# File structure

| | |
|---|---|
| MControl.cpp | core controller |
| osk-s.exe | small on screen keyboard [demo] |
| osk-m.exe | medium on screen keyboard |
| osk-l.exe | large on screen keyboard |
| monitor.exe | turn monitor off automatically after 5 minute of inactivity |
| zoom.exe | desktop zoom in [demo] |
| hotpad.exe | keystroke and mouse click recorder [demo] |

# Function List

1. **detectAndDisplay**: apply face/eye detection model and update result into camera windows in realtime with following components:

- Red ellipse: reference area
- Purple ellipse: detected face
- Blur ellipse: detected eyes
- Green line: mouse move speed

If the eyes are not detected for 3 second:

- First time: call osk-l (large on screen keyboard)
- Otherwise: switch keyboard size in cyclic order (large -> medium -> small -> large -> …)

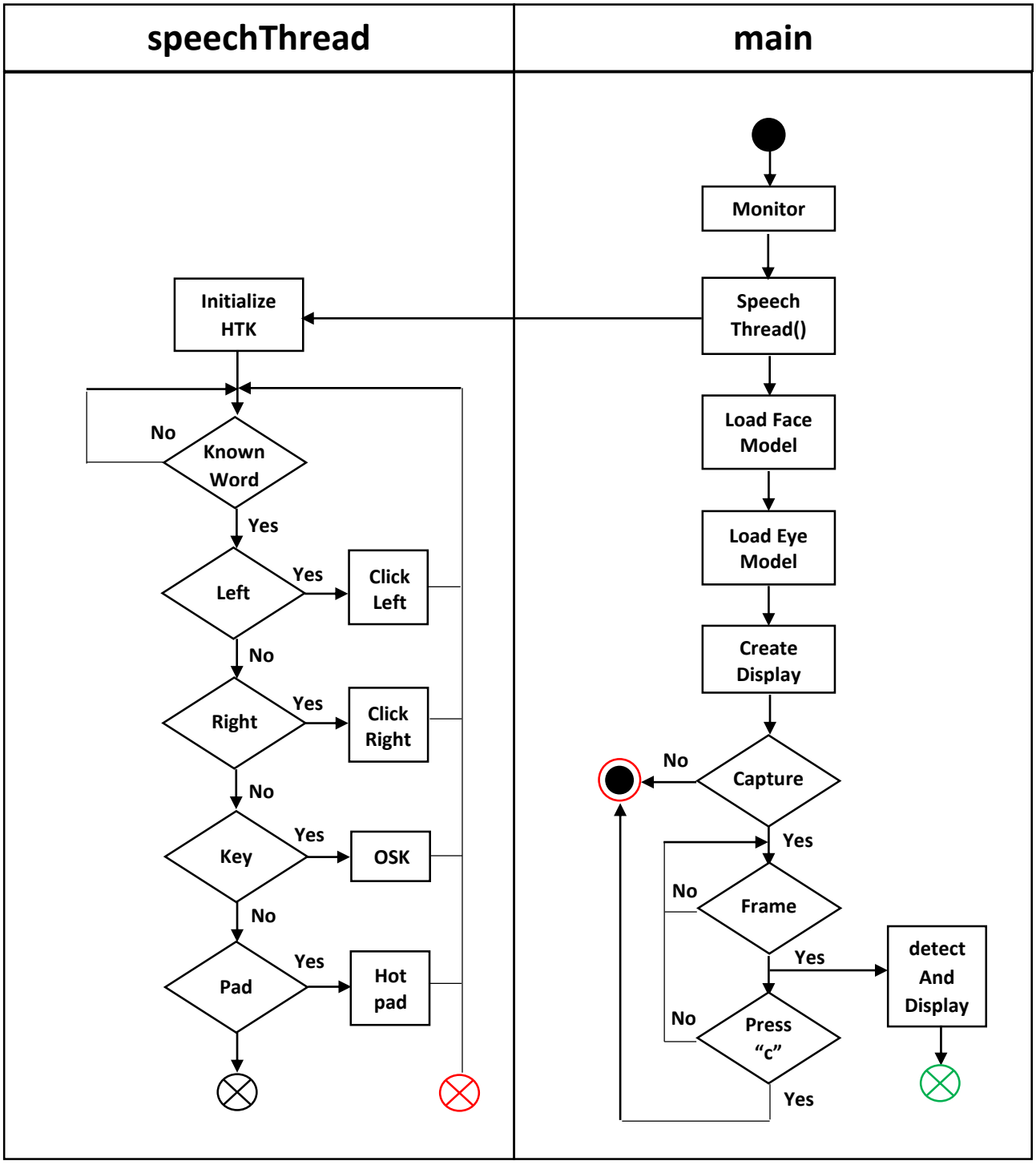
Mouse move direction is calculated by arctan[center(eye) - center(ellipse)]. The moving speed is determined by how far are the eyes from ellipse.

2. **speechThread**: speech command handler

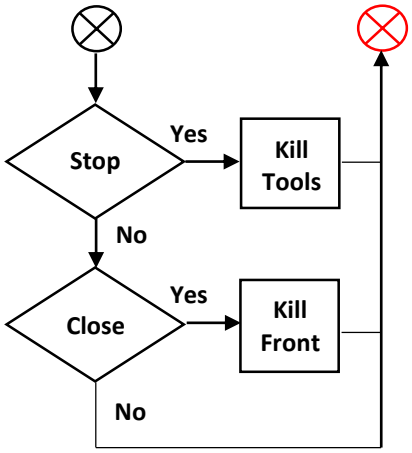
- left: mouse click left
- right: mouse click right
- zoom: call zoom.exe
- pad: call hotpad.exe
- key: call on screen keyboard
- stop: close assistive program (zoom, pad, keyboard)
- close: kill active program (front most running process)

3. **main**: run monitor.exe in background to turn off after inacitivity. Initialize pretrained models, camera capture windows, and called  speechThread, detectAndDisplay.

# Flowchart



## speechThread




## detectAndDisplay