Writing in thin air

Hello!

The Manhattan Project

Objective at Hand

- Create a motion-based handwriting recognition system
- Eliminate the need for a writing platform

> Any sufficiently advanced technology is indistinguishable from magic
>
> -Arthur Clarke

1. Description

Let’s start with the first set of slides

Two step process

Obtaining an image

Move a rod with sensors as if you are writing on a 2D plane

Use the readings from the sensors to form an image of the wavy hand motion

Extracting the character

Using neural networks, find the character traced out

Display the result

Big concept Small step

Samsung smartphones had trace typing which was quite popular

Siri voice recognition had a slow start in 2010

Approach towards solving

Read about existing projects of similar nature

Benchmark

Find required sensors

Distribute workload

Implement things we learn

Write the algorithm

Test

Simulate

Debug

Work Distribution

Sensor Modelling

Read different papers and find sensors to our need

Generate readings and remove noise

Feature Extraction

Obtain a 2D image

Use NN to find what is written

Work Done

Read about similar projects

Implemented a NN algorithm on Python

Training the code with images

Difficulties Faced

Most reference papers implemented a 3D version

Training NN was manually intensive

- We scrapped our initial idea due to hardware testing constraints
- Found MNIST data set. We have switched to this

Thanks!

Any questions?

References

- http://cs229.stanford.edu/proj2019aut/data/assignment_308832_raw/26623152.pdf