Electronic Supplementary Material (ESI) for Lab on a Chip.

Supplementary Information

Dynamically Reversible Cooperation and Interaction of Multiple Rotating Micromotors

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Supplementary videos

Video S1: State change from cooperation to interaction of two micromotors (7 Hz to 8 Hz).

Video S2: Temporal separation when the frequency was changed below the state-change frequency range.

Video S3: Different combinations of two micromotors interacting at 12 Hz.

Video S4: Reversible transformation between interactive and cooperative behaviors.

Video S5: Interactive mode of different combinations of three micromotors under different frequencies.

Video S6: Reversible switching between different patterns of three micromotors indicated in **Fig. 5**.

Video S7: Diverse stable patterns of interactive behavior of different number and size of micromotors.

Video S8: Dynamic switching between interactive and cooperative behaviors of one 450 μm and four 300 μm micromotors.

Video S9： Dynamic self-organization of micromotors into hexagons and triangles.

Supplementary Figures

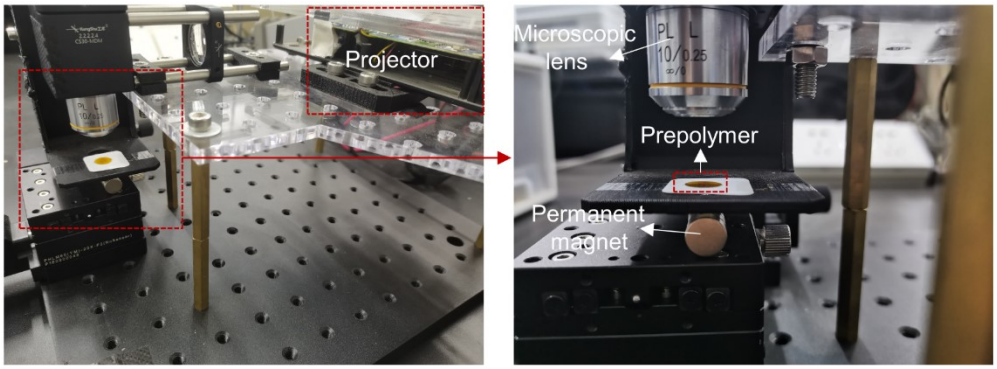

Fig. S1 The self-built digital light printing platform for micromotor fabrication in this work.

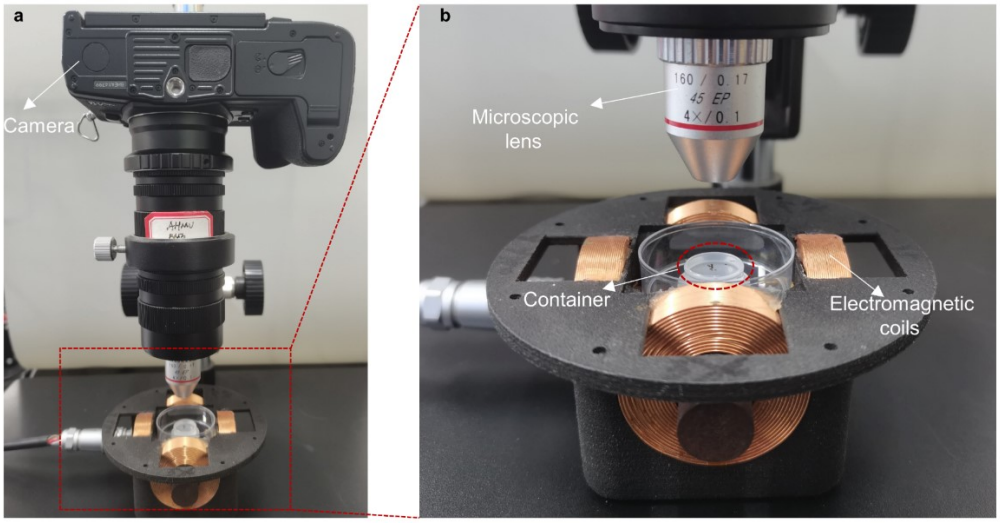

Fig. S2 Electromagnetic coil system for magnetic actuation and video recording.

Fig. S3 The concave air-water interface of the container (diameter: 12.5 mm) in our experiments.

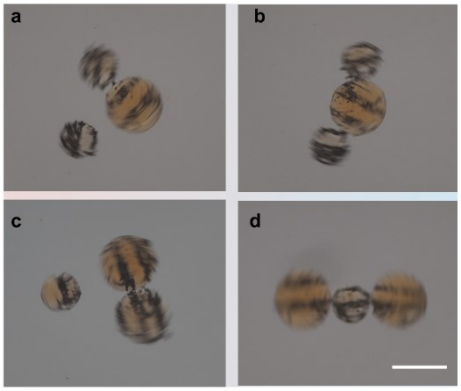

Fig. S4 a, b Another possible assembly of pattern III and IV in Fig. 4a, respectively. **c, d** Another possible assembly of pattern III and IV in **Fig. 4**b. Scale bar: 450 μm.

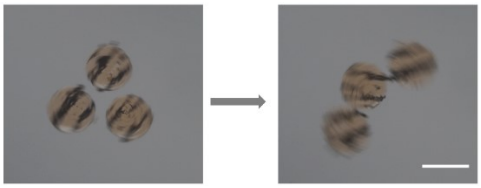

Fig. S5 The three micromotors form a nonlinear structure with certain bending angle when the frequency is directly reduced from a higher value to a lower value. Scale bar: 450 μm.