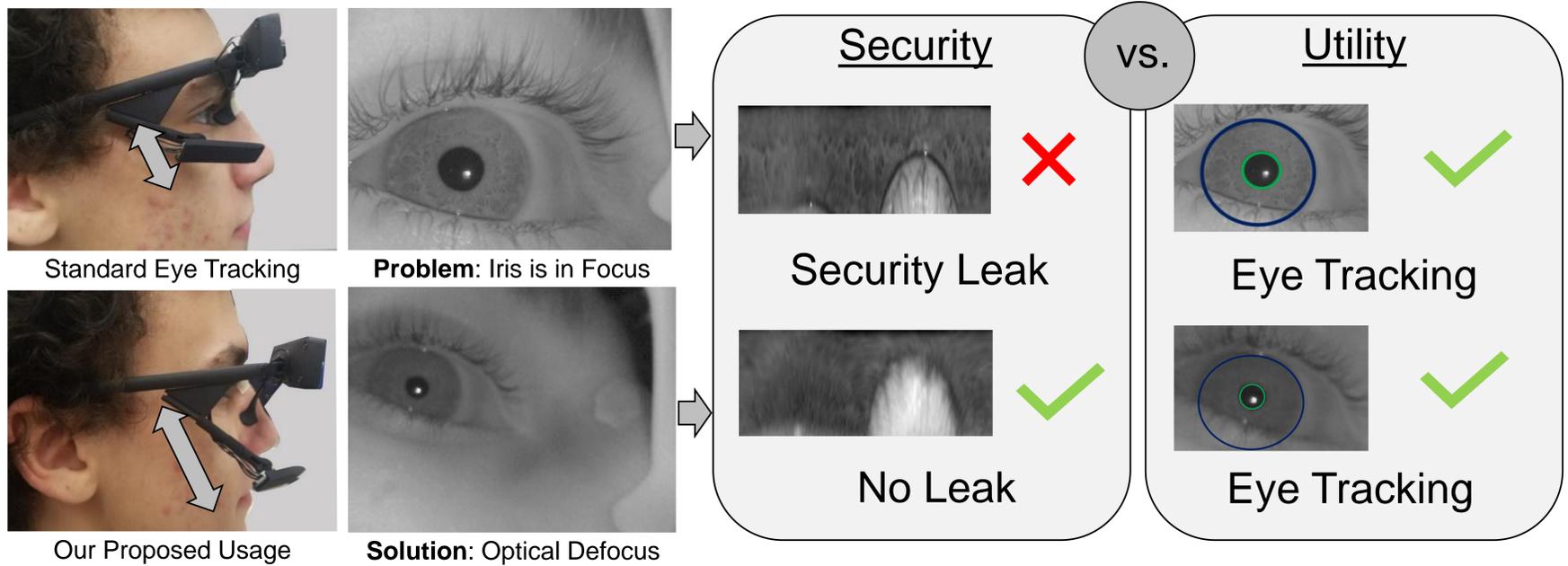


# EyeVEIL: Degrading Iris Authentication in Eye Tracking Headsets

Brendan John, Sanjeev Koppal, Eakta Jain  
University of Florida, USA



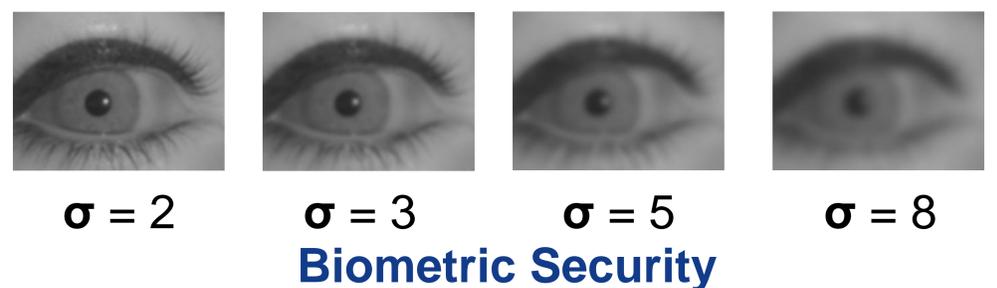
## First contribution

We show that iris based identification is possible with the resolution and quality of images captured by eye trackers in mixed reality headsets (320x240).



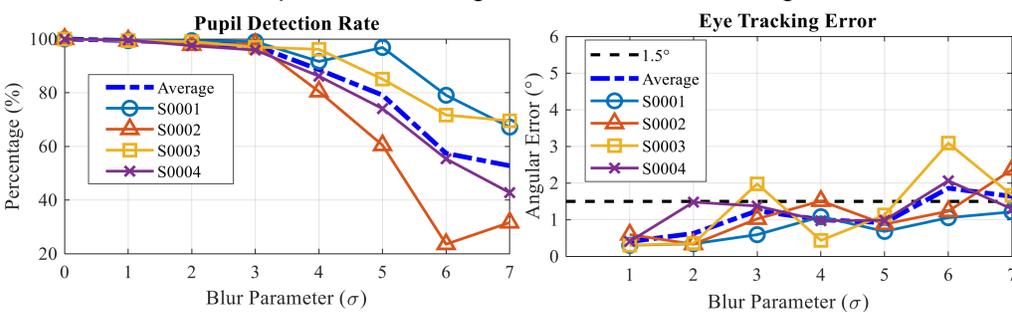
## Second contribution

We demonstrate that a low pass filter can blur the eye image and degrade the accuracy of iris authentication, while still permitting gaze tracking.



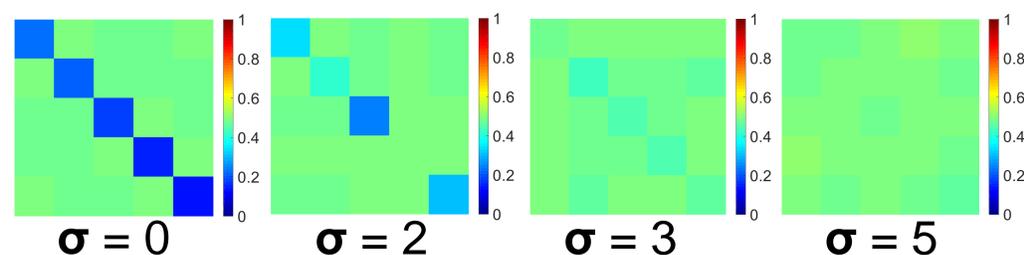
### Eye Tracking Utility

Pupil detection rate and gaze location were computed from the blurred images. Gaze error was computed between ground truth and blurred gaze locations.



### Biometric Security

Iris images from each user were compared and Hamming Distance generated. A distance less than 0.37 indicates a successful match (Blue), and otherwise is considered a failure (Green).  $\sigma = 3$  significantly reduces authentication, and at  $\sigma = 5$  there are no more successful matches.

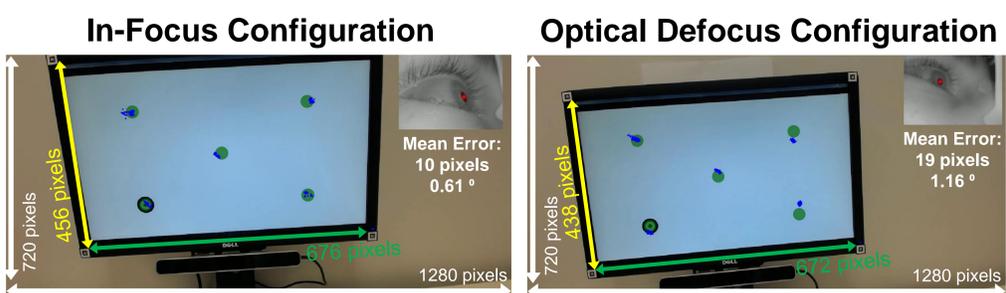


## Third contribution

We show that a user can be empowered to secure their iris biometric by adjusting the focus of the camera.

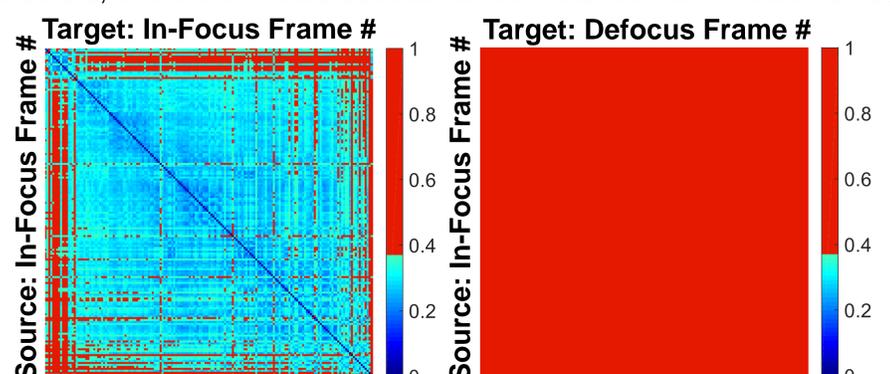
### Eye Tracking Utility

One participant viewed five circular targets on a monitor while wearing a Pupil Labs monocular eye tracker. Error was computed between the gaze position and the target center for both In-Focus and Defocused configurations (see proposed usage). Gaze data (Blue) from all targets (Green) is shown below.



### Biometric Security

We compared each frame from a series of eye images from the user in both configurations. The below matrices contain Hamming Distances between Source (row) and Target (column) images. Red indicates a failed match, and blue a success. We found 91% of the In-Focus frames successfully matched the others, and 0% of the Defocused frames matched the In-Focus frames.



## Acknowledgments

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