VREMOTE

using interaction in a virtual environment as a technique to elicit emotion

goals

1) create a Virtual Environment (VE) which can manipulate the amount of interaction between the participant and the environment (through varying levels of interaction).

2) create a believable AI in the VE that reacts to the participant's actions by dynamically altering the environment or the AI's behavior.

dev

developed with unity game engine, built following the user-centred design (UCD) paradigm

testing

open form emotional questionnaire and expert VR heuristic evaluations

FEAR

control a boat surveying canals in a dark sewer, stalked by a monster
by jordan taschner

SADNESS

bond with a puppy, but be met with a deeply saddening incident
by brent van der walt

levels of interaction

base
| no control over boat
| no virtual hands
| no torches
| no radar device
| limited AI, monster uses visual cues to scare.

mid
| speed of boat control, no navigation
| virtual hands
| torch interaction
| no radar device
| simple pathfinding, limited AI

advanced
| full boat control, speed, direction
| virtual hands
| torch interaction
| radar device
| All AI, advanced monster, VE AI

results

evaluation

problems with severity > 3 were fixed near the end of development.

Heuristic	Problem	Frequency
Realism	Virtual hands do not accurately follow actual movement of hands	3
Interaction	Paddling motion unnatural	2
Interaction	Speed of boat hard to control	1
Realism	Unrealistic monster behaviour at times	2
Realism	Fear elements should be left out of tutorial and menu	1
Realism	Could not reach the torch when I should be able to	1
Simulator sickness	Jerking of the boat induced sickness	2
Interaction, agency	Boat rocking and path switching not effective enough	1
Consistency	Menu button ray casting	1

performance

the VE performed optimally on a near-low tier VR system, allowing optimal comfortability for the user.

Framerates
min: 88, max: 90
min: 71, max: 75
min: 53, max: 62

questionaire

results of the emotional questionnaire indicated that the VE is fit for future studies, and is capable of eliciting tension and fear in the user. Highlight interactive elements include the monster and torches.

levels of interaction

base
| hand models
| no choice of puppy
| no tennis ball at vet

mid
| selection of puppy
| navigation
| multiple interactions with objects
| dig up teddy bear

advanced
| hand gestures
| stroking
| butterfly interaction
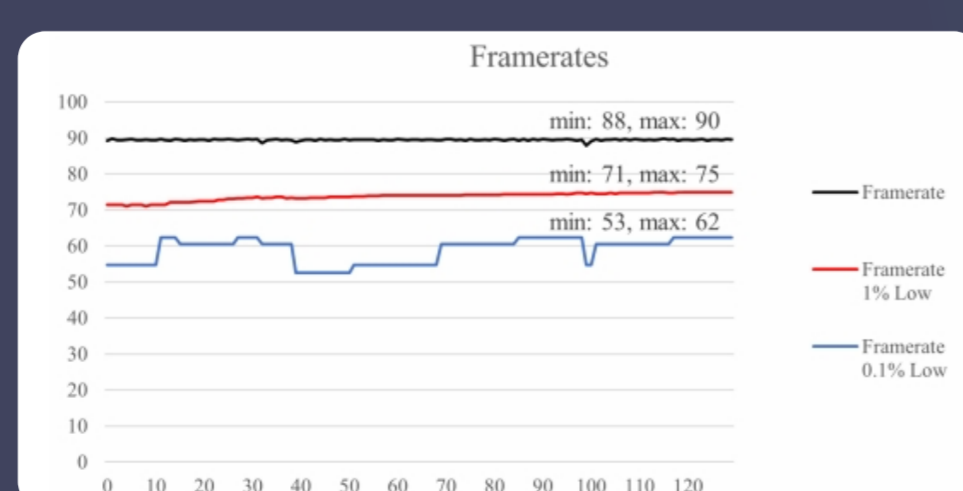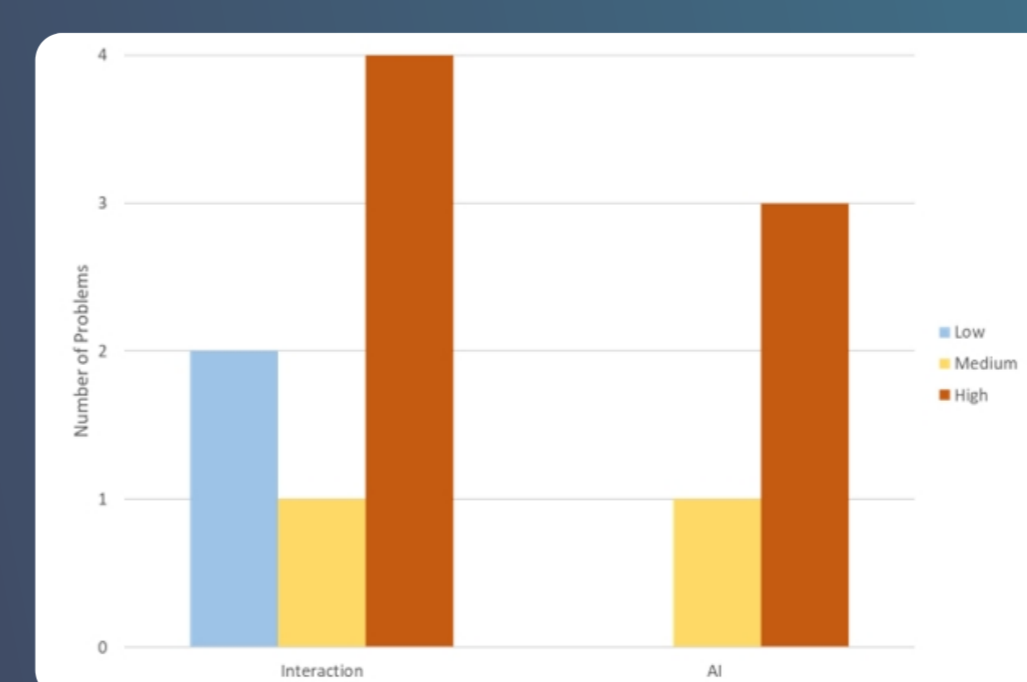| stroke dog after incident
| handed teddy bear at vet

results

evaluation

Of the 23 problems, 11 were caused by the interaction and AI features. Of the seven interaction issues, the two low severity issues and one of the high severity issues were resolved post-testing and all three of the high severity AI issues were resolved.

questionaire

The open questions revealed that the environment worked as expected with certain interactions having an effective influence in evoking emotion and forming bonds with the pet. These indicated a clear increase in sadness after the experience.

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