

Expressing agents personality through ambient modalities

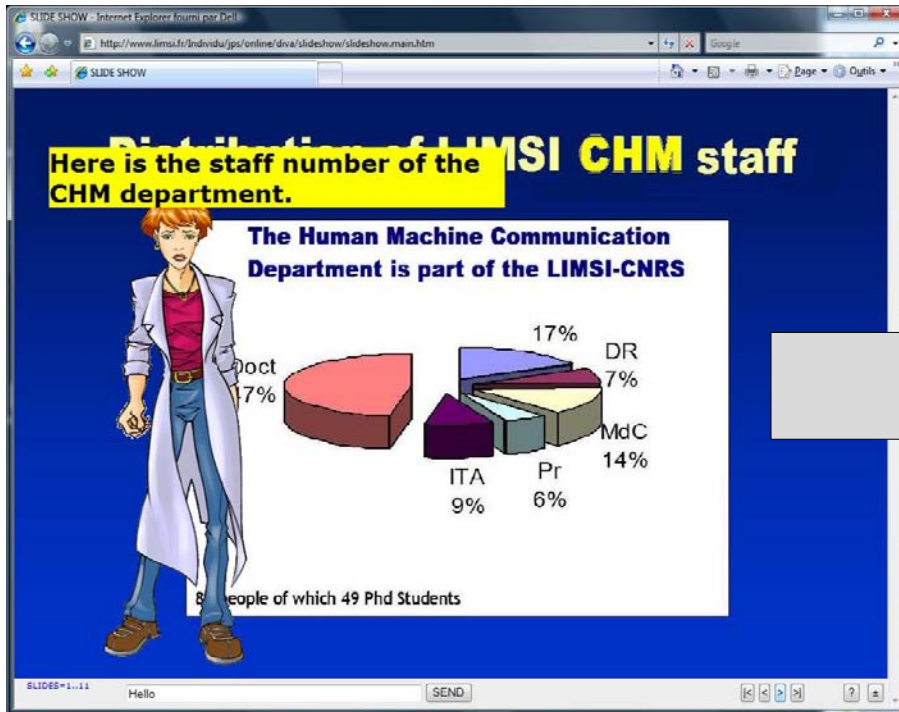
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Outline

- Assistant agents in ambient environments
- DIVA agents in the IRoom project
- The ambient persona problem
- From agent's personality to ambient personality
- Output modalities of the IRoom
- Expression of Emotions and Traits

Assistant agents in ambient environments

Application taken from the DIVA toolkit



Transporting the **Function of Assistance** from (web-based) stand-alone applications to room-based ambient environments will entail new research directions in human/machine communication

DIVA agents in the IRoom project



□ IRoom project

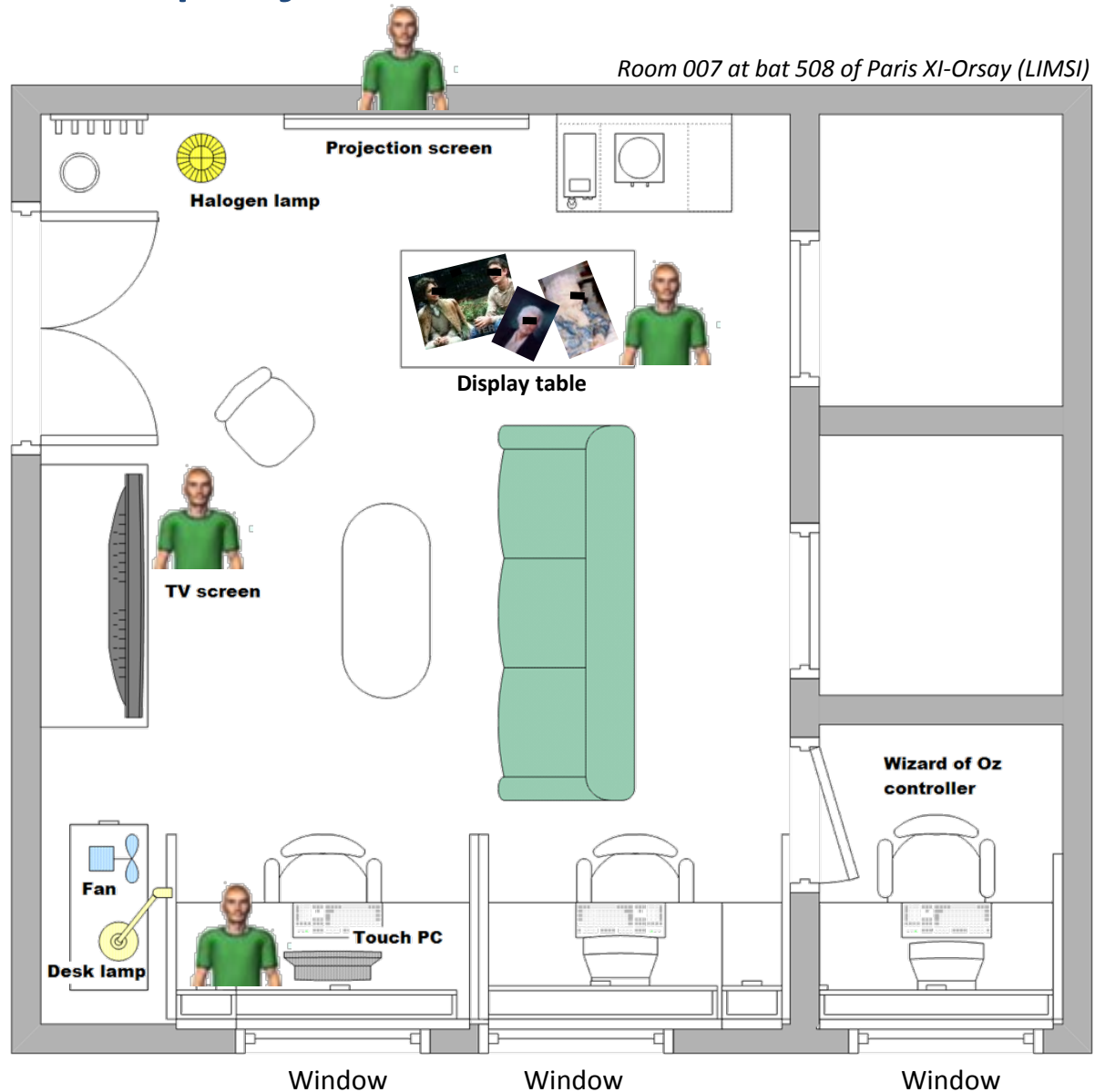
- LIMSI-CNRS, Supélec, Digiteo
- <http://iroom.supelec.fr/wiki>
- Room 007 at LIMSI

□ IRoom devices

- X10, IR-Receiver, Photo Text Viewer (html, picture in web), Speech (Acapela), Voice Recognition, Music and sound player, TV Control (Lowe), KitPhidget (Analog captor, Digital Input, Digital output), RFID Detector, Accelerometer Captor, Positioning system, ...

□ IRoom ECAs

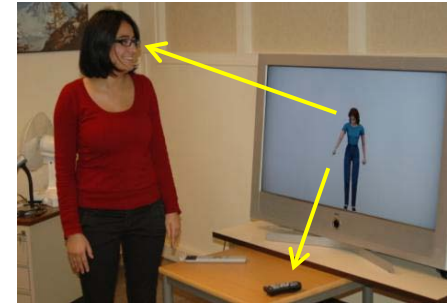
- DIVA: Web Page-based
- MARC: 3D realistic



The ambient persona problem

□ New issues in good old screen-based interaction with ECAs

- Multi-screen issue:
 - Multiple appearances of the same avatar
 - Tracking displacements of the user(s)
- Full-3D deictics in the room:
 - Gazing at the user(s)
 - Pointing object(s)



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□ The persona problem

- What kind of personification for an ambient room ?
 - Human-like: Gender? Role?
 - Abstract: Non human-like? None?
- To express what?
 - **Assistance**: oral natural language interaction (RECO-TTS)
 - **Presence**: the ambient environment is actually perceived as a person by the user(s)



HAL

From agent's personality to ambient personality

□ Literature in Psychology

- **Static** definition of a person: Traits → Cattell's 16 PF, Goldberg OCEAN traits, McCrae NEO PI-R facets, ...
- **Dynamic** approach: Ekman's Six basic emotions, OCC appraisal/coping theories for moods, ...

A simple taxonomy

	Intrinsic	Interpersonal
Static	TRAITS	ROLES (psychological impact)
Dynamic	MOODS (Mind-states, Emotions)	AFFECTS (Mind-states, Emotions)



**Expression of Emotions and Traits through
the output modalities of an ambient**

Output modalities of the IRoom

Table 1: Output modalities of the IRoom.

Character display	<i>also used for information display</i>
Text to Speech	Agents' oral expression
Screens	TV, mural screen, touch PC <i>etc.</i>
Devices	<i>producing an output effect</i>
Air control	fan, heater, cooler*, scent dispenser*
Light control	lamps, electric curtains*
Sound control	music loudspeakers, alarms
Static appliances*	coffee-machine, cooker, fridge <i>etc.</i>
Robots	autonomous moving machines
Atmosphere	<i>main components</i>
Luminance	level, color (hot, cold, red, green...) and dynamics (waves, flash)
Music (<i>backgd</i>)	level and mood (chill, cheer, sad...)
Alarm	level, type and dynamics (bip, honk...)
Temperature*	level
Scent*	level and theme (spring, gas, sweat...)
Devices	force and specific action

*Not yet implemented.

Expression of Emotions and Traits

Table 2: Expression of emotional states.

Ekman's basic emotions

Mental states	Luminance	Music	Alarm	Temp.	Scent	Device
None	= neutral	= chill	0	=	0	= unspecified
Joy	+ hot	+ cheer	0	=	+ spring	+ Robot.move
Sadness	- cold	- sad	0	-	0	- Robot.move
Fear	+ red <i>blink</i>	0	+ danger <i>rep</i>	+	+ gaz	+ Robot.hide
Surprise	+ neutral <i>flash</i>	0	+ oops <i>once</i>	=	0	0 Robot.stop; Fan.stop
Anger	+ red	+ harsh	+ rap <i>rep</i>	+/-	+ sweat	+ Fan.run
Disgust	- Gloomygreen	0	0	-	0	= unspecified

0 is none = is neutral (as set by user) + is higher than neutral or none (- is lower) rep is repetitive.

Table 3: Influences of *lazy* on four actions.

Ambient Actions

Actions	Rebuke	Altern.	Partial	Slack
Open curtains	too shiny!	lamp on	yes	yes
Play music	.	.	yes	.
Set timeout	.	post it	.	.
Clean floor	bag full battery low	.	yes	yes

← Four influence operators

Personality trait:
'lazy' ∈ OCEAN/NEO PI-R

Conclusion

□ An open issue

- The persona problem in ambient situations is an open issue
- Do we really need to impersonate the ambient as an agent?

□ Results

- Ambient environment provide a large amount of (new) output modalities
- That *could* be used to express emotions and traits of the agent

□ Things to do

- Implementation of abstract personifications in the IRoom
- Evaluation of their perceptive effects upon subjects
- Build experiments to contrast human-like vs abstract personifications