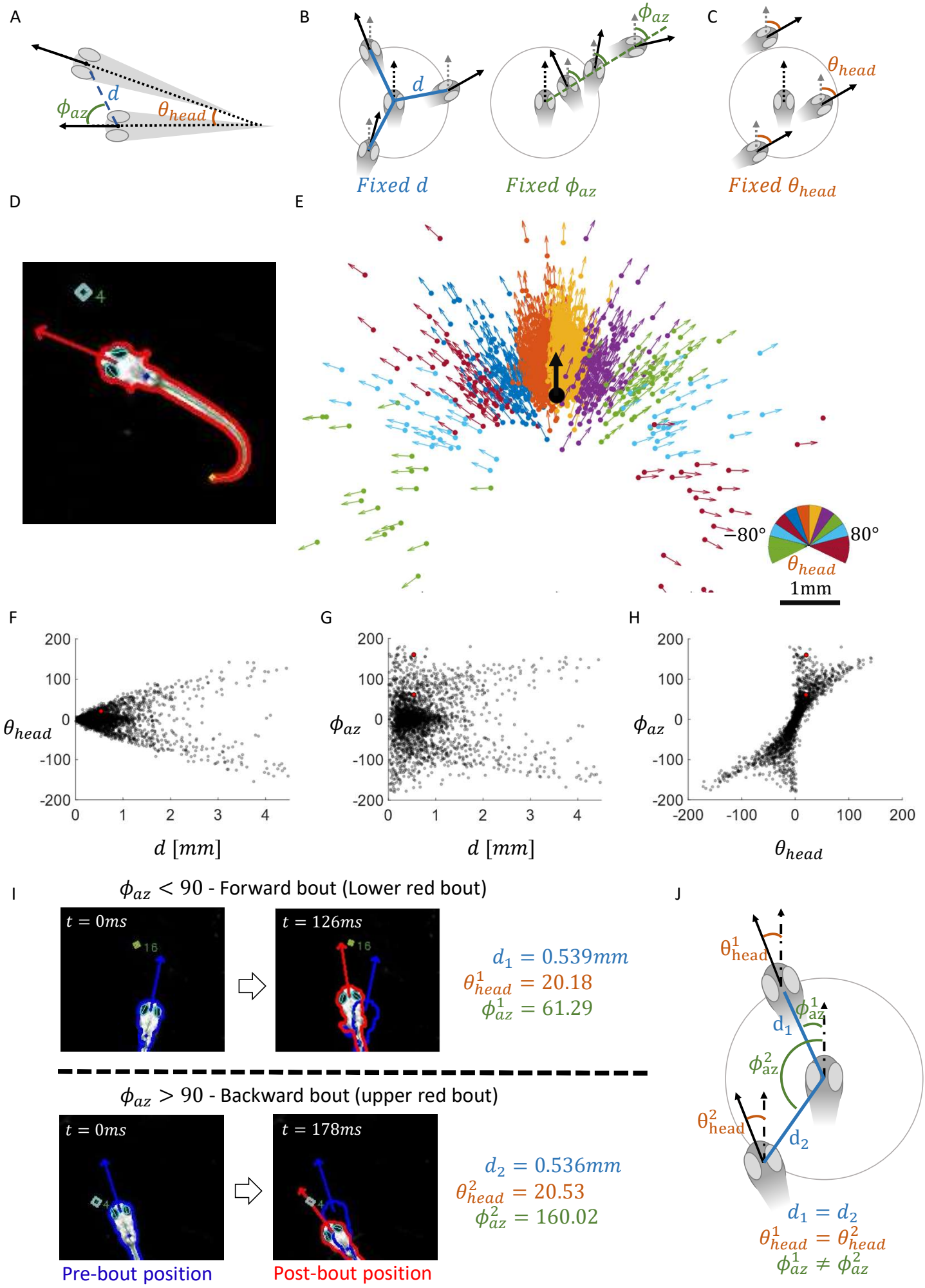
A
$d$
$\phi_{az}$
$\theta_{head}$
B
$d$
$\phi_{az}$
Fixed $d$
Fixed $\phi_{az}$
C
$\theta_{head}$
Fixed $\theta_{head}$
D
E
−80°
80°
$\theta_{head}$
1mm
F
$\theta_{head}$
$d$ [mm]
G
$\phi_{az}$
$d$ [mm]
H
$\phi_{az}$
$\theta_{head}$
I
$\phi_{az} < 90$ - Forward bout (Lower red bout)
$t = 0ms$
$t = 126ms$
$d_1 = 0.539mm$
$\theta^1_{head} = 20.18$
$\phi^1_{az} = 61.29$
$\phi_{az} > 90$ - Backward bout (upper red bout)
$t = 0ms$
$t = 178ms$
$d_2 = 0.536mm$
$\theta^2_{head} = 20.53$
$\phi^2_{az} = 160.02$
Pre-bout position
Post-bout position
J
$\theta^1_{head}$
$\phi^1_{az}$
$d_1$
$\phi^2_{az}$
$\theta^2_{head}$
$d_2$
$d_1 = d_2$
$\theta^1_{head} = \theta^2_{head}$
$\phi^1_{az} \neq \phi^2_{az}$