PURSUING SMOOTH PURSUITS

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Automatic Eye Movement Classification

- Faster and less biased than expert annotation
- Work well for fixations (FIX) and saccades (SAC)

Smooth Pursuits (SP)

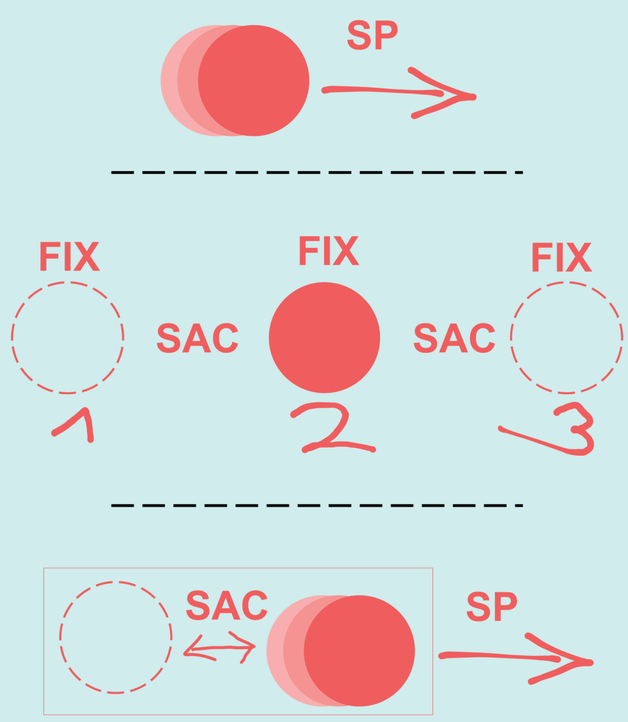
- Difficult for expert annotators and algorithms
- Particularly difficult to distinguish from fixations

Goal: Create benchmark data set without human labels and find better features

2

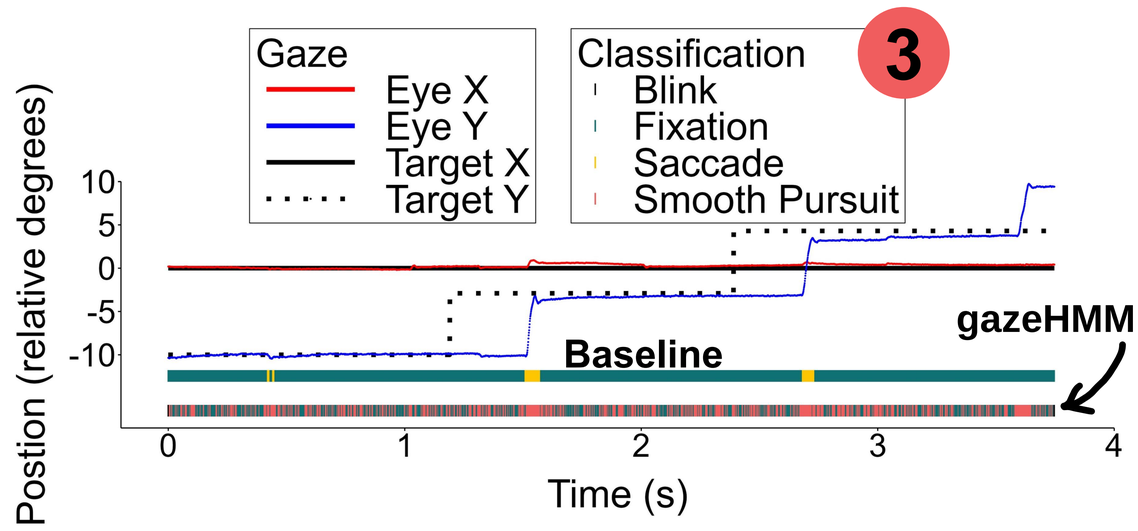
Current Study

- N = 10 (~4 hours of eye movements)
- 3 stimuli to evoke specific eye movements
- 3 speeds (1°/s, 3°/s, 6°/s)
- 8 trajectories (horizontal, vertical, diagonal)

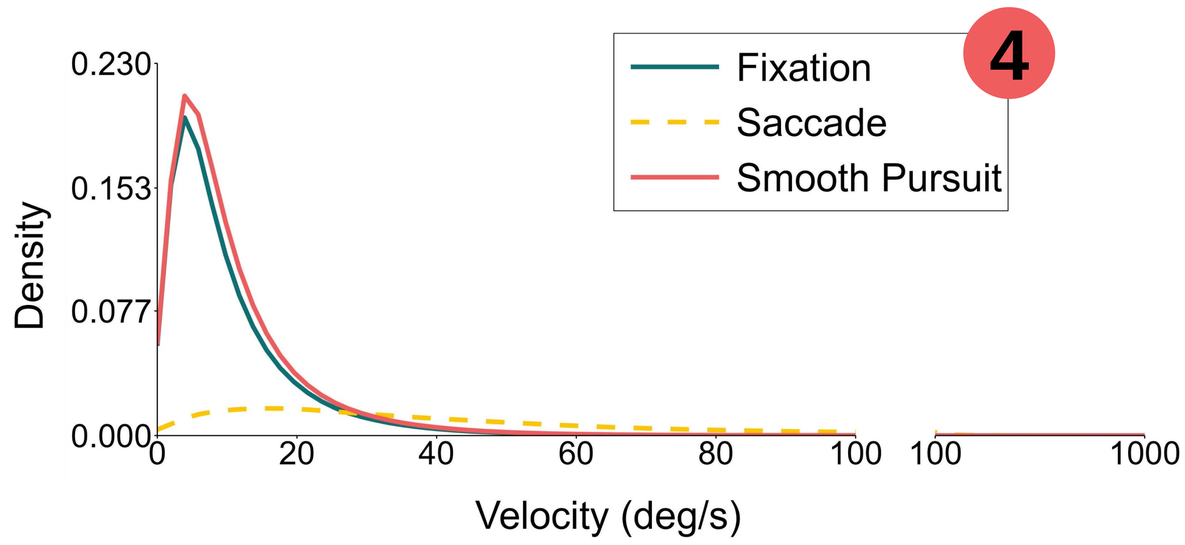


- Dynamic velocity threshold to distinguish SP / FIX from SAC for ground truth
- Investigation of gazeHMM (Lüken et al., 2020)
- New features inspired by Startsev et al. (2019)

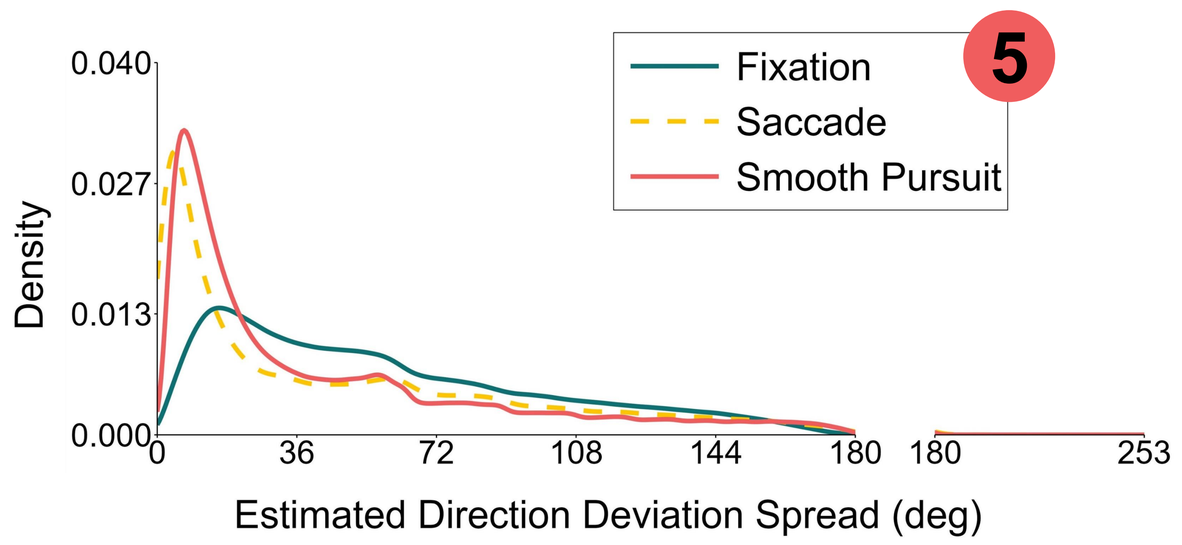
gazeHMM rapidly switches between FIX and SP



gazeHMM features can't distinguish FIX and SP



New features look promising



Full Report and References

- **Existing algorithms fail to distinguish fixations and smooth pursuits**
- **New benchmark dataset without human annotation**
- **Two novel features may distinguish fixations and smooth pursuits**