

Supplementary Materials for “ScaFi: Length-Scalable, Compliant, Parametric Robotic Fish Design for Operation in Multiple Environmental Niches”

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Supplementary Figures

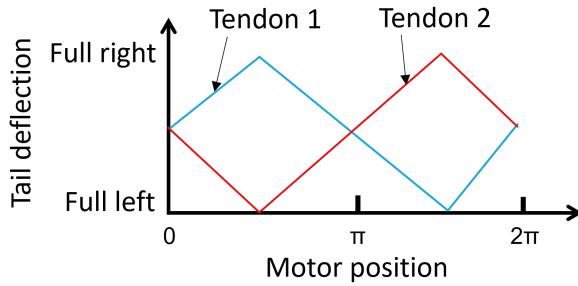


Figure S1. Relationship between the two tendons of the robot and the tail effects. Tendon colors and motor position correspond to those in Fig. 2A,C.

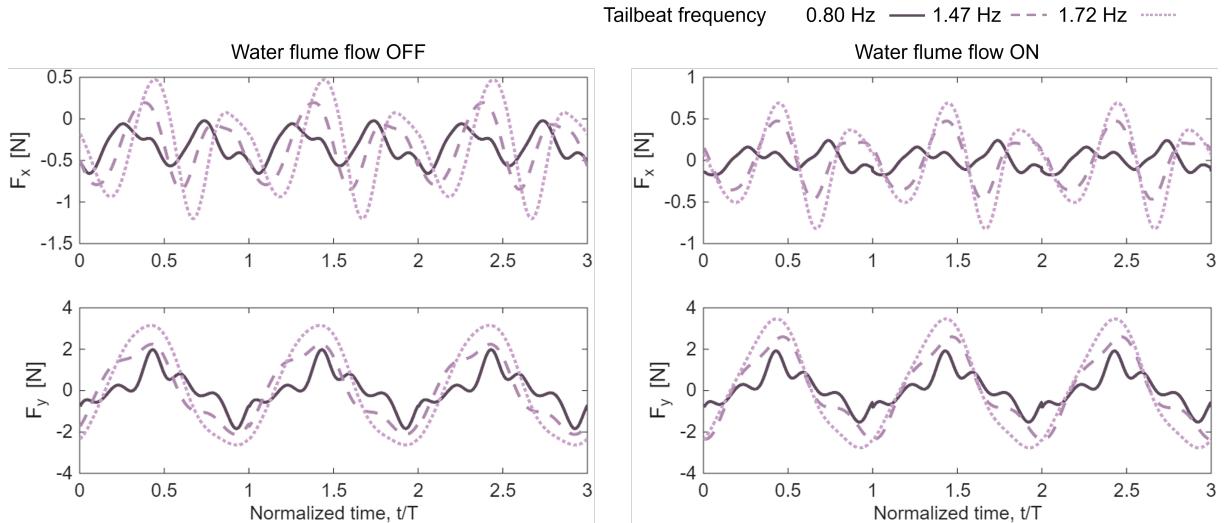


Figure S2. In the PIV experiments where results are shown in Fig. 3, this supplementary figure shows the forces obtained during the experiment where the water flume flow is OFF and ON for three different tailbeat frequencies. Direction X corresponds to the flow direction which is opposite to the direction of forward robot movement if the robot were not statically attached to the rig.

Supplementary Videos

Supplementary Videos 1 and 2 show the robot swimming experiments performed in the paddling pool for gathering velocity and efficiency data for the robot sizes $L = 0.6$ m and $L = 1.1$ m,

respectively.

Supplementary Video 3 shows the robot swimming experiments performed in the EPFL Laboratoire de Machines hydrauliques which accommodated the size and depth required to test the robot of the largest length scale at $L = 2.9\text{ m}$.

Supplementary Videos 4 and 5 show the real-world deployment experiments for multiple scales of the robot.