

Extending an XML environment definition language for spoken dialogue and web-based interfaces

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Developing User Interfaces with XML: Advances on User Interface Description Languages
May 25, 2004. Gallipoli, Italy

Outline

- Introduction
- Environment representation
- Spoken dialogue interface: Odisea
- Web-based interface: Jeffrey
- Questions?

Prototype

Multimedia Information

- TV set
- Two hi-fi speakers
- Radio tuner
- IP Web cam
- Flat Screen



Application agents

- E-mail agent
- Notification agent
- Regards agent
- Paintings agent
- Security agent
- Electrical door lock
- Smart cards
- Relays (lights)
- Switches
- Alphanumeric screen

Voice Interaction

- Wireless microphone
- Hi-fi speakers

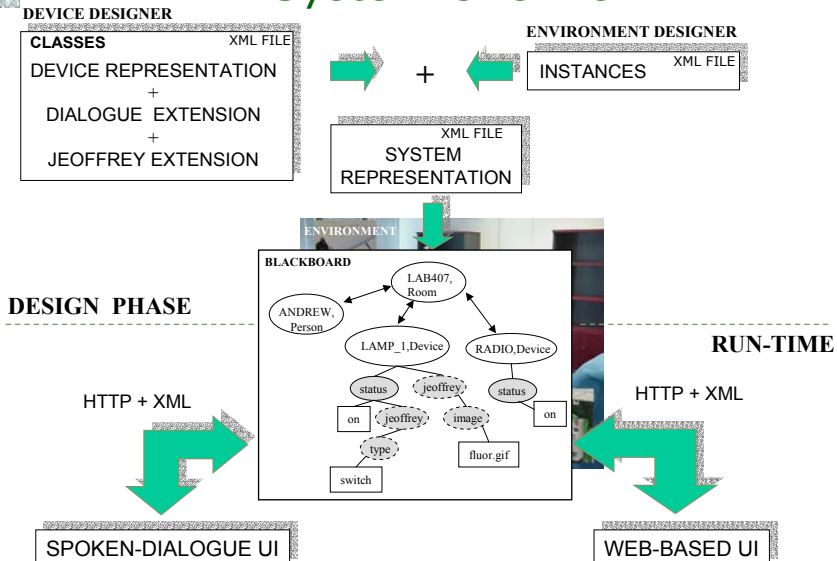
Home Networking

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System Overview



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Environment entity representation

- The entity representation is written in a XML document.
- Each environment element is represented by an entity.
- Each entity has a name, type and a set of properties.
- Besides, this representation allows to model relationships between environment component
- Entities can be added or removed from the blackboard on the fly.

```

<entity name="Speaker_1" type="device">
  <property name="Enable"/>
  <property name="Ready"/>
  <property name="Status"/>
  <property name="Port"/>
  <property name="IP"/>
  <property name="Bandwidth"/>
  <property name="Left_Volume"/>
  <property name="Right_Volume"/>
  <property name="Master_Volume"/>
</entity>

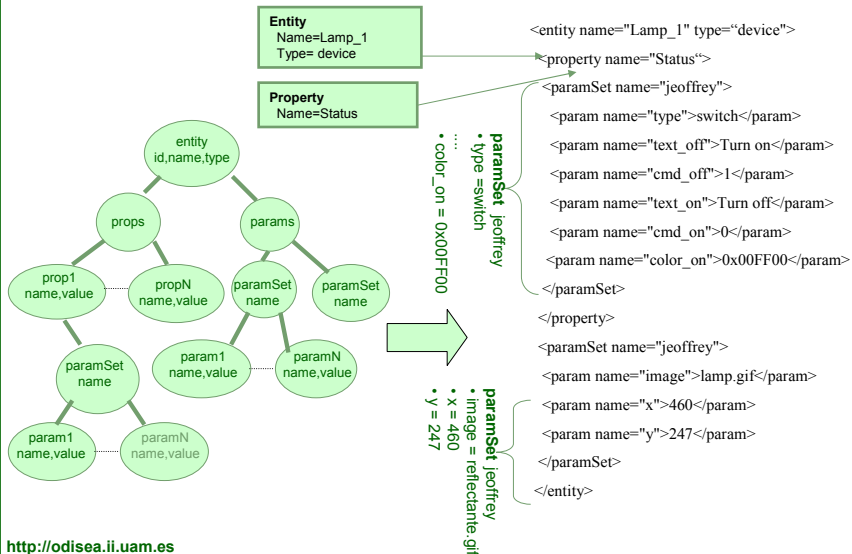
<entity name="lab_B403" type="Room">
  <entity name="Lamp_1"/>
  <entity name="Lamp_2"/>
  <entity name="LampV1"/>
  <entity name="LampV2"/>
  <entity name="Door_1"/>
  <entity name="Speaker_1"/>
  <entity name="Radio"/>
  <entity name="Video"/>
</entity>
    
```

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Entity Extended



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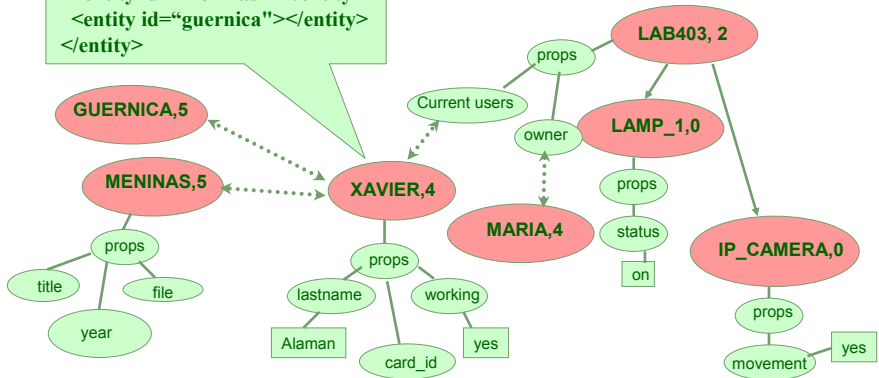
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- 0 - Light
- 2 - Room
- 4 - Person
- 5 - Painting

Relationship model

```
<entity name="xavier">
.....
.....
<entity id="meninas"></entity>
<entity id="guernica"></entity>
</entity>
```

Relations between entities
.....



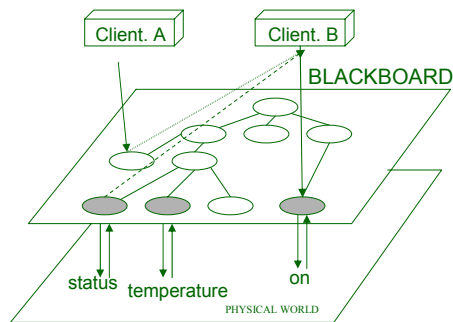
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Blackboard interaction

- GET
- SET
- ADD
- REMOVE
- ADDRELATION
- REMOVERELATION
- SUBSCRIBE
- UNSUBSCRIBE

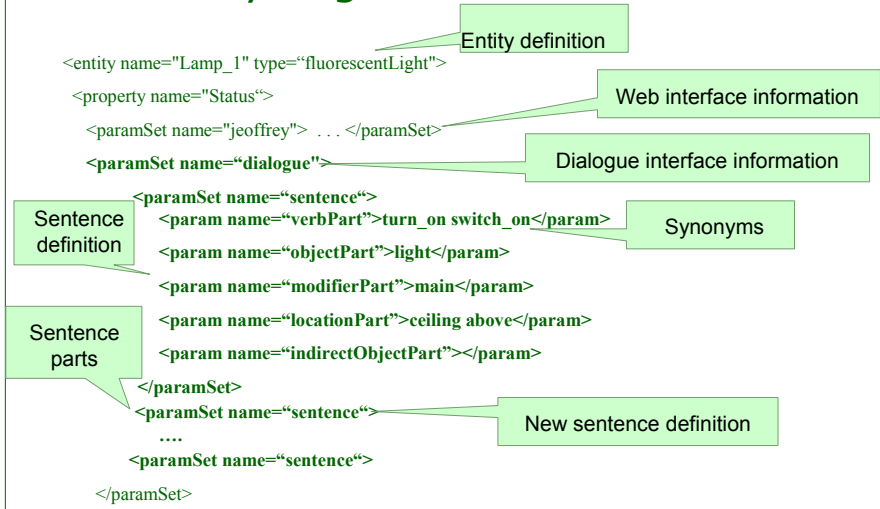


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Entity linguistic information

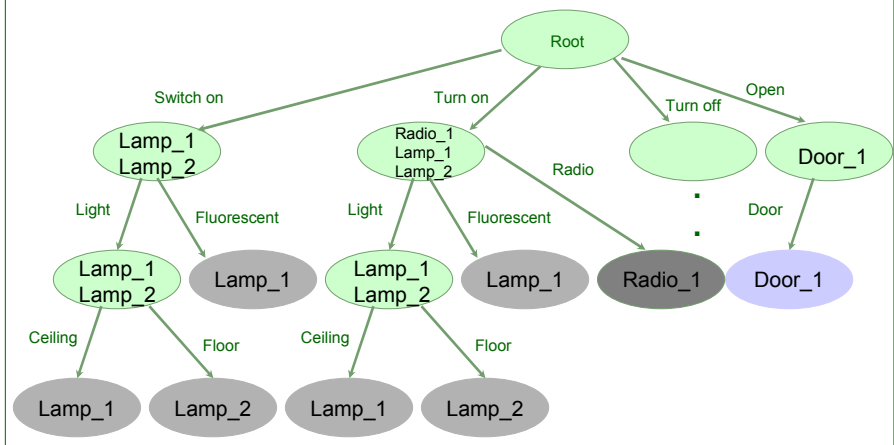


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Tree generation



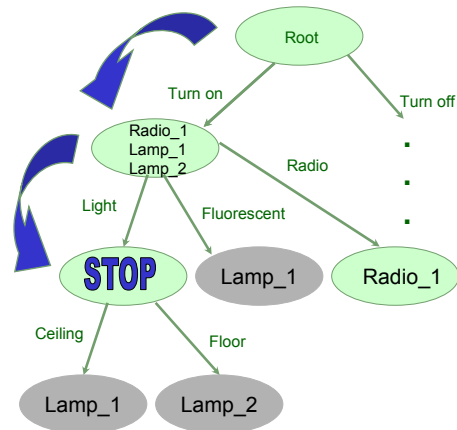
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Interpretation

- User utterance:
“Could you turn on the light, please”.
- Semantic tags:
“Turn on” and “light”.



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Interpretation

- If it stops in an action node:
 - It executes its associated action method.
- If it stops in an intermediate node:
 - It goes down its children, and depending on their state:
 - It executes an action.
 - It offers all the possible actions.
 - It utters a more general clarification question.

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UA Jeffrey

Jeffrey

Java Applet Window

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UA Jeffrey

Jeffrey

```

<entity name="Lamp_1" id="1" type="0">
  <property name="Status">
    <paramSet name="jeoffrey" id="2">
      <param name="type">switch</param>
      <param name="text_off">Turn on</param>
      <param name="cmd_off">1</param>
      <param name="text_on">Turn off</param>
      <param name="cmd_on">0</param>
      <param name="color_on">0x00FF00</param>
    </paramSet>
  </property>
  <paramSet name="jeoffrey" id="2">
    <param name="image">lamp.gif</param>
    <param name="x">460</param>
    <param name="y">247</param>
  </paramSet>
</entity>

```

Java Applet Window

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