

Improved Media Tools for the Access Grid

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Aims

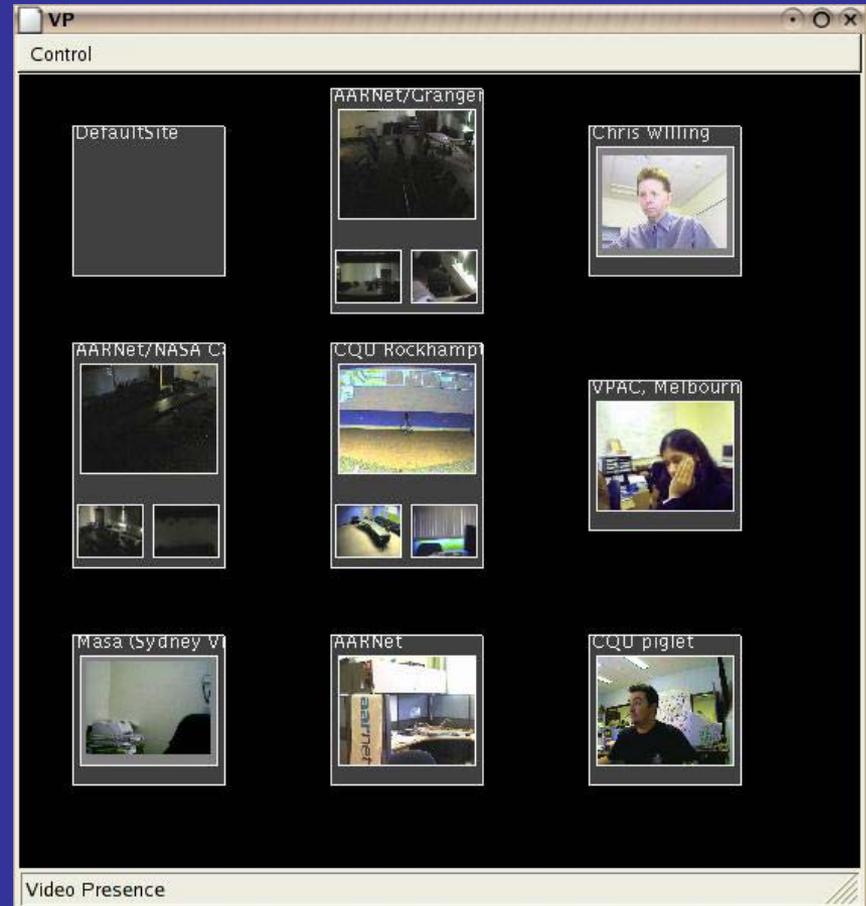
- Improve usability of the media tools for AG node operators
- Allowed greater flexibility in AG node design
- Improve the AG experience for participants

Problems with existing Media Tools

- No grouping of video streams based on sender
- Placement of video tiles is manual
- Lip sync
- Separate applications for video and audio often running on different machines
- It is often difficult to determine who is talking
- Node operator must switch between computers to control different aspects of media

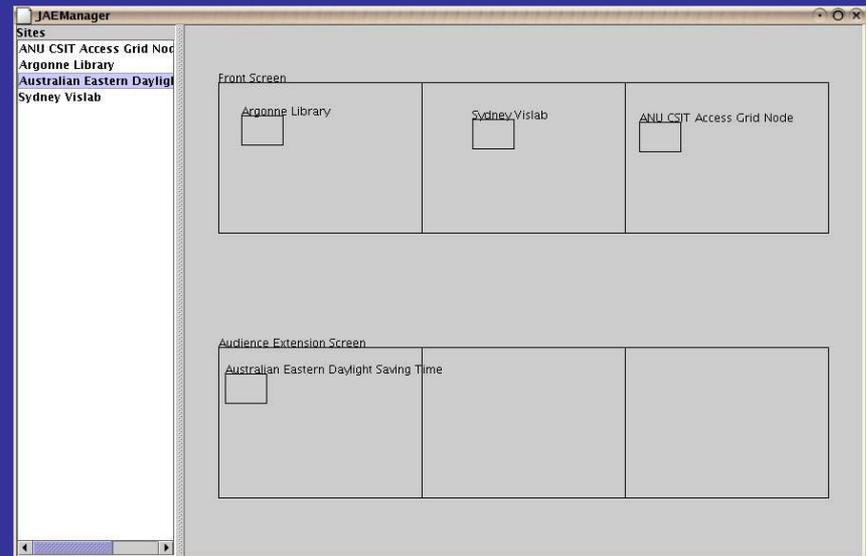
VP : The first step

- Uses OpenGL to take advantage of video hardware in a portable way
- Introducing the Site tile
- Automatic layout
- Different layout schemes for video sources from a given site
- Ported to Windows, Linux and OSX



Media Manager

- A central user interface to control everything
- Repository for configuration information
- Interface for manual site tile placement
- Interface for control of audio output



Configuration of a Node

- Similar to Venue Client configuration of services but no GUI (yet!)
- XML Configuration file
- Display Screens and Speaker locations specified in real world coordinates
- Large degree of flexibility in how a node can be layed out

Display Screen Configuration

Example 1 : A Typical Node

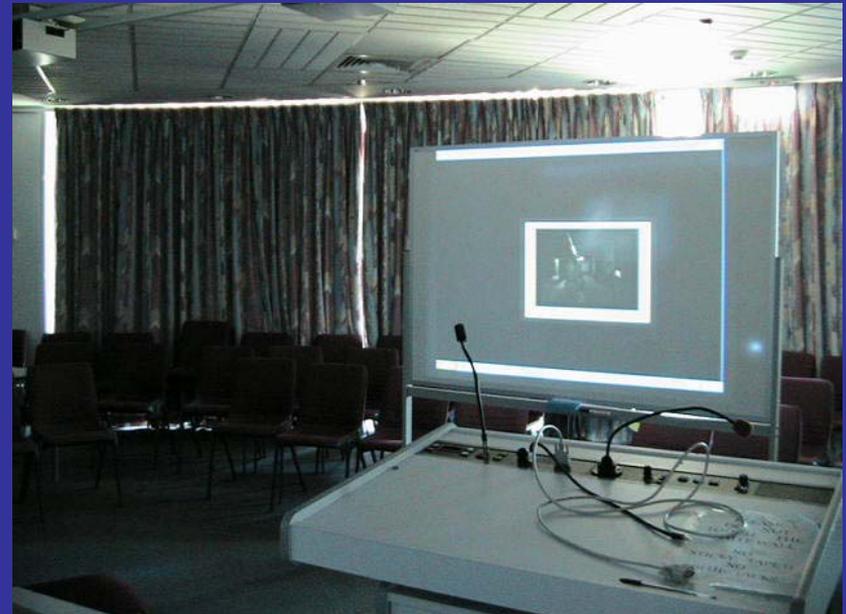
```
<?xml version="1.0" encoding="utf-8" ?>
<!-- A basic configuration ie single screen display -->
<system>
  <videoscreen id="screen">
    <normal value="0.0 0.0 1.0" />
    <up value="0.0 1.0 0.0" />
    <origin value="0.0 0.0 -0.5" />
    <videoservice id="ag1-display">
      <address value="150.203.20.101" />
      <topleftcorner value="-2.00 1.5" />
      <bottomrightcorner value="2.00 -1.5" />
      <screencoordinates x="0" y="0" width="3072" height="768" />
      <fullscreen value="true" />
    </videoservice>
  </videoscreen>
</system>
```



Display Screen Configuration

Example 2 : A Typical Node with Audience Extension

```
<?xml version="1.0" encoding="utf-8" ?>
<!-- A basic configuration ie typical desktop arrangement -->
<system>
  <videoscreen id="Screen">
    <normal value="0.0 0.0 1.0" />
    <up value="0.0 1.0 0.0" />
    <origin value="0.0 0.0 -0.5" />
    <videoservice id="Main Display">
      <address value="150.203.20.101" />
      <topleftcorner value="-2.40 0.6" />
      <bottomrightcorner value="2.40 -0.6" />
      <screencoordinates x="0" y="0" width="3072" height="768" />
      <fullscreen value="true" />
    </videoservice>
  </videoscreen>
  <videoscreen id="Audience Extension">
    <normal value="0.0 0.0 -1.0" />
    <up value="0.0 1.0 0.0" />
    <origin value="0.0 0.0 0.5" />
    <videoservice id="Audience Extension">
      <address value="150.203.20.102" />
      <topleftcorner value="-0.80 0.6" />
      <bottomrightcorner value="0.80 -0.6" />
      <screencoordinates x="0" y="0" width="1024" height="768" />
      <fullscreen value="true" />
    </videoservice>
  </videoscreen>
</system>
```



Audio Configuration

Example 3 : A Simple Audio Configuration

```
<?xml version="1.0" encoding="utf-8" ?>
<!-- A basic audio configuration -->
<system>
- <audioservice id="Audio">
  <address value="150.203.20.5" />
  <device value="<default>" />
  <bound origin="0.0 0.0 -0.5" width="0.5 0.0 0.0"
    height="0.0 0.5 0.0" depth="0.0 0.0 0.5" />
  <speaker id="0" position="-0.5 0.0 -0.5" />
  <speaker id="1" position="0.5 0.0 -0.5" />
</audioservice>
</system>
```

Simple Audio Localisation

- What to do if you want more speakers?
- Configure more audio services, and set their bounds appropriately
- No need for expensive sound card
- Example of a Desktop system



3D Audio Localisation

- 3D Spatialisation of audio using Vector Based Amplitude Modulation (VBAP)
- Ability to have multiple audio processes to allow large speaker arrays
- Ability to use true surround sound for localisation of audio to a site tile
- Uses Beehive and JSYN for 3D spatialisation of audio

Placement of Video Tiles

- Manual, Automatic or Predefined
- Media Manager broadcasts message indicating new position of video tiles
- Based on configuration information, individual video programs determine if they process video for the site and where it is displayed.
- Similarly for audio programs.

Predefined tile placement

- Based on Site
- Useful for regular meetings/events with the same participants, e.g. AG Townhall meetings
- Currently implemented as a simple XML file

Site tile highlighting

- Highlight a video tile to indicate that audio is coming from that site
- Audio program calculates volume metering for audio sources it is responsible for and broadcasts a message
- Video programs listen for these messages and highlight the tile(s)

Remote Control

- Removing the Node operator from the room. Is this a good idea?
- With Venue Client + Media Manager it is possible now
- Project at ANU to have all AG nodes managed from a central place.

Usability Studies

- The prototype system that has been developed will be used to study ergonomics of audio localisation and site tile highlighting
- Does 3D localisation, Simple localisation, Stereo localisation work?
- What is the best way to highlight a video tile?

Current Status

- Prototype System Implemented in Java
- Video rendering
- Site tile highlighting
- Simple audio localisation
- VBAP audio localisation (still some audio quality issues)
- Still very alpha and tailored for usability study

Continuing Work

- Usability trials
- A new audio tool with similar goals to VP
- Lip-sync
- Integrating functionality to VP (Site tile highlighting is already implemented)

For the future: Integration into AGtk

- Central place for node configuration, ie Screen/Speaker positions should go into Venue Client
- Addition of the Media Manager service
- Ability to run without Media Manager, ie for PIG's
- Standards for matching audio and video from a given site.

The End

- Questions?