

Using Virtual Reality for Interpreter-mediated Communication and Training

Panagiotis D. Ritsos¹, Robert Gittins¹ and Jonathan C. Roberts¹

School of Computer Science, Bangor University, UK - {p.ritsos, r.gittins, j.c.roberts}@bangor.ac.uk)

Presentation Outline

- To present purpose of project **IVY – Interpreting in Virtual Reality** and the **IVY Virtual Environment (IVY-VE)**
- To present the strategic decisions, resulting design and implementation progress to date, towards the creation of a prototype
- To provide an overview of the main features of our prototype
- Comment on preliminary evaluation and pinpoint identified limitation
- To allow for discussion on future development



The Project IVY Consortium

University of Surrey	(UK)
Uniwersytet im. Adama Mickiewicza	(Poland)
University of Cyprus	(Cyprus)
Steinbeis GmbH & Co. KG für Technologietransfer	(Germany)
Bangor University	(UK)
Eberhard Karls Universität Tübingen	(Germany)
Bar Ilan University	(Israel)



Project IVY – Scope

- The rise of migration and multilingualism in Europe requires **professional interpreters** in business, legal, medical and many other settings.
- Future interpreters need to master an ever broadening **range of interpreting skills and scenarios** – training for which is often difficult to achieve with traditional teaching methods.
- Project IVY employs **3D virtual world** technology to create an **educational space** that supports the acquisition and application of skills required in interpreter-mediated communication.
- Project IVY uses **existing interpreter resources** – audio and video material from previous video conferencing research.



IVY VE – Requirements

- To provide an **intuitive, easy to use interface within a Virtual World** for accessing multimedia material created for interpreting training and simulation.
- To allow **easy scenario management** by users who often are not experts in commuting (i.e., can not/should not write code)...
- ... meaning the creation and modification of existing scenarios in terms of their multimedia content, requiring **basic CRUD functionality**.
- To enable **limited dialogue and monologue synthesis**, resulting in the enrichment of the corpora with different language combinations of existing scenarios.

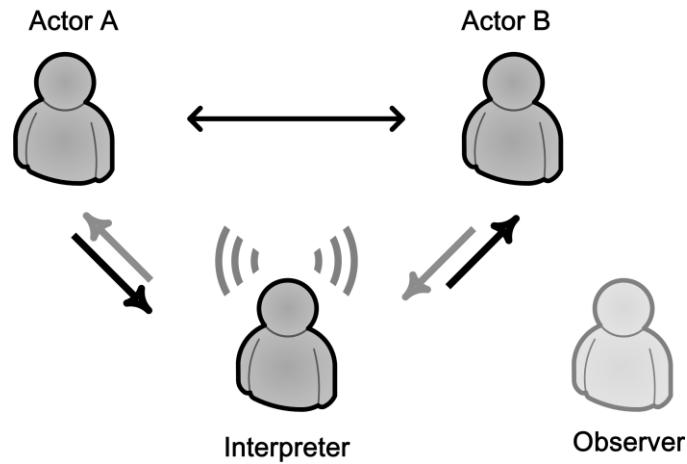


IVY Virtual Environment (IVY-VE) in a nutshell

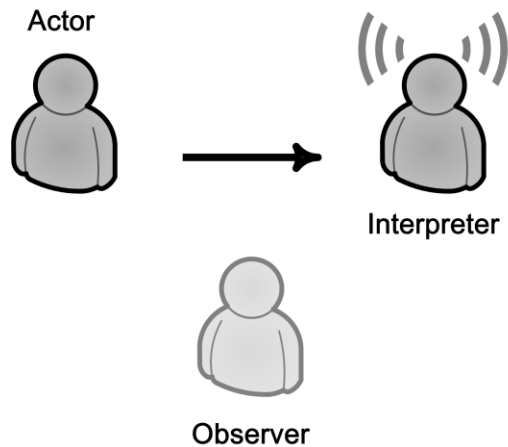
- A dedicated, adaptive 3D virtual environment for
 - **interpreting students** and
 - **future clients** of interpreters
- Supports range of virtual interpreting scenarios (e.g., '*business meeting*') that can be run in different modes:
 - **Interpreting (& Learning Activity) mode**, where students can practice using dialogues and monologues
 - **Exploration mode**, where clients can learn about interpreting
 - **Live interaction mode**, where both groups can engage in role plays
- Uses multilingual **video/audio-based content** for interpreting scenarios, by adapting existing multimedia corpora from the LLP project **BACKBONE** and the **ELISA** corpus, and creating three new corpora in Greek, Russian and Hebrew;
- Supported by two sets of pedagogical material for **interpreter students** and **(future) 'clients'**, e.g. awareness-raising and interpreting exercises.



Project IVY – Scenario forms



Dialogue



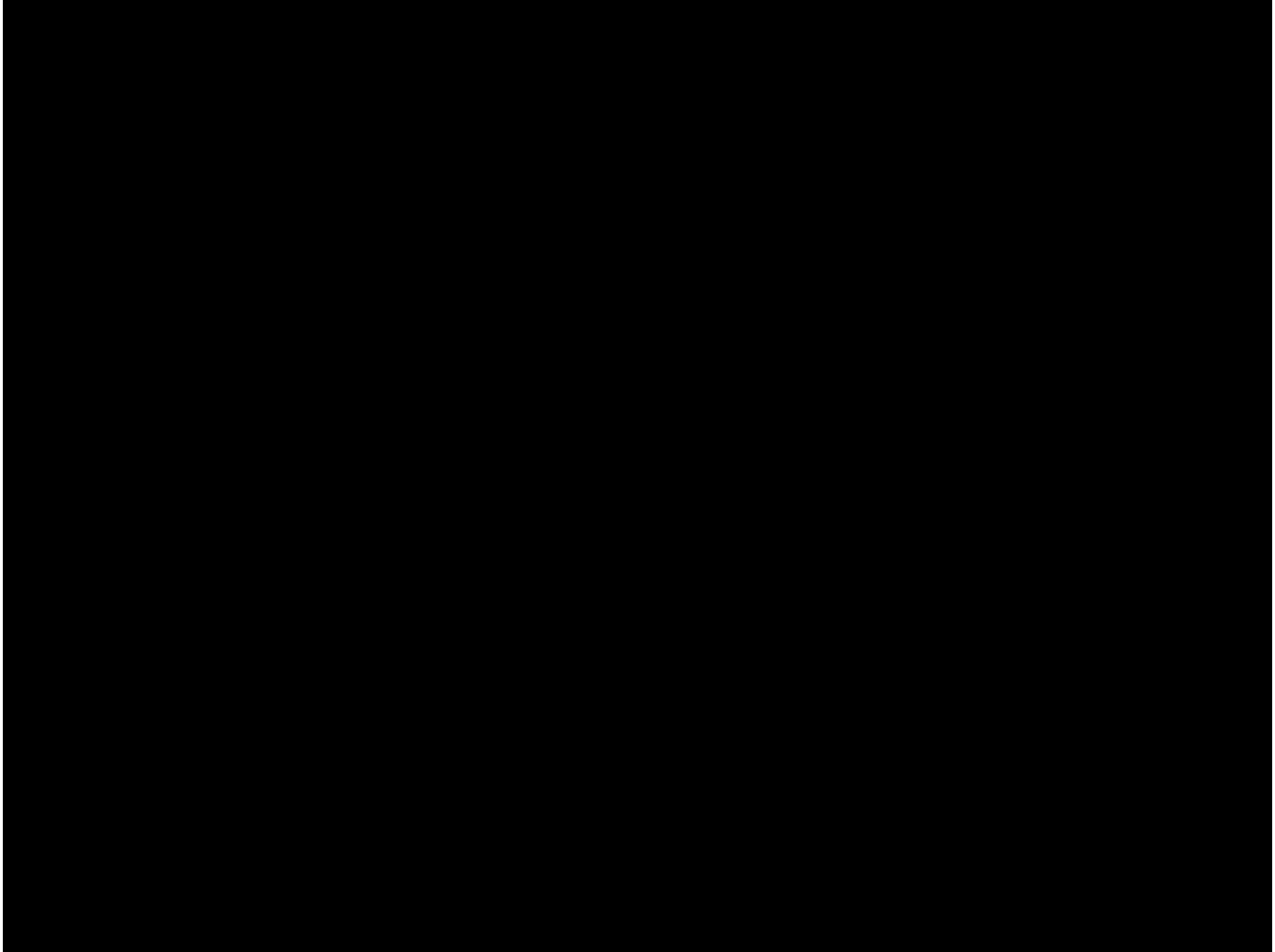
Monologue

IVY Virtual World – Second Life

- **Second Life** was chosen as the Virtual World for our first prototype.
- Exploration of alternatives, such as **OpenSim**, **WebGL** and **Unity3D** will follow in the future.
- Second Life compared to alternatives (OpenSim, ActiveWorlds etc) offers:
 - **Large community**, various add-ons, plugins and examples of customisations.
 - **A platform for social interaction** and education, used by numerous institutions, colleges, universities – thus increasing chances of exposure.
 - Accessibility via **public servers** and it does not require that you run the VW yourself.



IVY Virtual World – Second Life Videos - I



IVY VE – Lack of Instancing & Scalability

- Due to **limits on the number of building blocks (primitives)** available to the IVY Island and the **lack of instancing** mechanisms in SL, IVE-VE uses a collection of **unique, in-world locations** for each type of scenario (e.g., *Classroom, Meeting Office*).
- Therefore, a scenario may share its location with another, being carried out in a similar setting.
- In order to maintain **consistency** in the virtual world **only one scenario can be played per location at a given time**.
- Upon a scenario launch by a user, all scenarios sharing the same location become unavailable for other users.
- Once the user exits the selected scenario, all scenarios sharing the same location become available again.



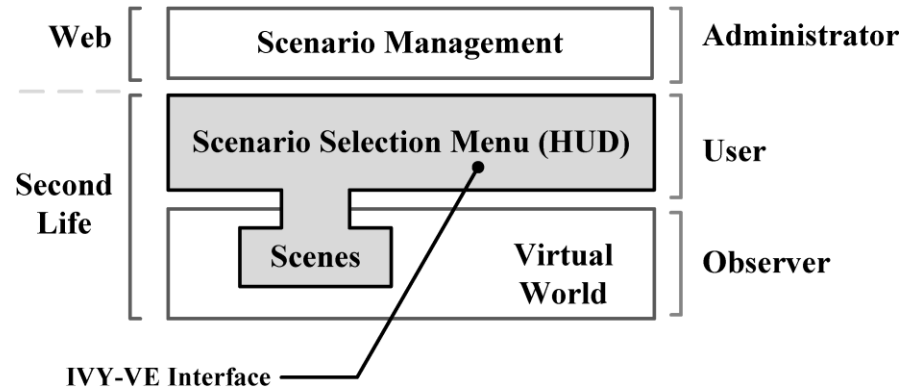
IVY VE – Design Strategies

- Script things in Second Life using LSL
 - + Comparable **aesthetics** and better **integration** with the native SL GUI
 - + Graphics appear crispier, clearer
 - Scripting can be fairly **static** and **requires coding**
 - **Communication with DBs is fairly limited** in terms of size of info that can be transmitted.
- Rely on **web application technologies** as interface creation, database connectivity and overall flexibility surpasses LSL. Therefore...
- ...either **embed SL in a web application**
 - Popular notion, no web viewer supported from Linden Labs.
 - Only *Canvas* from Tripodean Technologies appears to exist at the moment.
- ...or ‘**embed**’ the web application within SL, using **HTML on a Prim**.



IVY VE – Implementation

- Our chosen implementation strategy aspires to merge useful features from both alternatives, resulting into a hybrid solution.



- One module consists of a web application with two entry points. One entry point remains independent of SL and is used by content managers to manage scenarios and users' information, offering basic CRUD functionality.
- The other end is viewable within Second Life, in the form of a 'Heads-up-Display' (HUD), populated from a database, showing available scenarios to the users, having a player functionality and initiating in-world teleport events.

IVY VE – User Classes and Characteristics

- Separating user roles allows controlled access to different parts of the application as well as means of monitoring scenario selection and execution.
- The system's user classes and their respective role descriptions are:
 - **Interpreters/Users**, whose purpose is to explore, participate and exercise with the scenarios in Second Life.
 - **Observers**, whose purpose is to observe other users in Second Life.
 - **Content Managers** who are responsible for user and scenario management.



IVY VE – The IVY Island

- Locations created according to the corpus requirements, trying to keep prim-count to a minimum.
- Reception serves as a central hub and a HUD pick-up point.



IVY VE – Scenario Actors

- We populate the scenarios with additional ‘**actors**’. Currently these actors are manually placed in each location, using Second-life ‘**robots**’ (bots) from **Pikkubot** and **Thoys**.
- Bots are controlled either by using in-world chat to issue commands directly to the bots or through a dedicated server’s telnet prompt.
- We currently use **animation overrides**, to make them appear life-like.
- Our aspiration is to create a service that talks to the bots and relays scenario specific information and teleport commands.
- However... **sound does not appear to originate from the bots**.



IVY VE – Web Application

- The IVY web application is build using the Appfuse 2 open source project (appfuse.org).
- Appfuse, built on the Java platform, uses industry-standard features, such as **Apache Maven** integration, **JPA** support for database operations and popular web frameworks such as **Spring** and **Apache Struts**, employed in this example.
- Appfuse comes with out of the box features, needed in IVY-VE such as:
 - Generic **CRUD** backend
 - **Authentication** and **authorization**,
 - **User management**
 - Strong **Internationalization** support
- Our prototype is deployed using **Apache Tomcat 6.x** and uses the **MySQL 5.x** database.



IVY VE – Audio File Management

- The IVY-VE uses audio extracts (segments), in **MPEG-2 Audio Layer III** format, from the LLP project BACKBONE, wrapped in **XSPF** (XML Shareable Playlist Format) play-lists (scripts) and played within pre-fabricated scenes.
- Audio segments are uniquely named and can be **interchanged** — within each script — to derive further language combinations of that scenario.
- Actors may speak for more than one consecutive segments, allowing greater flexibility in creating scripts where one talks for extended periods.
- However, it is assumed that only one actor talks per audio segment and there is no overlap between actor's speech.
- Each script has **textual information** associated with it, such as brief content information, scene description and domain keywords.



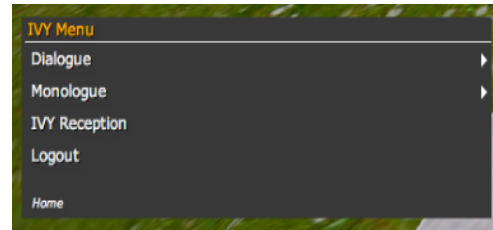
IVY VE – Heads Up Display I

- The HUD is built using the **jQuery JavaScript** library, displaying the list of scenarios in the database as a drill-down menu.
- It is normally attached to the bottom left corner of the user's viewport.
- Audio is being played by means of a **Flash player**, parsing the **XSPF** playlists upon scenario selection.
- Navigation through the island is performed using **slurls**, providing direct url-like **teleport links to locations** within the virtual world.
- Each **slurl** is being called upon scenario launch, triggering the native SL-client teleport interface.

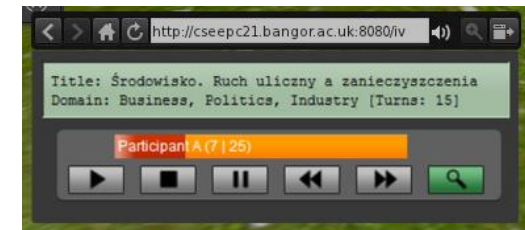
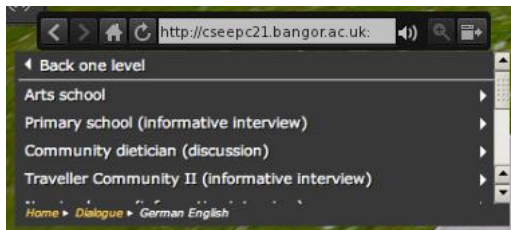


IVY VE – Heads Up Display II

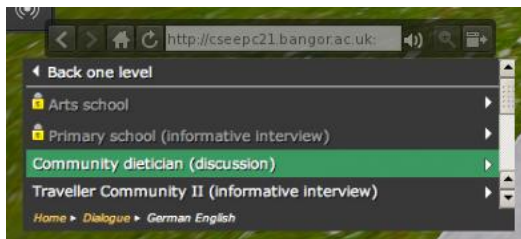
- Login, form selection and language combination selection views



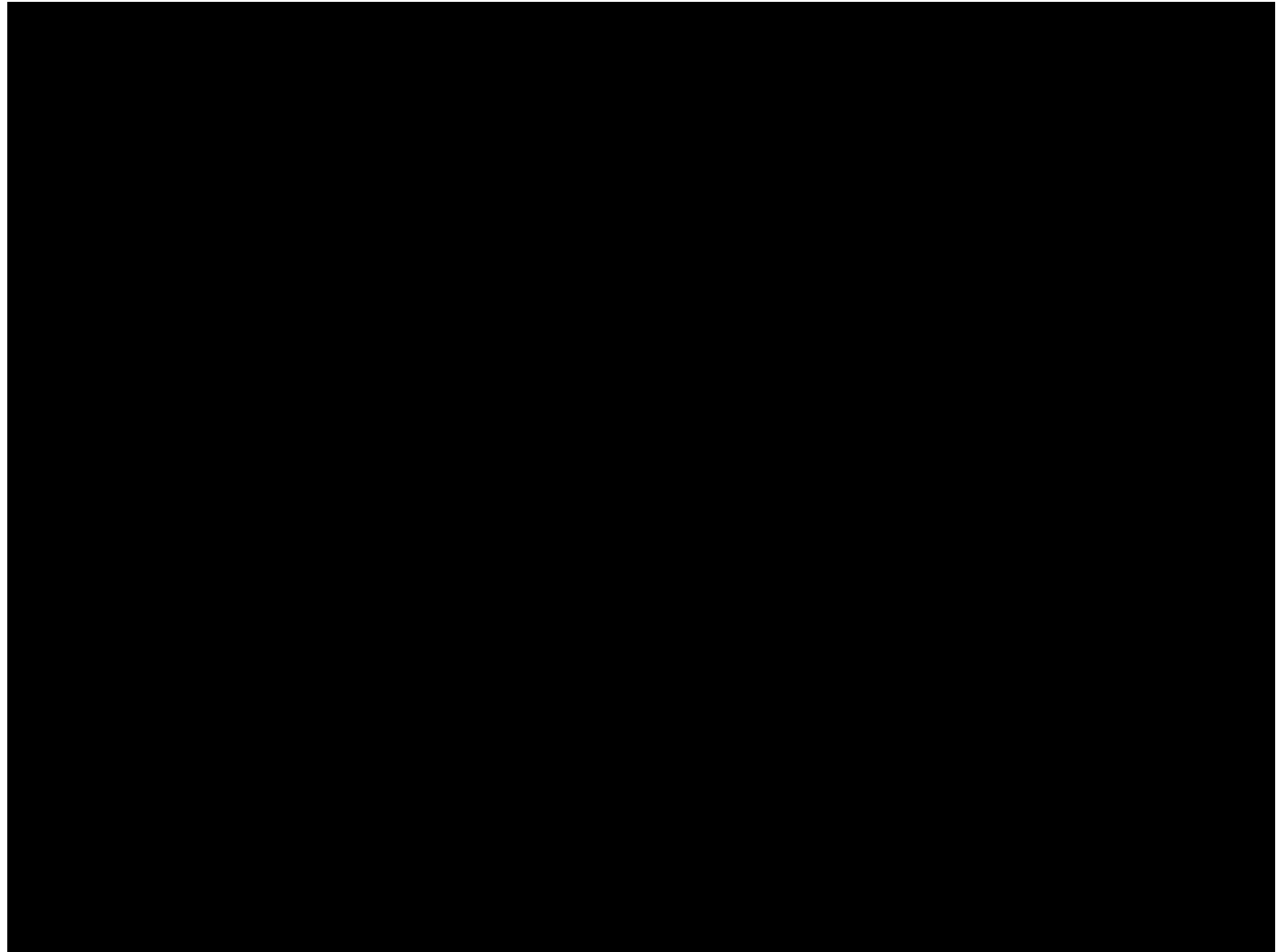
- Free Scenarios views – Scenario Info & Player



- Locked Scenarios views



IVY Virtual World – Second Life Videos - II



IVY VE – Administrator's Panel I

- The management console allows Content Administrators to easily populate the scenario database and create XSPF playlists.
- New scenarios are created through a **form**, where administrators provide textual information (title, language combos, participants gender etc.) as well as an **ordered list of the audio tracks** in each scenario.
- Scenario textual info is stored in the DB and XSPF playlists on a separate playlist inventory.
- A separate listing of all the scenarios in the system allows administrators to see which user is currently working on each scenario and also fire-up their SL client and teleport to that location.



IVY VE – Administrator's Panel II

■ Scenario Upload Form

IVY Interpreting in Virtual Reality

Education and Culture DG
Lifelong Learning Programme
Project 511862-LLP-1-2010-1-UK-KA3-KA3MP

Main Menu
Administration
Logout

Scenario Registration Page

Using this form you can create scenarios for the IVY Second Life player. Fill in the form with all the appropriate information associated with each scenario (e.g. Title, Brief, Scene etc), taking care to provide accurate input. You can modify playlists if you make a mistake through the Edit Playlist interface (TBI).

Form
☒ Dialogue ☐ Monologue
 Title
 Code
 Domain
 Scene
 Classroom
 Brief

Administration
 View Users
 Current Users
 Edit Profile

■ Scenario Listing (with Teleport functionality)

IVY Interpreting in Virtual Reality

Education and Culture DG
Lifelong Learning Programme
Project 511862-LLP-1-2010-1-UK-KA3-KA3MP

Main Menu
Administration
Logout

Scenarios
 Add Done
 33 Scenarios found, displaying 1 to 25. [First/Prev] 1, 2 [Next/Last]

Id	Form	Title	Scene	Domain	Languages	Owner	Scene	Edit
1	Dialogue	Arts school	Classroom	Arts, Education, Travel	German English	FREE	TELEPORT NOW	
2	Dialogue	Primary school (informative interview)	Classroom	Some Domain	German English	FREE	TELEPORT NOW	
3	Dialogue	Community dietician (discussion)	Community Centre	Some Domain	German English	FREE	TELEPORT NOW	
4	Dialogue	Traveller Community II (informative interview)	Community Centre	Some Domain	German English	FREE	TELEPORT NOW	
5	Dialogue	Nursing home	Medical	Some	German	FREE	TELEPORT NOW	

secondlife://University of Surrey/141/113/23

Administration
 View Users
 Current Users
 Edit Profile



IVY VE – Preliminary Functional Evaluation

- A **preliminary evaluation** of the current prototype was done by nine **interpreting** and two **virtual world experts**, using talk-aloud, try-out sessions in Second Life, followed by a discussion with the assessor.
- The evaluation focused on the **HUD functionality** and in-world locations.
- The admin panel was not evaluated at this stage; however it has been successfully used, by content administrators, for the past four months to upload scenarios in our system.
- Overall opinion was quite positive and users with very limited experience in virtual worlds, gaming or similar environments felt comfortable using IVY-VE.
- However, a series of limitations of the current system where pinpointed...



IVY VE – Current Limitations

- Some users focused too much on the HUD, **not paying attention to the world**.
- **No sound directionality** and **no visual cues** on who is speaking.
- Interpreters were enthusiastic they have a tool – but does that generates **bias**?
- Lots of comments regarding aesthetics of locations – all participants observed and commented on the quality of locations using photorealistic graphics.
- **No zoning, instancing** and **replication** like in games.
- Limitation on available ‘prims’ affects world **scalability**
- ... and consequently scenario management and execution, actor placement.
- Currently bots are manually placed to required scenarios – nowadays we use many bots and manage locations to cover all gender combinations in our corpus.
- Sound is heard only from the player controller and is not broadcast back to the world – hence observers do not hear it.



IVY VE – Future Work

- Two **evaluation cycles** currently taking place, focused on interpreting students and potential clients of interpreters, attempting to get some feedback on the IVY-VE **usability**.
- Interpreting mode is being enhanced enhanced with a series of **exercises**, both generic to dialogues and monologues, as well as specific to particular scenarios which have an inherit challenge in interpreting practice.
- Enhancement of the current system with dedicated service components to allow **puppeteering** of bots,
- **Use student/client feedback and experience from using IVY-VE to design a new bespoke system...**
- **..while exploring alternative technologies that allow tighter integration with current web-based scenario system**, e.g., Unity and WebGL.



IVY VE – Forthcoming Events

- **Exploiting Emerging Technologies to Prepare Interpreters and their Clients for Professional Practice**, *London*, 23rd November 2012

For more info visit:

Consortium website

<http://www.virtual-interpreting.net/Seminar.html>

...or the Bangor IVY partner website

<http://www.vmg.cs.bangor.ac.uk/IVY/>



Thank you!

