

**Description:**

Supplementary materials for our manuscript, including 6 simulation animations and 39 excel files.

**Size:**

The total size of all objects is 9.95Mb.

**Player information:**

The simulation animations can be played via a regular player, and the excel files can be opened via a Microsoft excel application.

**Packing list:**

## Animations

- 1) fig10\_ani.mp4 (Animation for Fig. 10 in our manuscript)
- 2) fig11\_ani.mp4 (Animation for Fig. 11 in our manuscript)
- 3) fig12\_ani.mp4 (Animation for Fig. 12 in our manuscript)
- 4) fig13\_ani.mp4 (Animation for Fig. 13 in our manuscript)
- 5) shape\_contorl\_ssc\_curve.mp4 (Animation for shape control method with a static shape control curve in our manuscript)
- 6) shape\_control\_dscb\_curve.mp4 (Animation for shape control method with a dynamic shape control backbone curve in our manuscript)

## Excel files

- 1) fig10\_cls\_path.xlsx ( $CLS\_path$  data for Fig. 10 in our manuscript)
- 2) fig10\_cp.xlsx ( $Con\_p$  data for Fig. 10 in our manuscript)
- 3) fig10\_csi\_path.xlsx ( $CSI\_path$  data for Fig. 10 in our manuscript)
- 4) fig10\_n.xlsx ( $n_{link\_ssc}$  and  $n_{link\_dscb}$  data for Fig. 10 in our manuscript)
- 5) fig10\_ob.xlsx ( $OB_i$  data for Fig. 10 in our manuscript)
- 6) fig10\_p.xlsx ( $P_{hrm(m)}^j$  data for Fig. 10 in our manuscript)
- 7) fig10\_p\_dscb.xlsx ( $P_{hrm\_dscb(k)}^j$  data for Fig. 10 in our manuscript)
- 8) fig10\_p\_ssc.xlsx ( $P_{hrm\_ssc(i)}^j$  data for Fig. 10 in our manuscript)
- 9) fig10\_rrt\_path.xlsx ( $RRT\_path$  data for Fig. 10 in our manuscript)
- 10) fig11\_a.xlsx ( $a_1(t)$ ,  $a_2(t)$ , and  $a_3(t)$  data for Fig. 11 in our manuscript)
- 11) fig11\_cls\_path.xlsx ( $CLS\_path$  data for Fig. 11 in our manuscript)
- 12) fig11\_cp.xlsx ( $Con\_p$  data for Fig. 11 in our manuscript)
- 13) fig11\_csi\_path.xlsx ( $CSI\_path$  data for Fig. 11 in our manuscript)
- 14) fig11\_n.xlsx ( $n_{link\_ssc}$  and  $n_{link\_dscb}$  data for Fig. 11 in our manuscript)
- 15) fig11\_ob.xlsx ( $OB_i$  data for Fig. 11 in our manuscript)
- 16) fig11\_p.xlsx ( $P_{hrm(m)}^j$  data for Fig. 11 in our manuscript)
- 17) fig11\_p\_dscb.xlsx ( $P_{hrm\_dscb(k)}^j$  data for Fig. 11 in our manuscript)
- 18) fig11\_p\_ssc.xlsx ( $P_{hrm\_ssc(i)}^j$  data for Fig. 11 in our manuscript)
- 19) fig11\_rrt\_path.xlsx ( $RRT\_path$  data for Fig. 11 in our manuscript)
- 20) fig12\_a.xlsx ( $a_1(t)$ ,  $a_2(t)$ , and  $a_3(t)$  data for Fig. 12 in our manuscript)
- 21) fig12\_cls\_path.xlsx ( $CLS\_path$  data for Fig. 12 in our manuscript)

- 22) fig12\_cp.xlsx ( $Con\_p$  data for Fig. 12 in our manuscript)
- 23) fig12\_csi\_path.xlsx ( $CSI\_path$  data for Fig. 12 in our manuscript)
- 24) fig12\_n.xlsx ( $n_{link\_ssc}$  and  $n_{link\_dscb}$  data for Fig. 12 in our manuscript)
- 25) fig12\_ob.xlsx ( $OB_i$  data for Fig. 12 in our manuscript)
- 26) fig12\_p.xlsx ( $P_{hrm(m)}^j$  data for Fig. 12 in our manuscript)
- 27) fig12\_p\_dscb.xlsx ( $P_{hrm\_dscb(k)}^j$  data for Fig. 12 in our manuscript)
- 28) fig12\_p\_ssc.xlsx ( $P_{hrm\_ssc(i)}^j$  data for Fig. 12 in our manuscript)
- 29) fig12\_rrt\_path.xlsx ( $RRT\_path$  data for Fig. 12 in our manuscript)
- 30) fig13\_a.xlsx ( $a_1(t)$ ,  $a_2(t)$ , and  $a_3(t)$  data for Fig. 13 in our manuscript)
- 31) fig13\_cls\_path.xlsx ( $CLS\_path$  data for Fig. 13 in our manuscript)
- 32) fig13\_cp.xlsx ( $Con\_p$  data for Fig. 13 in our manuscript)
- 33) fig13\_csi\_path.xlsx ( $CSI\_path$  data for Fig. 13 in our manuscript)
- 34) fig13\_n.xlsx ( $n_{link\_ssc}$  and  $n_{link\_dscb}$  data for Fig. 13 in our manuscript)
- 35) fig13\_ob.xlsx ( $OB_i$  data for Fig. 13 in our manuscript)
- 36) fig13\_p.xlsx ( $P_{hrm(m)}^j$  data for Fig. 13 in our manuscript)
- 37) fig13\_p\_dscb.xlsx ( $P_{hrm\_dscb(k)}^j$  data for Fig. 13 in our manuscript)
- 38) fig13\_p\_ssc.xlsx ( $P_{hrm\_ssc(i)}^j$  data for Fig. 13 in our manuscript)
- 39) fig13\_rrt\_path.xlsx ( $RRT\_path$  data for Fig. 13 in our manuscript)

#### **Contact information:**

If you have questions regarding the materials, please feel free to contact us via following E-mails:

zhangxiaobo@sia.cn

liujinguo@sia.cn

yangmin.li@polyu.edu.hk