The Secret of Magic VR Game


The Secret
Of Magic

OVERVIEW

- A VR game that is inspired by: Harry Potter and the Philosopher’s Stone (2001)
- Project goal: Connect VR Game with deep learning mechanism
- Player’s goal: Defeat all enemy waves using spells which are triggered by player’s drawn glyphs

SYSTEM

- Running platform: PC
- Equipment required:
  - HTC Vive headset
  - HTC Vive controller
- Developed using Unity

Game Overview

- One scene - 360° arena
- Player should draw one of the predefined glyphs (below)
- Each glyph triggers a different spell

Game Overview (Cont.)

- Undead enemies die on hit
- Player get points for every killed enemy
- Difficulty is raised as the game progress (movement, #enemies, directions)
- The game is over when an undead reaches the player
- Starting on wave 4 the game change to dark environment

Dark environment

GAME IN-DEPTH

Deep Learning

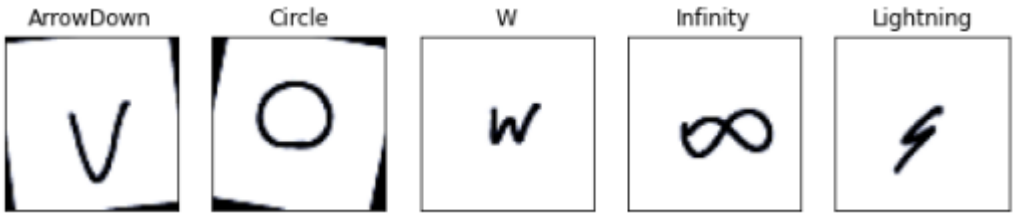
- Initially we wanted to use transfer learning
- Using a trained model gave medium results (70% accuracy)
- After research, we chose to build a Convolutional Neural Network
- End result: 90.196% accuracy

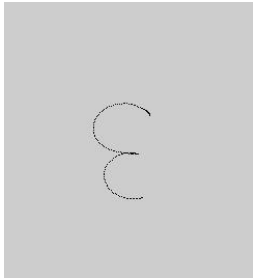
Convolutional Neural Network Overview

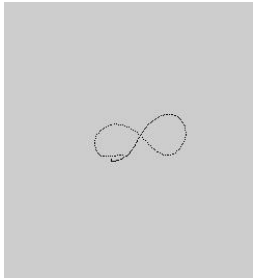
- Architecture:
  - Two convolution layers
  - 4 FC layers.
  - ReLU & MaxPool activation
- Input dimension (image) 3x32x32
- Output dimension (prediction) 1x8
- Number of parameters in the network: 38,523,912

Classifier Training

- Model was trained from in-game drawn glyphs
- 307 drawings database
- Database was split into train and test sets
- The train set was expanded by augmenting the images (scaling and rotating)







Test results

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test accuracy: 90.196%
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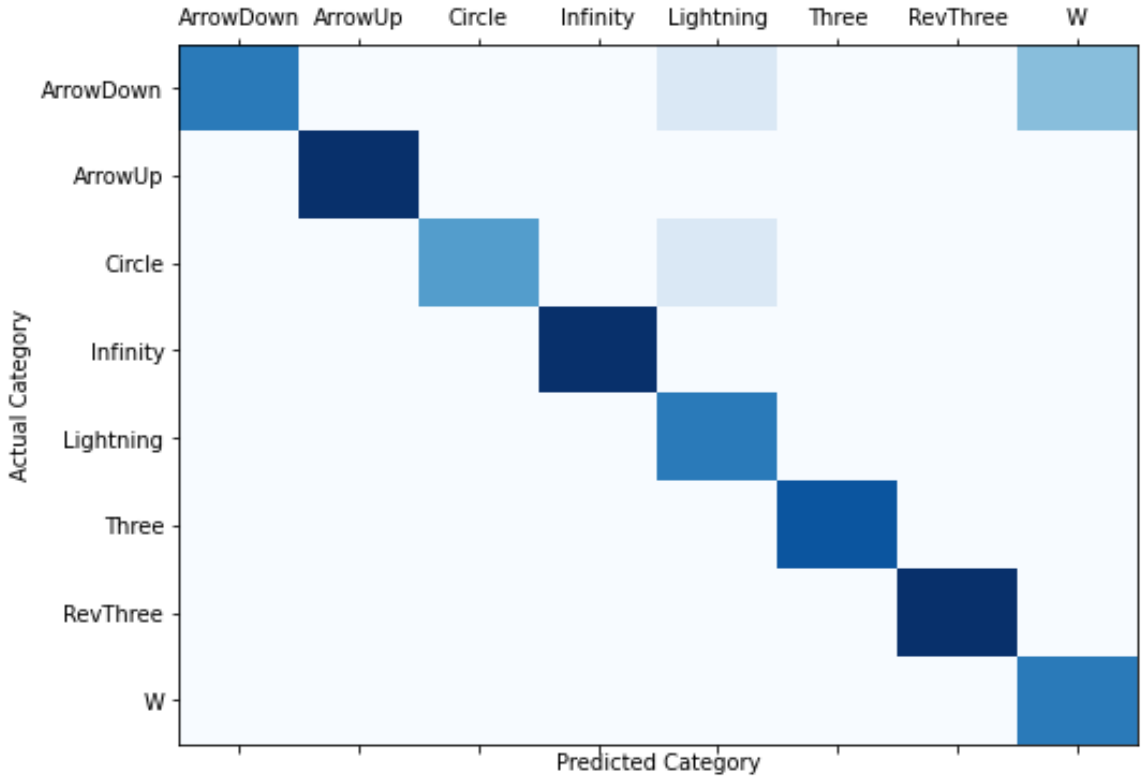

Effects Manager

- Using Realistic Effects Pack v4 asset
- Instantiate spells
- Spell lifetime timer

Gestures Manager

- Collects the player drawn data
- Creates an image by transferring world point to screen point
- Encodes it to JPG
- Starts a python process on another thread

SCORING SYSTEM

- Each undead enemy killed worth 50 points
- Player high score is saved between games

LINK TO GAMEPLAY OVERVIEW

Click here!

CREDITS

- Supervised by Yaron Honen and Boaz Sternfeld
- Oran Shuster for consulting and designing the logo
- Developed by Amit Shuster & Michal Guttmann

Special thanks to all the people who played and commented

THANKS!

Any questions?