a) Traditional Serial Plannin
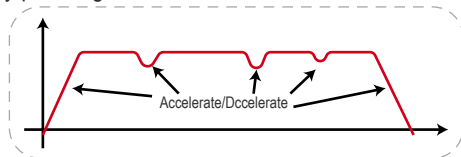
a.1 G-Code Input
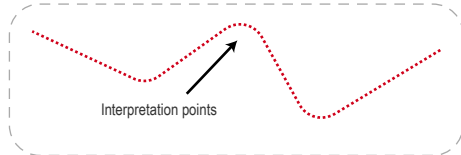
start point

N1 N2 N3 N4

a.2 Path smoothing

G-Code path

Smoothed path

a.3 Velocity planning

Accelerate/Dccelerate
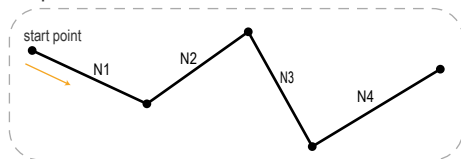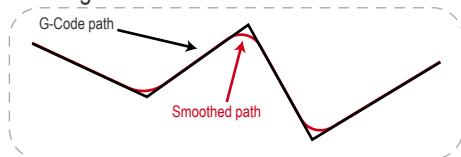
a.4 Interpretation

Interpretation points

a.5 Servo command

b) J-NNC end-to-end Planning

b.1 G-Code Input

start point

N1 N2 N3 N4

b.2 PPO Agent

Layer 0
Input Layer

X_1 X_2 X_3 $\cdots$ X_n

Layer 1
Hidden Layer1

S_{1-1} S_{1-2} S_{1-3} $\cdots$ S_{1-i}

Layer 3
Hidden Layer2

S_{2-1} S_{2-2} S_{2-3} $\cdots$ S_{2-j}

Layer 4
Output Layer

Y_1 Y_2
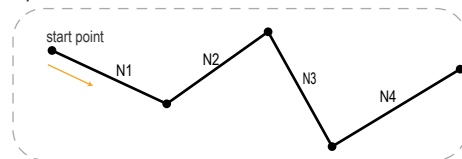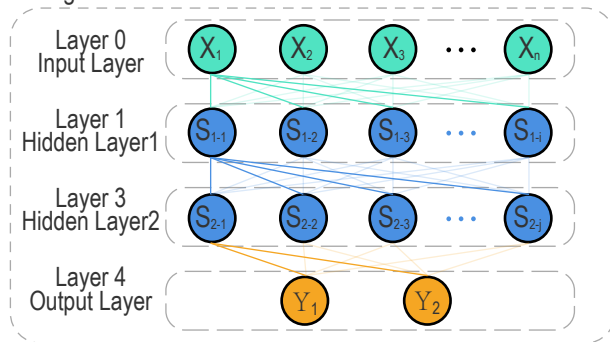
b.3 Kinematic Constraint Module

1. Jerk Constraint

2. Back-calculate Safe Accel & Vel

b.4 Safe Servo Command