



MULTIMODAL INTERFACES
PROJECT: **CHALLENGER 1**



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INTRODUCTION

- **GAME**

Space Invaders: is an arcade video game designed by Tomohiro Nishikado, and released in 1978.

http://en.wikipedia.org/wiki/Space_Invaders

- **ARCADE GAME**

The aim is to destroy the five rows of aliens as they move horizontally across screen and the Mother ship passing on top of screen at random time.



PROJECT IDEA

- **WE WERE FANS OF THE GAME**

The three of us have played this game as kids in the old consoles.

- **UPGRADE THE GAME WITH GESTURES AND VOICE RECOGNITION TECHNOLOGY.**

operate the airplane by voice recognition.

operate the airplane by gesture recognition.

already implemented operation by keyboard



HARDWARE

- **Personal Computer with i7 processor and 6GB RAM**
- **Kinect Device**
Optimized for PC



SOFTWARE

- **Windows 7 operating System**
- **Visual Studio 2010 Express**
- **Kinect SDK**
- **Microsoft Speech SDK**



MODALITIES

- **Touch**
 - Captured by computer keyboard
 - Triggers: movement and fire
- **Voice (Speech)**
 - Captured through built in microphone array in Kinect device
 - Triggers: movement and fire.
- **Gesture**
 - Captured by Kinect Cameras
 - Triggers: movement and fire

DESIGN

- HOW WE DESIGNED DIFFERENT MODAL INTERFACES?
- COMPLEMENTARITY
 - left hands above head + say “rocket”. This action will fire a rocket.
- REDUNDANCY
 - say “left” or “right” + press “left” or “right” keys
 - hand move left or right + press “left” or “right” keys
- CONCURRENCY
 - Hand move left or right + say “fire”
 - say “left” or “right” + press space to fire
 - press “left” or “right” keys + say “fire”

CASE

- **Gesture and voice in order to fire a rocket.**
 - **SYNERGISTIC**
- **Gesture and voice where one modality can be used at a time to move left and right.**
 - **ALTERNATE**
- **With gesture we move left and right and with voice we fire a bullet.**
 - **CONCURRENT**

		USE OF MODALITIES	
		Sequential	Parallel
FUSION OF MODALITIES	Combined	ALTERNATE	SYNERGISTIC
	Independent	EXCLUSIVE	CONCURRENT

CARE

- **COMPLEMENTARY**

Combination of gesture and voice to fire a rocket

- **REDUNDANCY**

touch and gesture or touch and voice

combinations used to trigger the actions in parallel or sequential.

- **EQUIVALENCE**

touch, gesture and voice

all these modalities can trigger actions of the game

USER EVALUATION

- **DESCRIBE THE COMANDS TO THE USERS**
- **LET USERS PLAY TO LEARN COMANDS**
- **PLAY THE FINAL GAME**
- **NOTE DOWN THE RECORD ANG HIGHEST SCORE**
- **GET BACK THE REPORT FROM PARTICIPANT**

RESULTS

- COMUNICATION WAS VERY IMPORTANT
- IT IS VERY EASY TO PLAY THE GAME WITH KEYBOARD
- PARTCICIPANTS ALSO LIKED THE GESTURE RECOGNITION
- SPORT ACTIVITY
- VOICE RECOGNITION RANKED WITH A LOWER GRADE

Nobody didn't find it easy to play the game with voice

- EVERYBODY HAD FUN

CONCLUSION

- Upgrading the game with the newest technology was interesting and fun.
- Learning new modalities except keyboard and mouse.
- Not very impressed from voice recognition in this case.
- User Evaluation

Time consuming for programmers

Everyone had fun

GAMES ARE FUN

VIDEO DEMO

THANK YOU



ANY QUESTIONS ?