GSET Somi: A Game-Specific Eye Tracking Dataset for Somi

Hamed Ahmadi[1]

Saman Zadtootaghaj[1]

Sajad Mowlaei[1]

Mahmoud Reza Hashemi[1]

Shervin Shirmohammadi[1,2]

[1] Multimedia Processing Laboratory (MPL), School of Electrical and Computer Engineering, College of Engineering, University of Tehran

[2] DISCOVER Lab, School of Electrical Engineering and Computer Science, University of Ottawa

University of Tehran
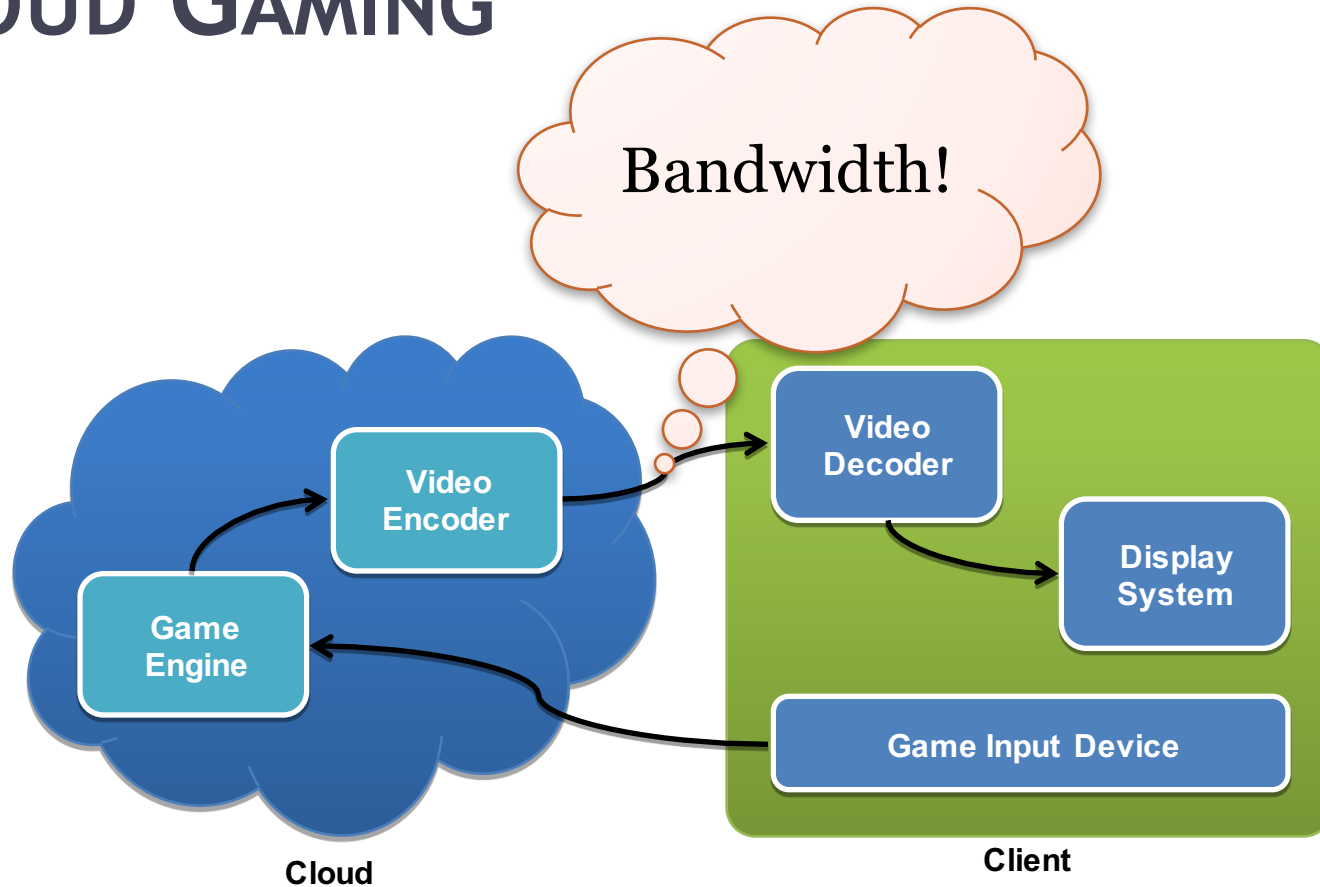
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DISCOVER Lab
www.discover.uottawa.ca

Gaming Industry

- Wide range of gaming devices
- Gaming will hit $91.5 billion this year[1]

1 http://www.gamesindustry.biz/articles/2015-04-22-gaming-will-hit-usd91-5-billion-this-year-newzoo

Cloud Gaming

BANDWIDTH CHALLENGE

- Currently requires ~5Mbps per player

- Perceptual video coding is used to reduce bit rate while preserving perceived quality!

- Specific eye-tracking datasets are required to build specific perceptual models for gaming applications.

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COMPARISON OF THE GAME-RELATED EYE-TRACKING DATASETS

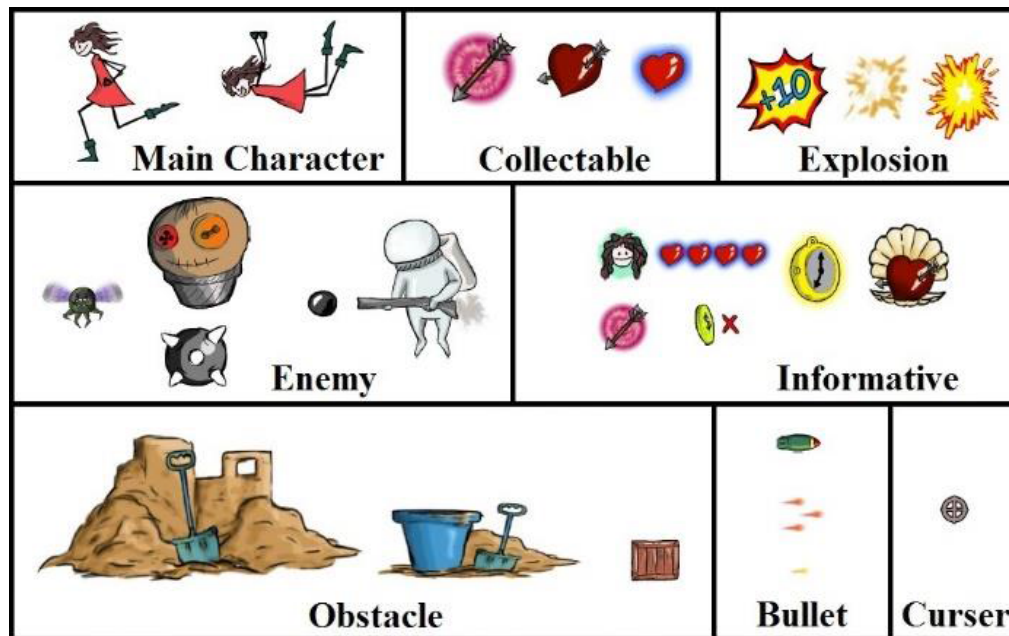|	GSET	PETERS	BORJI	CRCNS	DIEM
Collected while playing	●	●	●	○	○
Collected while watching	○	○	○	●	●
Game video	●	●	●	●	○
Game video trailer	○	○	○	○	●
#Subjects*	84	5	21	8	-
#Videos*	135	24	27	-	4
Resolution	720p	680x480	680x480	680x480	Varying
Video format	Raw	Raw	H.264/AVC	MPEG-1	-
Eyes	Both	Right	-	-	-
Eye-tracker	Remote	Chin rest	Chin rest + Head mount	Chin rest	-

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VIDEO GAME

- Title: "Somi, My Beautiful Doll"
- Game Genre: Side-scrolling
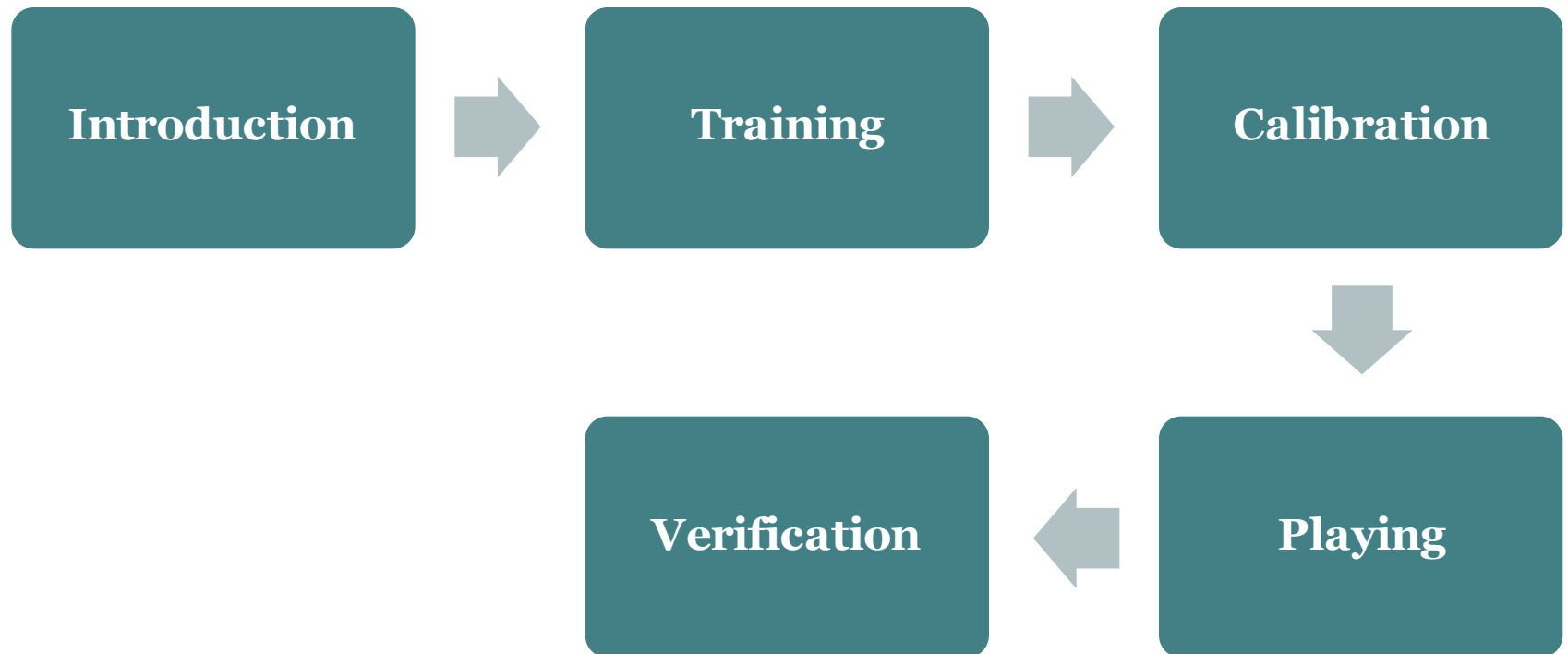- Built by: GameMaker Studio
- Resolution: 720p

SOMI's Game Objects

- Categorized into eight groups

DATA COLLECTION PROCEDURE

```
Introduction  →  Training  →  Calibration
                                    ↓
Verification  ←  Playing
```
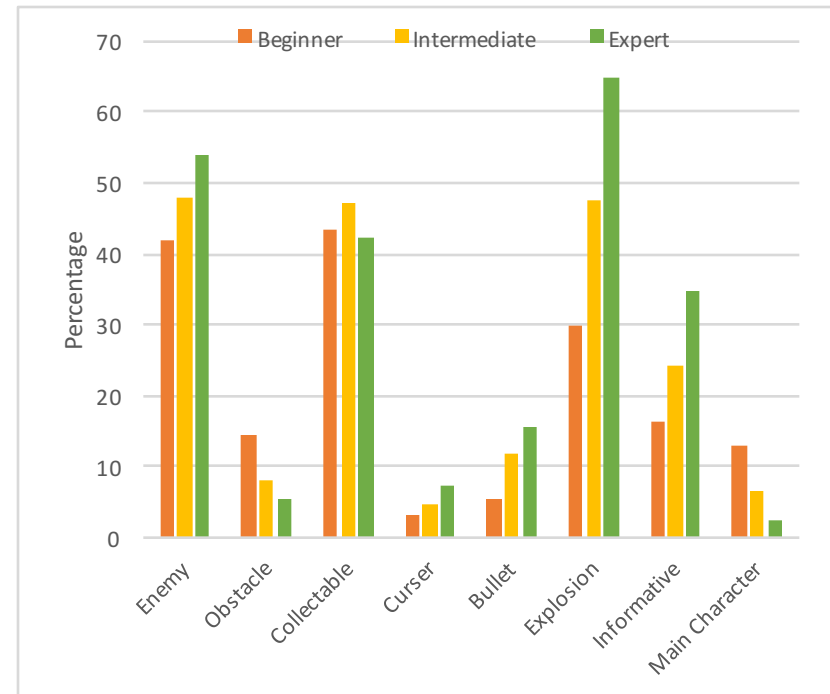
Eye-tracking Device

- Tobii X2-30 Compact
  - Remote eye-tracker
  - Sampling rate of 30 Hz
  - Accuracy of 0.4°

Sample Results 1

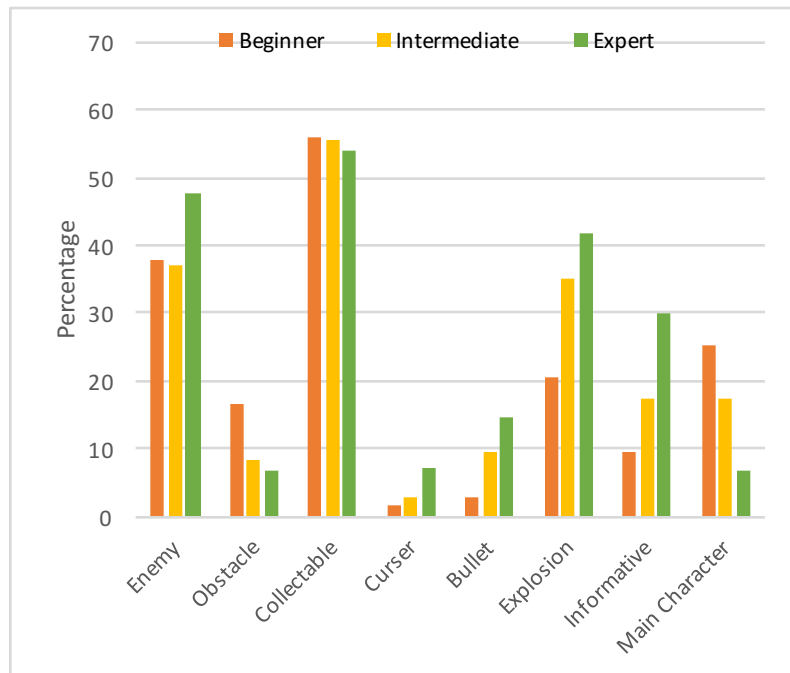- Attention patterns are different among players of different skill levels

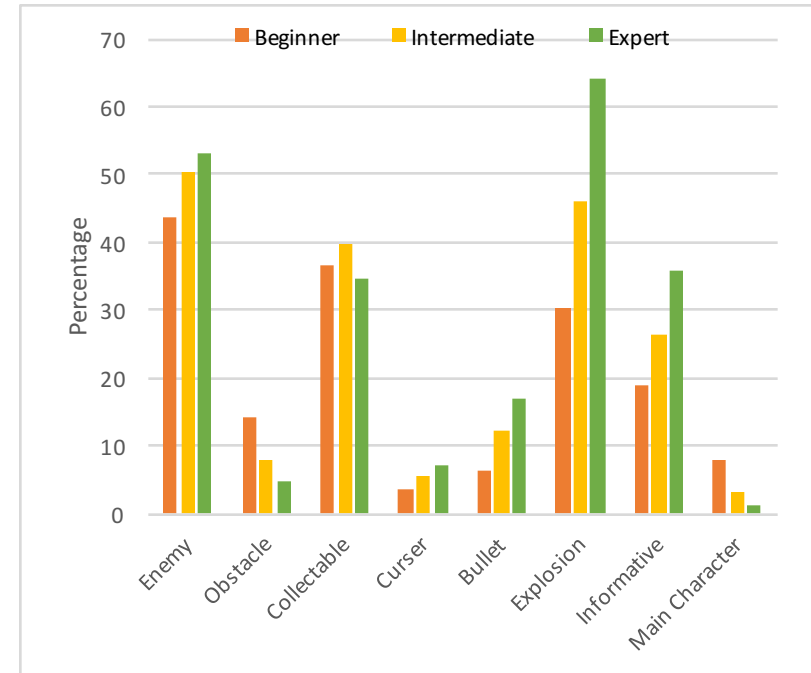| Skill Level	Score Range
Beginner	score <= 1000
Intermediate	1000 < score <= 6000
Expert	6000 < score

Average attention per category

Sample Results 2

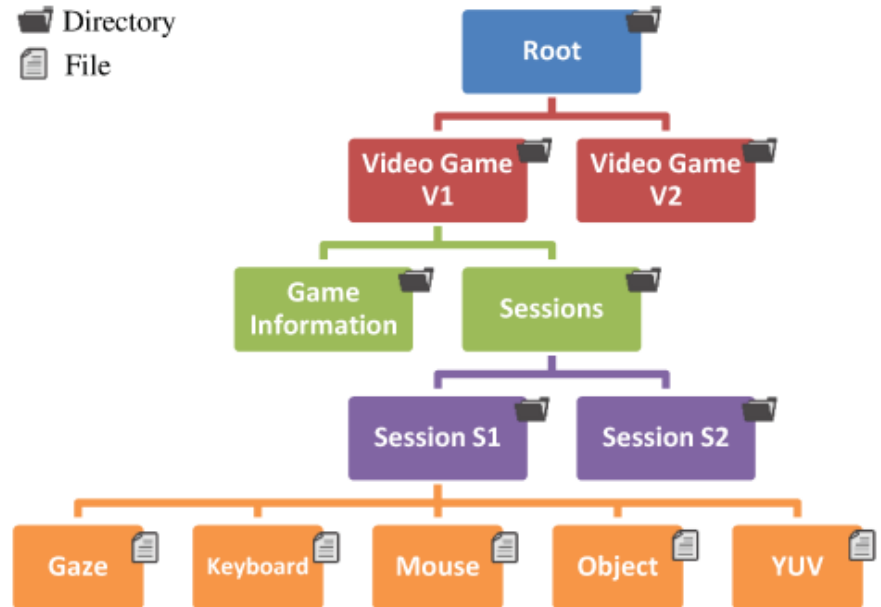- Attention patterns are different during different game states

Average attention per category in Jumping state

Average attention per category in Running state

Dataset Structure

- Each session contains
  - Gaze records
  - Keyboard strikes
  - Mouse info
  - Game objects' info
    - Size
    - Location
  - Gameplay video
    - In a lossless format

http://www.site.uottawa.ca/~shervin/gaze/

Conclusion

- Compared to existing datasets, ours has the following features at once:
  - HD resolution
  - Collection during gameplay instead of watching
  - Recording of mouse and keyboard inputs
  - Recording of game objects' locations
  - A large number of subjects
- Can be used to recognize the different attention patterns among players

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FUTURE WORK

- Adding more video games of the side-scrolling genre
- Adding video games of the other game genres

THANK YOU FOR YOUR ATTENTION