FX: A magic green stick

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Welcome to FX...

Figure 1: Superhero

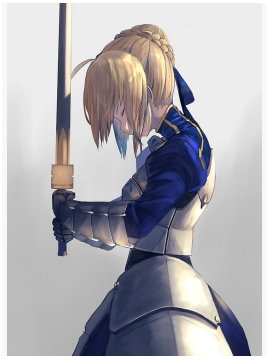

Figure 2: Magic Saber

Figure 3: Computer Vision

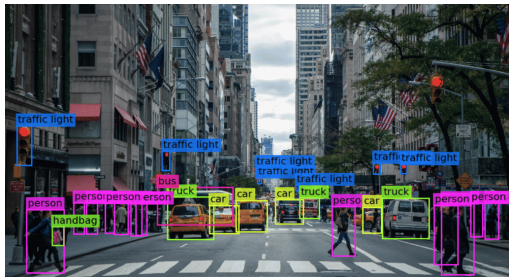

Figure 4: AI Detection

Description

All we need for our project are only a green stick, a computer, and a clean background. You can move the stick in any way and some magic sounds will be made (The volume depends on how fast you are moving). This project is based on computer vision technology, data mining and signal theory.

- demo1 line clustering
- demo2 sounds making

Stages...

1. Color detection
2. Image smoothing
3. Line extraction
4. Line clustering
5. Moving detection
6. Sound making

Stages

- Color Detection
  - Isolate the green part of every frame.

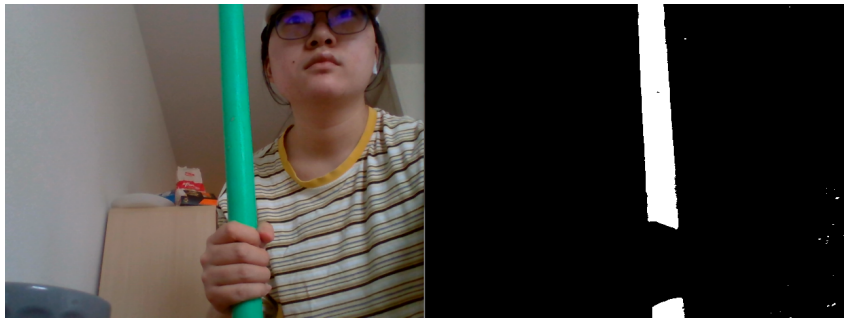

Figure 5: Color Detection

Stages

- Color Detection
  - Isolate the green part of every frame.
- Image Smoothing
  - Smooth the edges of the stick.

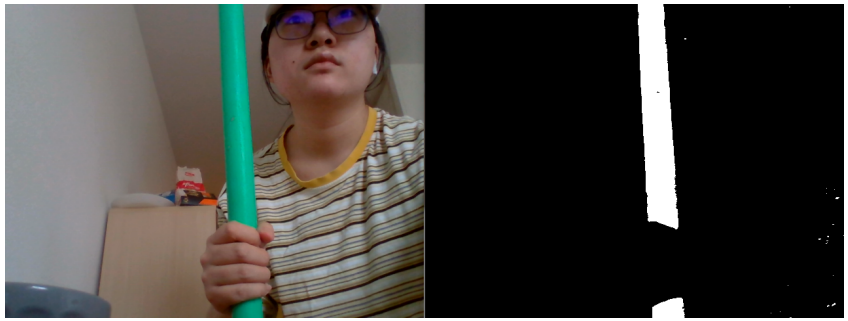

Figure 5: Color Detection

Figure 6: Image Smoothing

Stages

- Line Extraction
  - Extract lines on the edge of green stick.

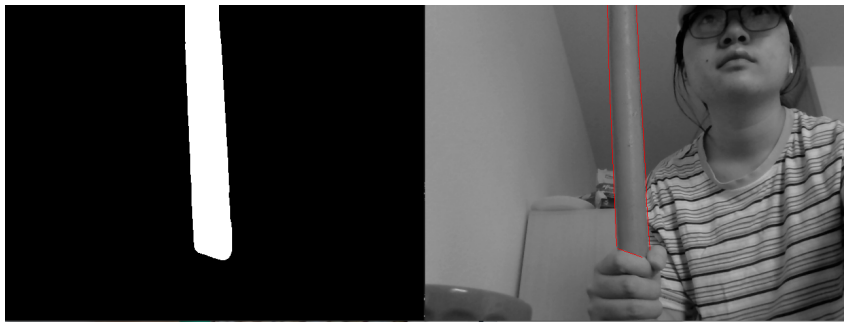

Figure 7: Line Extraction

Stages

- Line Extraction
  - Extract lines on the edge of green stick.
- Line Clustering
  - Figure out two main lines.

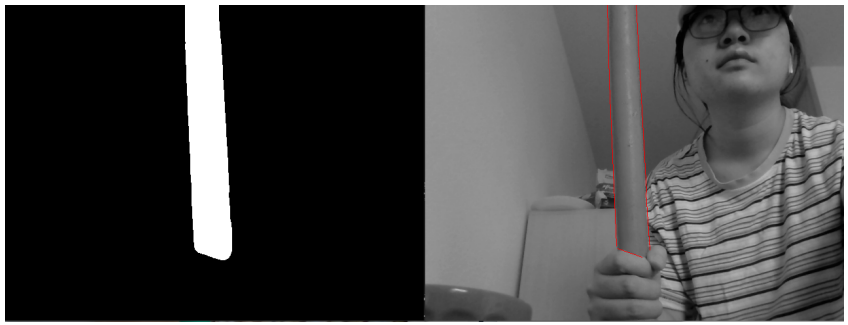

Figure 7: Line Extraction

Figure 8: Line Clustering

Stages

- Moving Detection
  - Define the movement with parameters of the two main lines.

Stages

- Moving Detection
  - Define the movement with parameters of the two main lines.
- Sound Making
  - Play the sound depending on movement.

Application scenario

- Used in the production of movies or TV series
- For motion detection in real life
- Virtual-reality game

To be continue...

- Add laser effect
- Adapt to other target objects
- Set targets and scores

Algorithm and tools

- OpenCV: A real-time optimized Computer Vision library, used to process images (color detection, smoothing, line extraction...).
- numpy: Mainly to deal with arrays, matrix and do some linear computation.
- matplotlib: To display some data in figures.
- sklearn.cluster: To implement DBSCAN and k-means clustering.
- math: To do some basic math computation.
- time: To get running time.

More information

https://github.com/dymanne123/FX

Thank you!