Understanding the potential of virtual environments for improving C2 performance

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Outline

- Background
- Can VE improve performance?
- Initial experiment and analysis
- Aspects of VE leading to improved performance
- Current experimental approach
- Next steps

Background

- ELICIT: multiplayer online game
  - —Counterterrorism intelligence domain
  - —Like game *Clue*: ID fictitious terrorist plots
- Used for C2 experimentation
  - —Examine org forms, learning, trust, culture, others
  - —Very thin, textual interface
- Interested in extending into immersive VE

What is a Virtual Environment?

- Customizable platform for interaction
- Synchronous and persistent network
- People are represented as avatars
- Flexibility of usage

Virtual environment “Second Life”

Design elements to support Neutral Valence

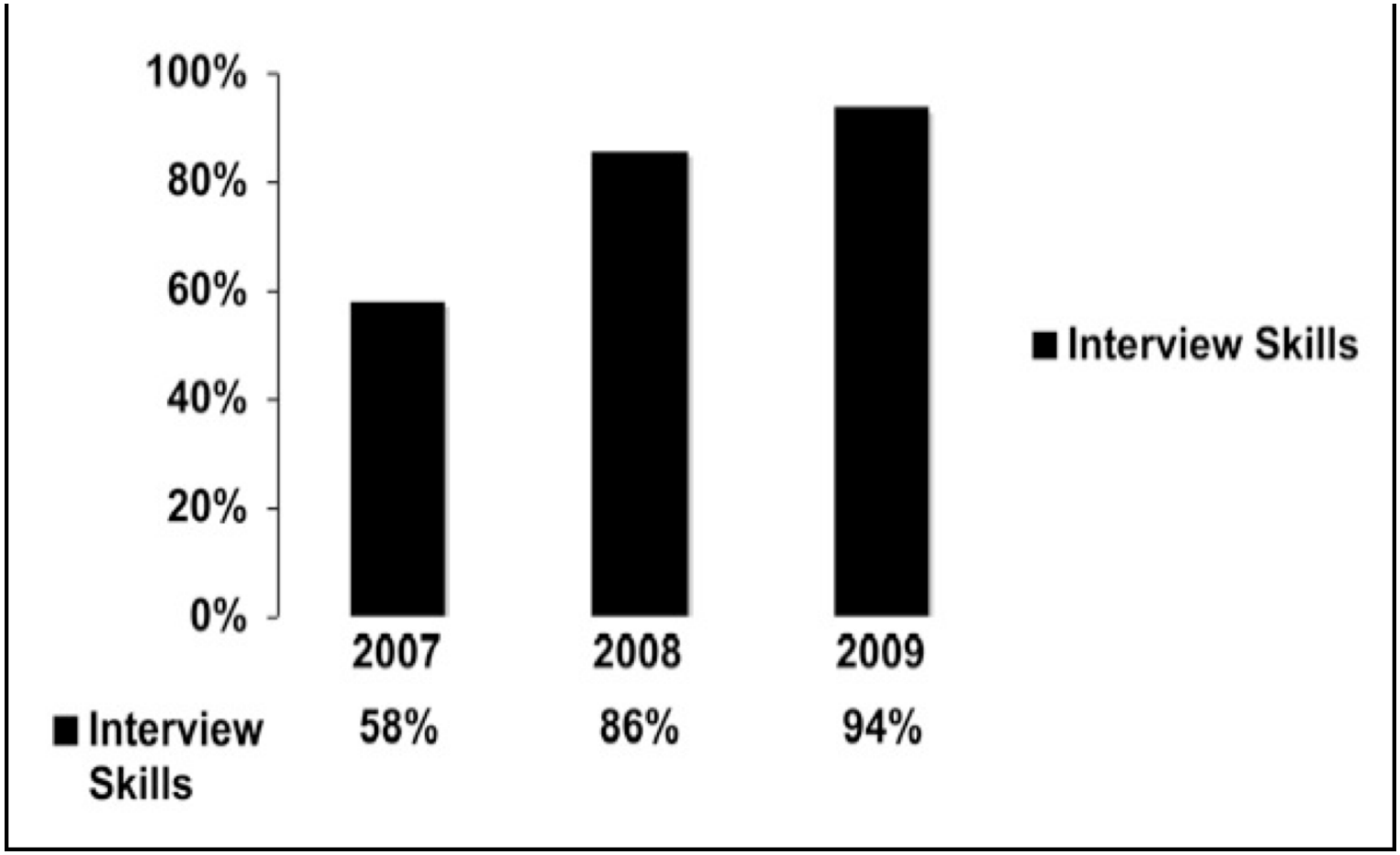
- Interior space only free from natural world complexities
- Subtle texturing of spaces
- Constant ambient lighting
- Narrow range of environmental stimuli

Neutral space prototype

Can VE improve C2 performance?

Canadian border simulation

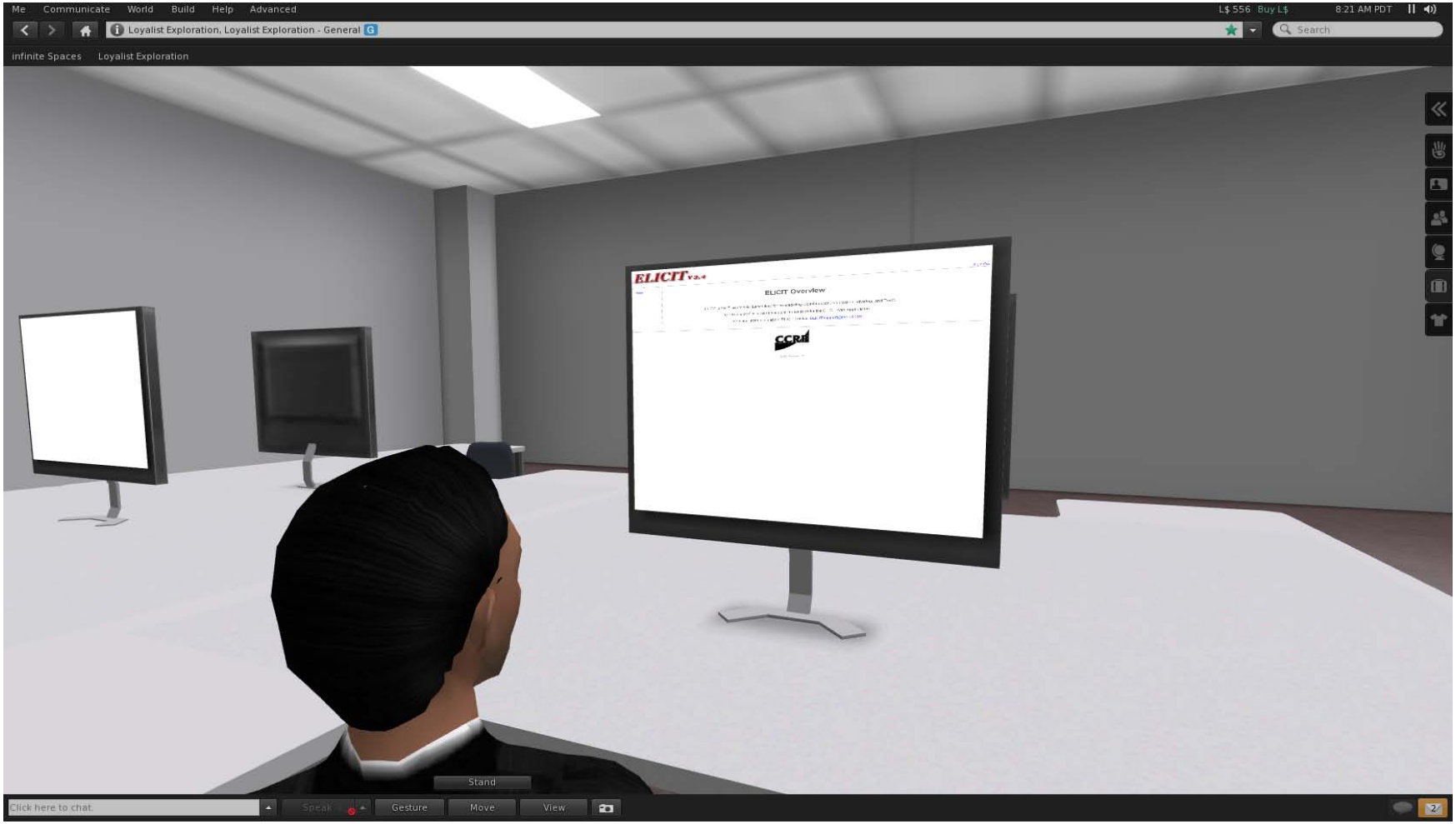
Border simulation results



Initial experiment

Hybrid Room

Second Life Viewer 2.0



Participant perspective

ELICIT results FTF vs. CM

Variable	Mean	N	Standard Deviation	Standard Error
ID Time CM (in seconds)	2685	14	219	58
ID Time FTF (in seconds)	**2554**	14	279	74
Who Score CM	.140	14	.363	.097
Who Score FTF	**.790**	14	.426	.114
What Score CM	.321	14	.249	.066
What Score FTF	**.536**	14	.365	.098
Where Score CM	.570	14	.514	.137
Where Score FTF	**.790**	14	.426	.114
When Score CM	.262	14	.297	.079
When Score FTF	**.333**	14	.320	.086
Identify Composite CM	.324	14	.206	.055
Identify Composite FTF	**.610**	14	.327	.087

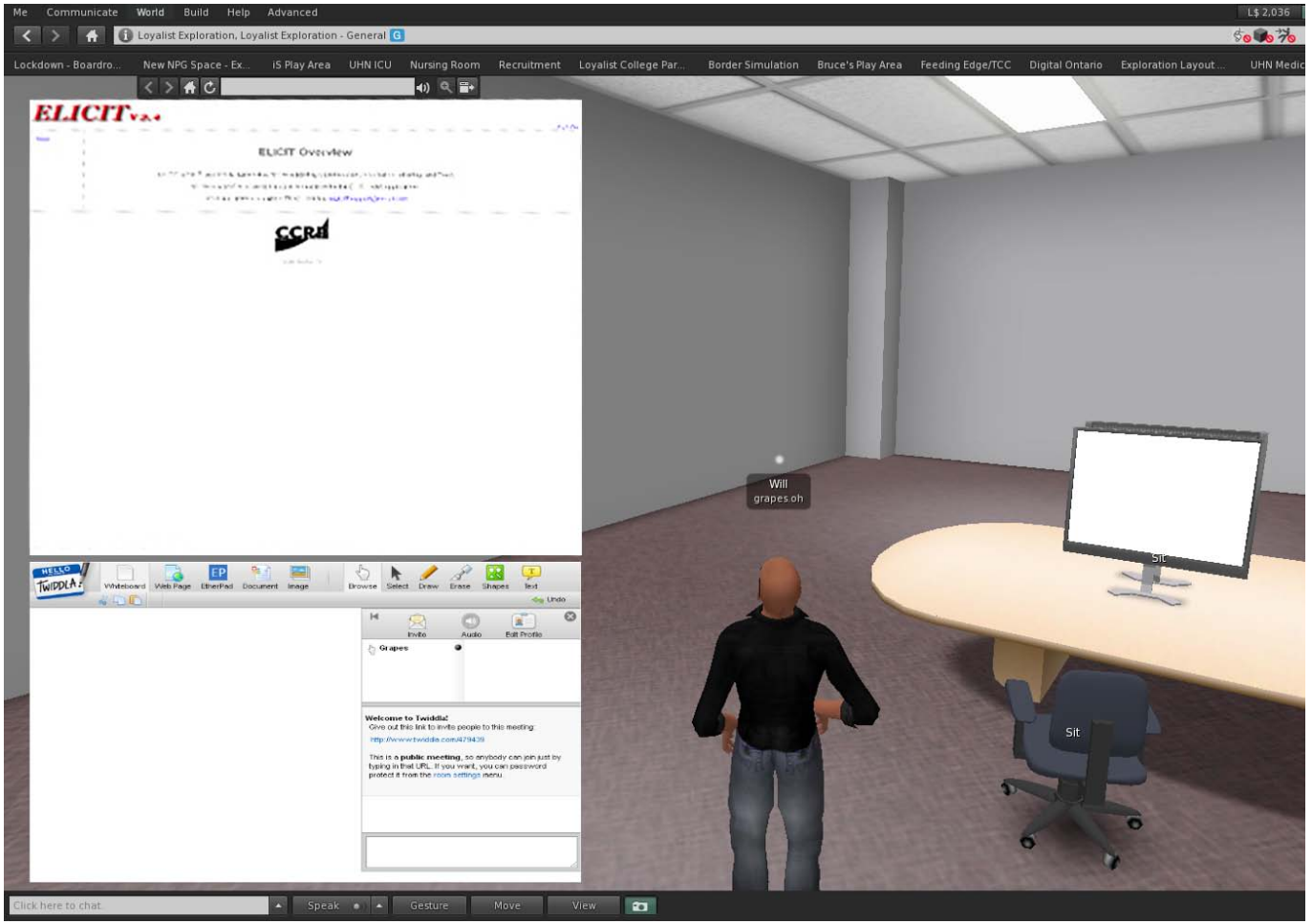
Aspects of VE leading to improved performance

- Participant centered experience
- Contextually situated learning
- Fully utilize VE style of interactions
- Identification of self with avatar
- Sense of being in environment (presence)
- Sense of sharing environment with others (co-presence)

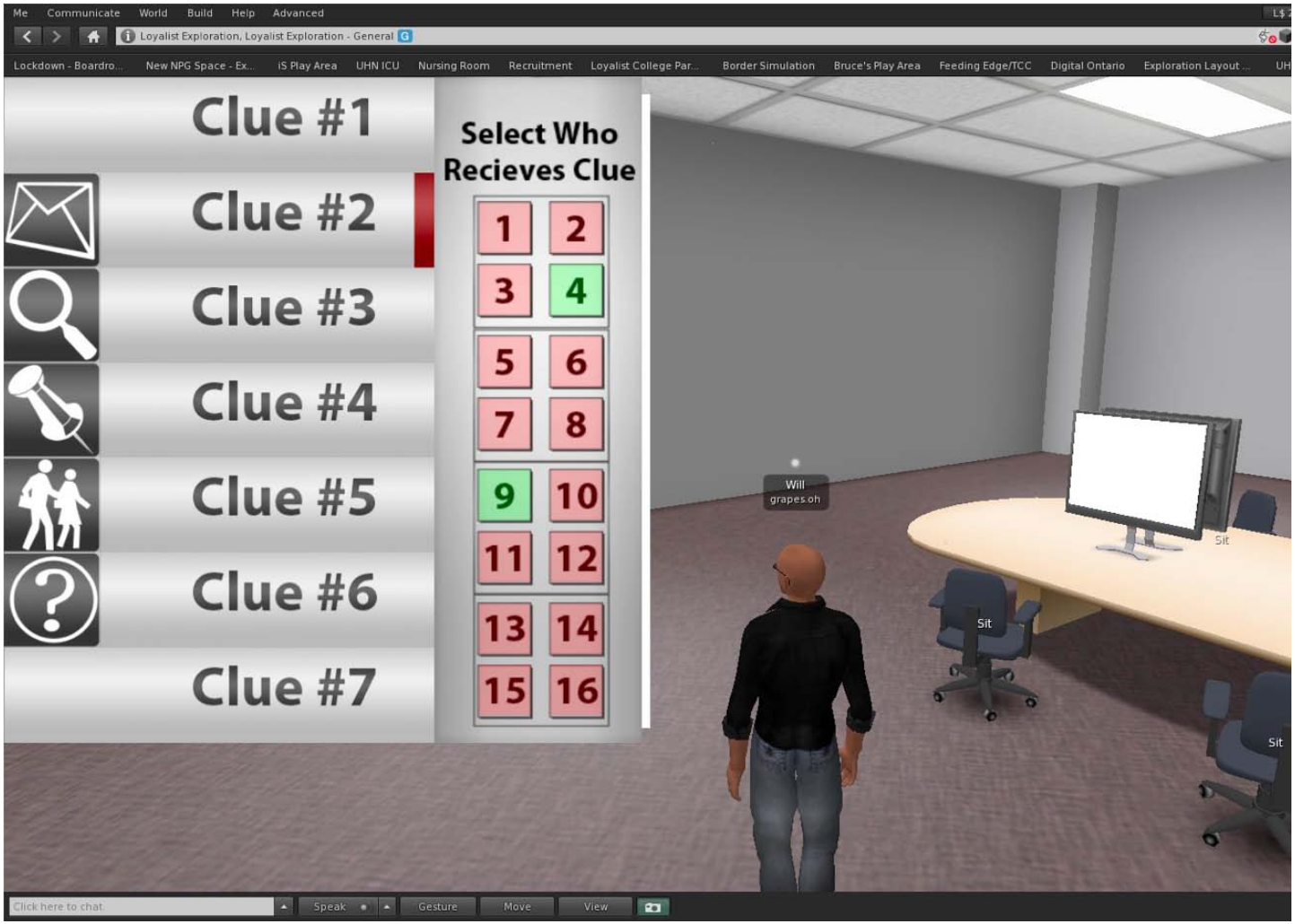
Current experimental approach

- Seeks to harmonize native attributes of virtual environments that lead to enhanced performance by augmenting user interface and allowing for a broader range of interactions than the initial experiment.

ELICIT in HUD



‘Paper’ clue version of ELICIT



Next steps

- Proceed with experimentation with ELICIT game-play through HUD
- Enhanced experimentation using ‘paper clue’ version of ELICIT in both F2F and CM
- Explore potentialities of integrated abELICIT within virtual environment