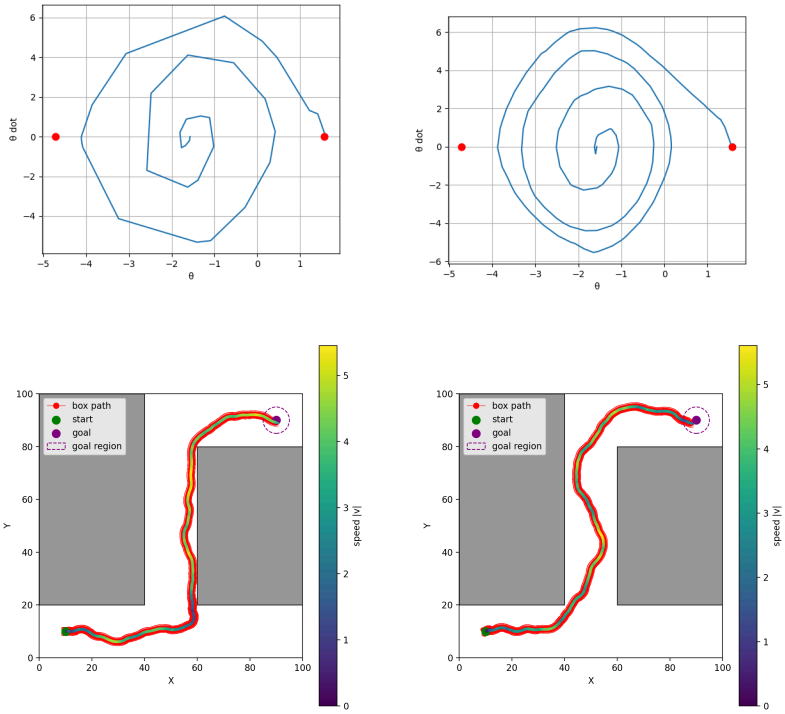
vc68 cl307 project 4 report

1. Pendulum (RRT vs KPIECE)

    - The start is (−π/2, 0) (hanging down) and the goal is (π/2, 0) (upright)
      Control Space limitation: torque [-3,3]
      Configuration Space limitation: angular velocity [-10,10]



    - The left image (RRT) explores 5,239 states in total and quickly finds a solution in 0.0317 s, though the resulting trajectory is relatively sparse. The right image (KPIECE1) explores more thoroughly with 81,288 states in a longer 0.0747 s, leading to a denser and smoother state path.Car (RRT vs KPIECE)

- The start and goal of the first environments is (10, 10), (90, 90).
  Control space Limitation: Angular velocity: [-1, 1], Acceleration: [-2, 2]
  Configuration space Limitation: x,y: [0, 100], velocity: [-10, 10]
  KPIECE projection dimension: 2 (x, y)

- The left graph is route planned by RRT with 2333 states and 0.211 sec, the color map indicates the velocity, while the right is the route planned by KPIECE with 2302 states and 1.71 sec