SecondWATCH: a workspace awareness tool based on a 3-D virtual world
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Problem statement
- Software engineers spend about 70 percent of their time on cooperative activities [1].
- Awareness of others’ activities is essential in facilitating coordination in a team.
- Awareness - “an understanding of the activities of others, which provides a context for one’s own activities” [2].
- Results of several field studies in large software companies such as Microsoft [3].
  - coworker and artifact awareness are most common information needs for developers
  - Inadequate tool support to help acquire them

Proposed Solution
- Build a workspace awareness tool (named SecondWATCH) based on Second Life (SL), a 3-D online Virtual World.
- SecondWATCH informs developers of workspace awareness information by
  - Monitoring team members’ activities on their local workspaces, version control repository, and bug tracking system.
  - Extracting and analyzing awareness info
  - Visualizing it real-time in SL as a common view shared by the whole team.
- SecondWATCH provides three type of info:
  - Coworker presence information: developers’ status, and which task they are working on.
  - Real-time artifact information: For each artifact, which developers are changing it locally.
  - History artifact information: For each artifact, how many revisions are contained, who has checked in most recently or most often, and how recently the latest change has been committed.

3-D city metaphor
- Based on city metaphor in the CodeCity project[4].
- Uses city buildings to represent files,
- Uses city district to represent folders,
- The layout of the city represents the overall file structure of the software project.
- The buildings shown as differently colored stacked cylinders stand on top of city districts shown as flat blue rectangles (with color saturation representing nested folders).

Figure 1. Visualization of the project Azureus
Figure 2. a) Eclipse b) Second Life c) Smoke representing active artifact d) Token representing the developer making local changes e) Active task f) Highlighted artifact

Table 1. Visualization mapping

<table>
<thead>
<tr>
<th>Properties of a building</th>
<th>Properties of a software artifact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height (Number of floors)</td>
<td>Number of revisions</td>
</tr>
<tr>
<td>Location of the floor</td>
<td>When the revision was checked-in (most recent revision always on top)</td>
</tr>
<tr>
<td>Color</td>
<td>The-developer who commits the revision</td>
</tr>
<tr>
<td>Color transparency</td>
<td>How recent each revision was checked-in</td>
</tr>
<tr>
<td>Smoke emitting from the top of the building</td>
<td>Real-time artifact information (dynamic)</td>
</tr>
<tr>
<td>An icon rotating around the building</td>
<td>Active artifact (Those artifacts that are being changed locally by at least one developer)</td>
</tr>
<tr>
<td>The building is shaking</td>
<td>More than one developers are changing the same artifact</td>
</tr>
<tr>
<td>The building with lights on (glowing)</td>
<td>Highlighted artifact</td>
</tr>
</tbody>
</table>

For more information: http://vital.cs.ohiou.edu/vitalwiki/index.php/SecondWATCH

References