LIPM 步态规划汇报

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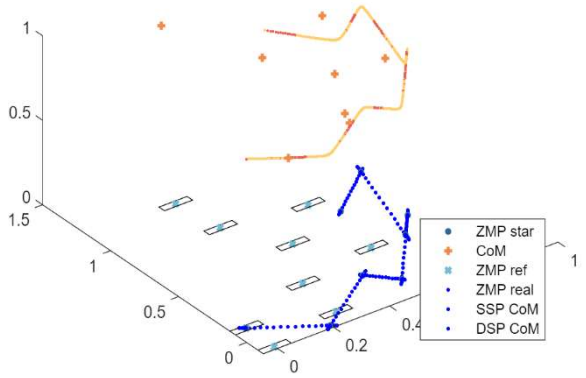
1. 阅读了 Kajita, S., Hirukawa, H., Harada, K. & Yokoi, K. Introduction to Humanoid Robotics. Springer Tracts Adv. Robot. 1–17 (2014) doi:10.1007/978-3-642-54536-8_1.
2. 调整了代码，根据

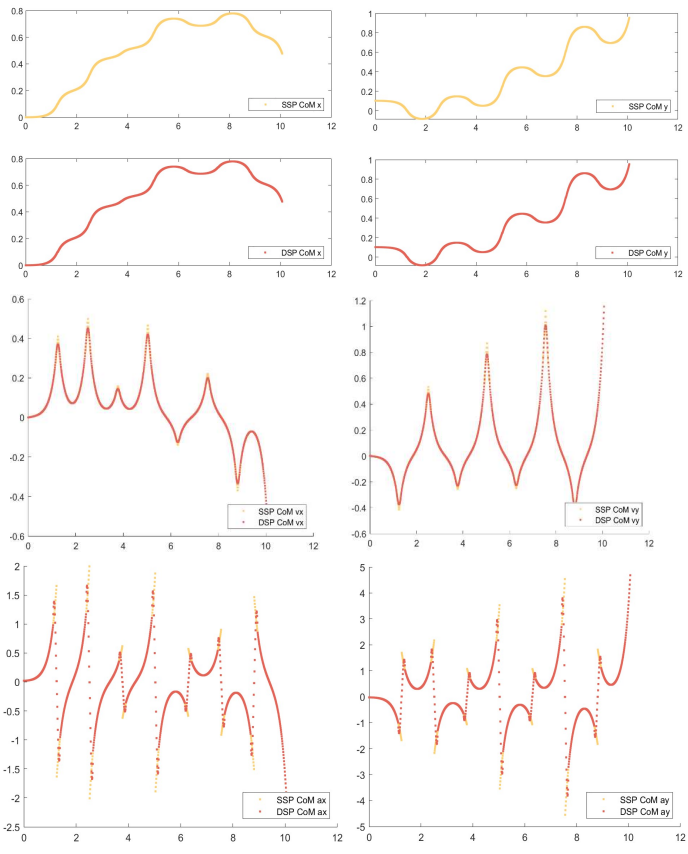
$$\begin{bmatrix} \bar{x}^{(n)} \\ \bar{y}^{(n)} \end{bmatrix} = \begin{bmatrix} \cos s_\theta^{(n+1)} & -\sin s_\theta^{(n+1)} \\ \sin s_\theta^{(n+1)} & \cos s_\theta^{(n+1)} \end{bmatrix} \begin{bmatrix} s_x^{(n+1)}/2 \\ (-1)^n s_y^{(n+1)}/2 \end{bmatrix}$$

重新编写代码，获得了一系列机器人转弯的步态规划图如下

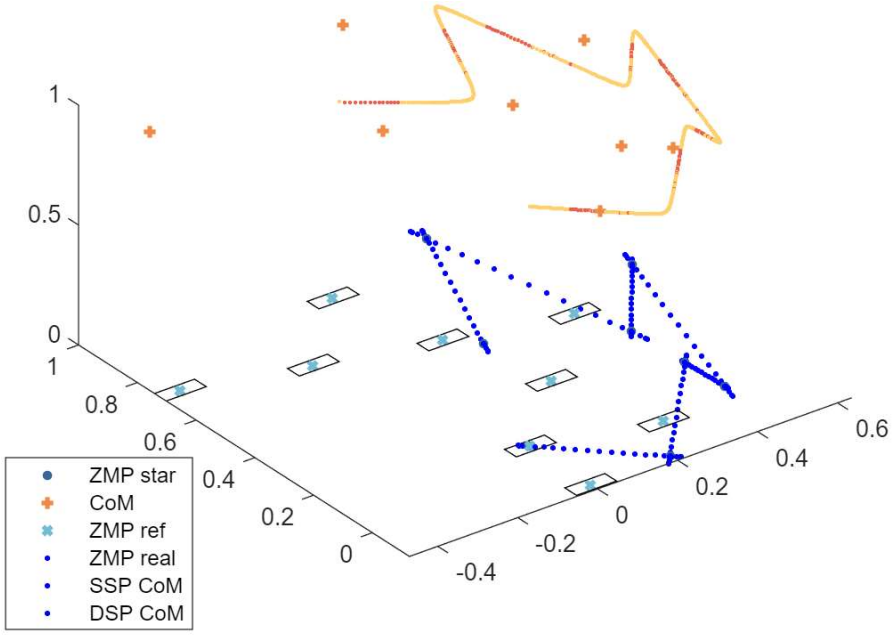
3.

```
% 设定步行单元
% 脚印位置
s_x = [0.0,         step_length,    step_length,    step_length,    step_length, step_length, step_length, step_length, 0.0];
s_y = [body_width,  body_width,     body_width,     body_width,     body_width,  body_width,  body_width,  body_width,  body_width];
s_theta = [0, 20, 40, 60, 80, 100, 120, 140, 160] / 360 * (2 * pi);
```

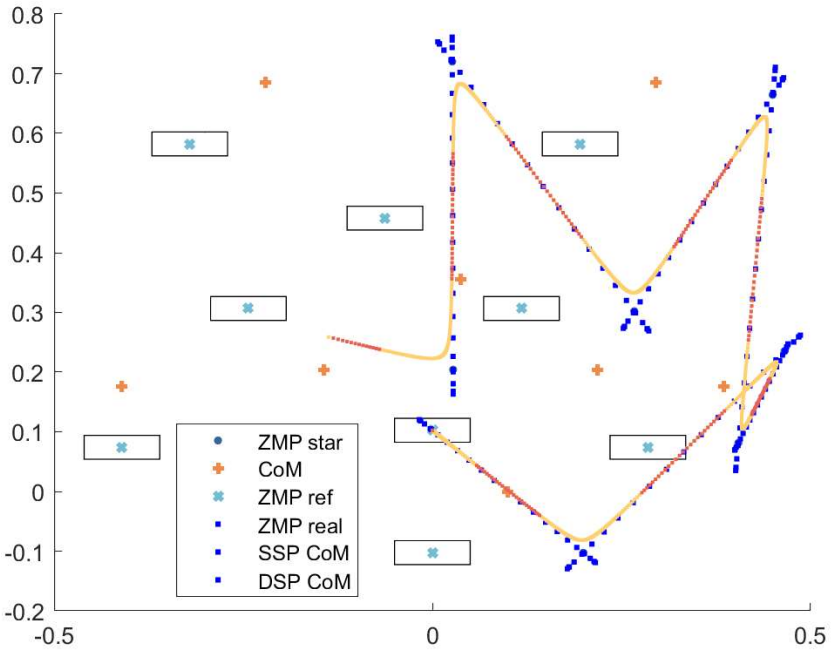




```
% 设定步行单元
% 脚印位置
s_x = [0.0,         step_length,    step_length,    step_length,    step_length, step_length, step_length, step_length, 0.0];
s_y = [body_width,  body_width,     body_width,     body_width,     body_width,  body_width,  body_width,  body_width,  body_width];
s_theta = [0, 30, 60, 90, 120, 150, 180, 210, 240] / 360 * (2 * pi);
```




```
% 设定步行单元
% 脚印位置
s_x = [0.0,         step_length,    step_length,    step_length,    step_length, step_length, step_length, step_length, 0.0];
s_y = [body_width,  body_width,     body_width,     body_width,     body_width,  body_width,  body_width,  body_width,  body_width];
s_theta = [0, 40, 80, 120, 160, 200, 240, 280, 320] / 360 * (2 * pi);
```



最后一张图实现了一个掉头的步态规划