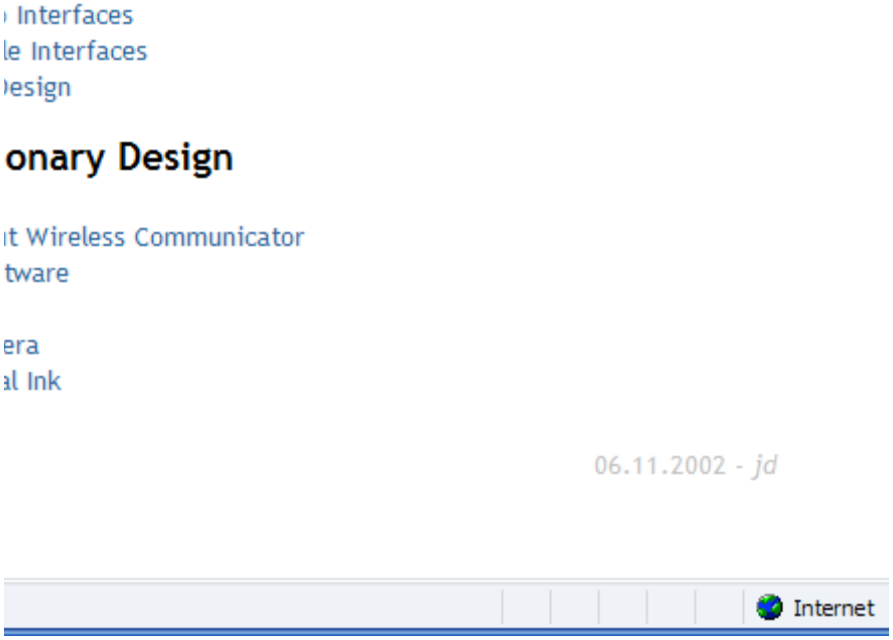
Name

Last updated date is ambiguous/cryptic

Evidence

Heuristic: Match between system and the real world

Interface aspect:



The last updated info is in the lower right corner above.

Explanation

The last updated date is not clearly labeled as such. Most users will not be familiar enough with web site administration to understand it. The letters after the date will add to the confusion.

Severity or Benefit

Rating: 1.33

Justification

Frequency:	Moderate – The text is low contrast and at the bottom of the page so not all users will notice.
Impact:	Moderate – The user will eventually just assume it is a last updated stamp since it is the general format of a date and there are no other possibilities.
Persistence:	Low – The user will likely remember the meaning since they spent some time coming up with it.
How I weighted the factors:	Despite moderate frequency and impact, the cost of not understanding is so low that the issue is cosmetic.

Possible solution and/or trade-offs

Either label the information or make it not visible.

No trade-offs are evident at this time.

Relationships

None when the original UAR was written.

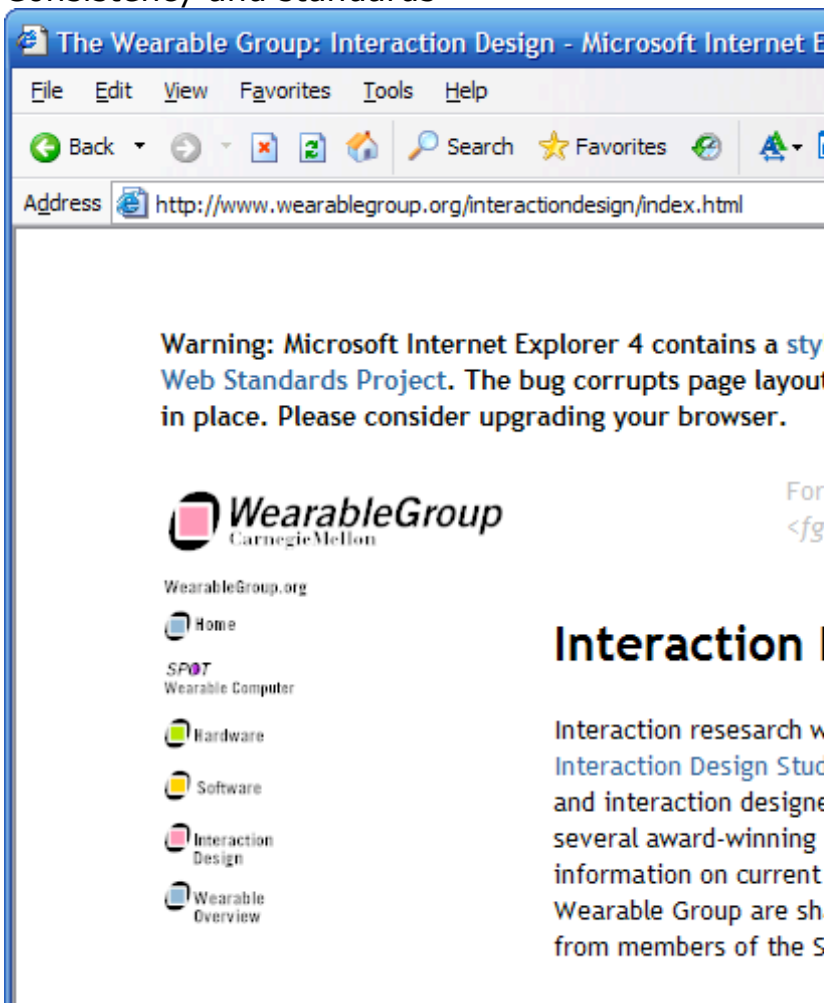
No. F05-HE-36	**Problem**

Name
SPOT is only project with its own major link in menu

Evidence

Heuristic: Consistency and standards

Interface aspect:



Above is the menu with the Spot link from the Interaction Design page.

Explanation
The Spot project is the only project that has a link in the site menu. Users will wonder what is special about it. They may also get confused about the structure of the web site and lose the association between Spot and the hardware section.

Severity or Benefit

Rating:	1
Justification	
Frequency:	High – The Spot link is in the menu for every page except for the main page so many users will see it.
Impact:	Low – The user can easily see that the link takes them to the same page as the Spot link from the Hardware section so they will no longer be confused.
Persistence:	Low – Once known, the user will likely remember that there is nothing special about the Spot link.
How I weighted the factors:	The impact and persistence are so low that the issue is cosmetic.

Possible solution and/or trade-offs

Add a label such as "featured project" to make it clear the relation and meaning of the link.

No trade-offs are evident at this time.

Relationships

None when the original UAR was written.

No. F05-HE-37	**Problem**

Name

Person image does not look like link

Evidence

Heuristic: Recognition rather than recall

Interface aspect:

e

f

photo: Ray Gerard

Above is an example of a photo of a person.

Explanation

The only cue that the images are actionable (i.e. links) is provided by the browser when rolling over them with the mouse. Users are unlikely to discover it until after spending a bit of time exploring the site.

Severity or Benefit

Rating: 1

Justification

Frequency:	High – Many photos are scattered through the site. Most users will encounter them.
Impact:	Moderate – Most photos link to larger versions of themselves, which cannot be accessed by other mechanisms.
Persistence:	Low – Once known that photos link, most users will remember since it is done consistently.
How I weighted the factors:	Despite factors indicating an otherwise minor issue. The content is so non-crucial that the issue is reduced to cosmetic.

Possible solution and/or trade-offs

Provide a textual caption for photos indicating that clicking will show a larger version.

No trade-offs are evident at this time.

Relationships

F05-HE-28 All photos do not look like links

No. F05-HE-38	**Problem**

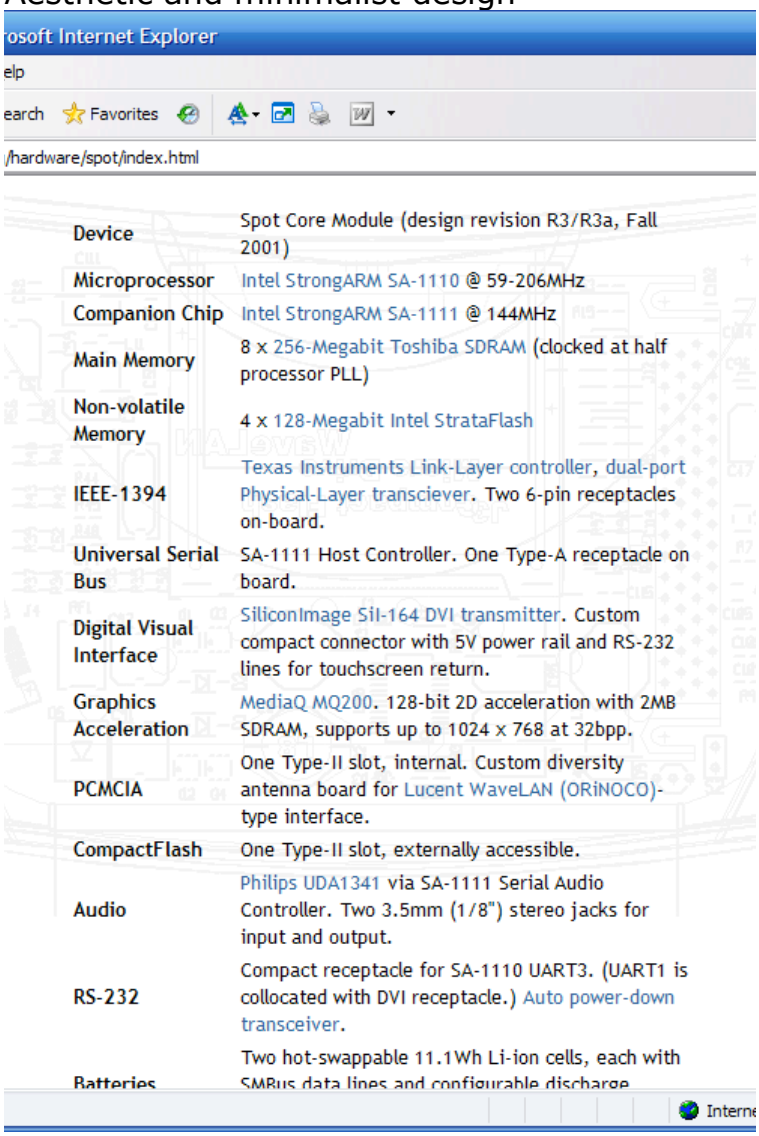
Name

Many users may not be interested in tech specs

Evidence

Heuristic: Aesthetic and minimalist design

Interface aspect:



Above are the technical specs from the Spot page.

Explanation

Many of the users, such as press or people new to the field will not be interested in the technical specs. They may even get intimidated by them. It will just be clutter for those users.

Severity or Benefit

Rating:	0.67
Justification	
Frequency:	Low – Only some users will see the specs since they are on only certain pages and at the bottom.
Impact:	Low – Since the specs are short, they can be easily skipped over.
Persistence:	High – The user will have to skip over the specs each time.
How I weighted the factors:	The impact and frequency are so low that the issue is cosmetic.

Possible solution and/or trade-offs

Add navigational aids to the top of project pages so users can jump to the subsection they are interested in.

No trade-offs are evident at this time.

Relationships

F05-HE-05 Project pages do not have consistent structure/layout