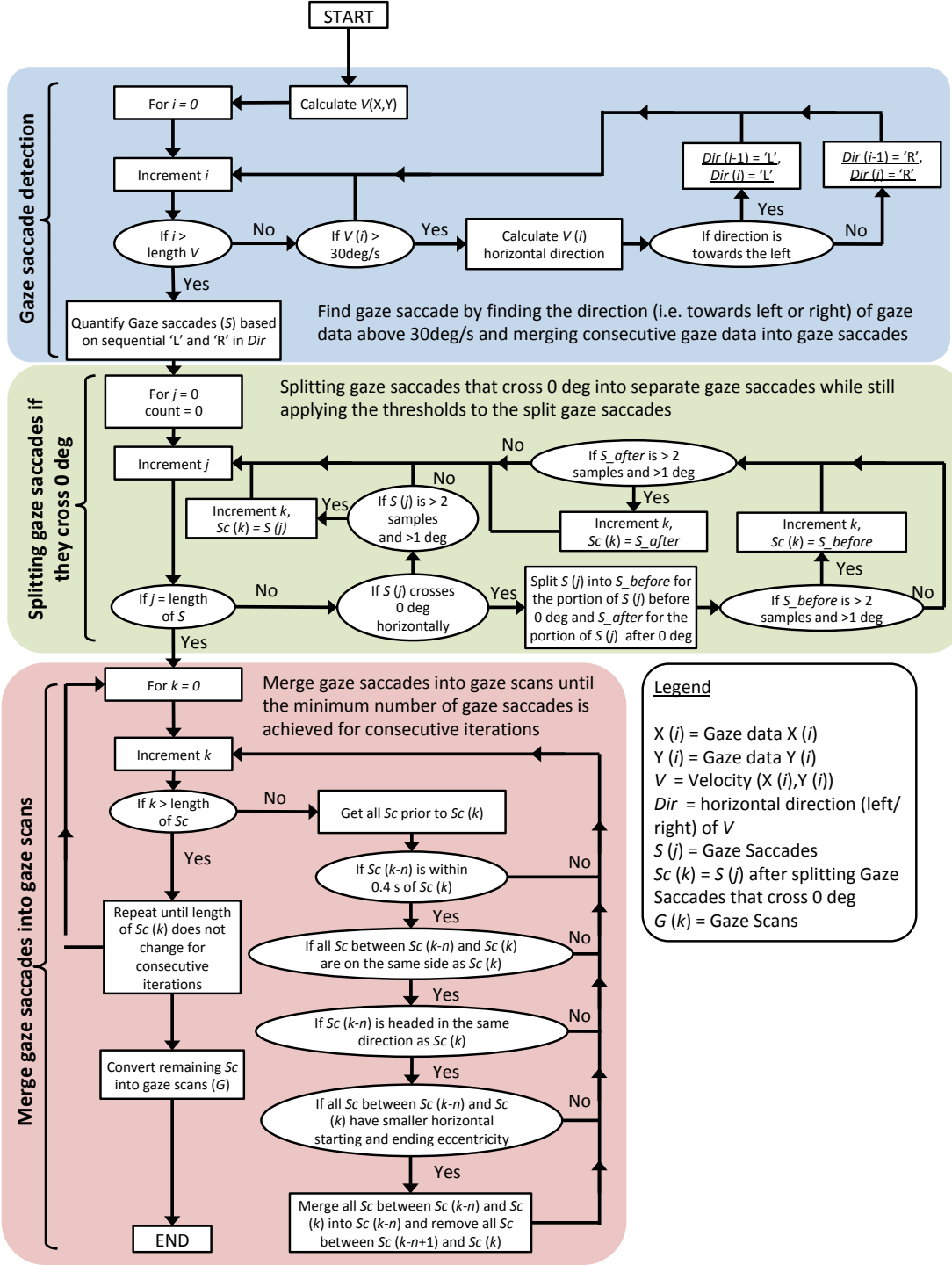
START
Gaze saccade detection
For i = 0
Calculate V(X,Y)
Increment i
If i > length V
No
If V (i) > 30deg/s
Yes
Calculate V (i) horizontal direction
If direction is towards the left
Yes
No
Dir (i-1) = 'L', Dir (i) = 'L'
Dir (i-1) = 'R', Dir (i) = 'R'
Yes
Quantify Gaze saccades (S) based on sequential 'L' and 'R' in Dir
Find gaze saccade by finding the direction (i.e. towards left or right) of gaze data above 30deg/s and merging consecutive gaze data into gaze saccades
Splitting gaze saccades if they cross 0 deg
For j = 0 count = 0
Splitting gaze saccades that cross 0 deg into separate gaze saccades while still applying the thresholds to the split gaze saccades
Increment j
If S_after is > 2 samples and >1 deg
No
Yes
Increment k, Sc (k) = S_after
If S (j) is > 2 samples and >1 deg
No
Yes
Increment k, Sc (k) = S (j)
Increment k, Sc (k) = S_before
Yes
If j = length of S
No
If S (j) crosses 0 deg horizontally
Yes
Split S (j) into S_before for the portion of S (j) before 0 deg and S_after for the portion of S (j) after 0 deg
If S_before is > 2 samples and >1 deg
No
Yes
Merge gaze saccades into gaze scans
For k = 0
Merge gaze saccades into gaze scans until the minimum number of gaze saccades is achieved for consecutive iterations
Increment k
If k > length of Sc
No
Get all Sc prior to Sc (k)
If Sc (k-n) is within 0.4 s of Sc (k)
No
Yes
If all Sc between Sc (k-n) and Sc (k) are on the same side as Sc (k)
No
Yes
If Sc (k-n) is headed in the same direction as Sc (k)
No
Yes
If all Sc between Sc (k-n) and Sc (k) have smaller horizontal starting and ending eccentricity
No
Yes
Merge all Sc between Sc (k-n) and Sc (k) into Sc (k-n) and remove all Sc between Sc (k-n+1) and Sc (k)
Yes
Repeat until length of Sc (k) does not change for consecutive iterations
Convert remaining Sc into gaze scans (G)
END
Legend
X (i) = Gaze data X (i)
Y (i) = Gaze data Y (i)
V = Velocity (X (i),Y (i))
Dir = horizontal direction (left/ right) of V
S (j) = Gaze Saccades
Sc (k) = S (j) after splitting Gaze Saccades that cross 0 deg
G (k) = Gaze Scans