

## **DeepMReye calibration protocol (DeepMReyeCalib)**

The experiment will be run first in a 3T scanner, with combined backward video-projection (ProPixx HD resolution at 120Hz, max field of view of 20 dva) and eye-tracking (EyeLink monocular tracking at 1kHz, 13 points calibration before the scanner starts).

We will test 10 subjects an experiment composed of 3 distinct part played in fixed order and repeated 2 times (3 runs, ~3 min). Participants will be trained outside the scanner first.

Scanning sequence: MB4, 2mm isotropic, 1.2 sec TR, whole head 60 slices

Anatomical T1w, 4:05 min (ABCD\_T1w\_MPR\_vNav\_setter3; T1w\_MPRAGE\_vNav\_0p8m),

Anatomical T2w, 2:35min (ABDC\_T2w\_vNav\_setter2, T2w\_vNav\_08mm

Fieldmap\_topup\_AP, 0:35 min

Fieldmap\_topup\_PA, 0:35 min

DeepMReyeCalib bold (run 01,02,03), 3 x 3:13 min

DeepMReyeClosed bold (run 01,02,03) 3 x 6:26 min

### **Part 1: Fixation Task**

- A 0.25 dva radius white bull's eye is displayed on a gray background at pseudo-random locations picked on a 5 by 5 square grid of 18 dva side, repeated twice (random selection but avoiding two times the same position).
- 54 trials per run
- Trial duration: 1.2 seconds (1 TR)
- This task starts and ends with inter-trial interval (ITI) 6.0 seconds (5 TRs)
- Duration of about ~1 min (including ITI)

### **Part 2: Smooth Pursuit**

- The white bull's eye moves on the gray background with pseudo-random amplitudes of 3 dva, 5 dva, or 7 dva, repeated 54 times, at random angles selected randomly between 0-340 degrees in steps of 20°. The movement angle is selected randomly to keep the bull's eye in an imaginary centered square of 18 dva side.
- Duration of 1 trial: 1.2 seconds (1 TR)
- 54 trials per run
- End with inter-trial interval (ITI) of 6.0 seconds (5 TRs).
- Duration of about ~1 min (including ITI)

### **Part 3: Free Viewing**

- Participants freely view 10 centered pictures of 18 dva size
- Duration of 1 trial: 3.6 seconds (3 TRs)
- 10 trials per run
- End with inter-trial interval (ITI) of 6.0 seconds (5 TRs).
- Duration of about ~1 min (including ITI)

