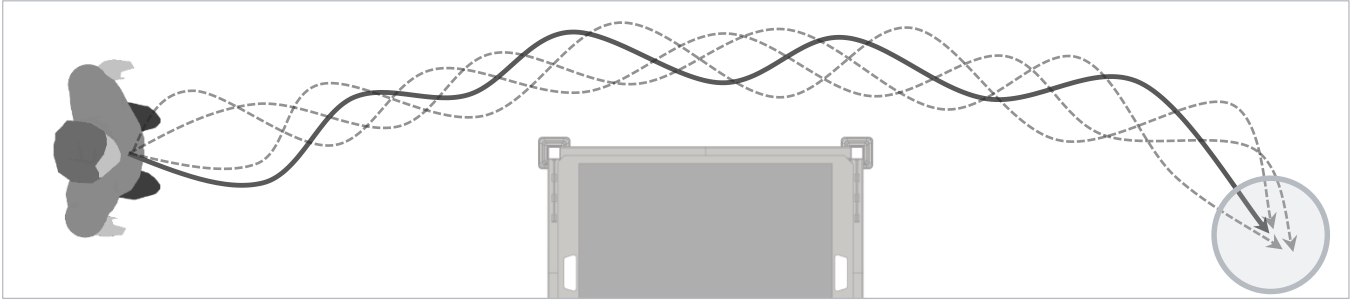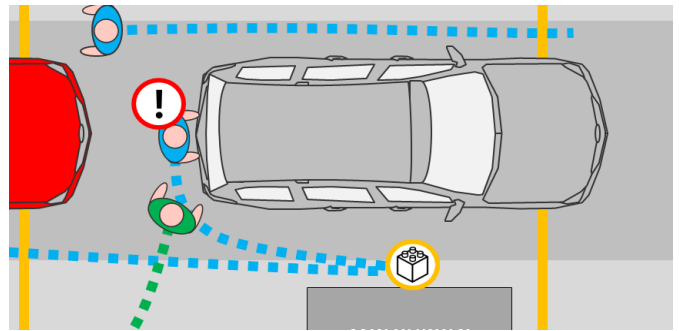# A Probabilistic Motion Planning Algorithm for Realistic Walk Path Simulation


Motivation

- The **prediction** of **human motions** is a **key-technology** for various domains to cope with future challenges

- For **automotive industry**, amongst others, the **simulation** of **walk paths** occurring in final assembly lines is becoming increasingly important

- Literature presents a broad spectrum of **motion planning approaches**, which either **neglect** the **statistical nature** of human motion or are **partly applicable** to this use-case

Concept

- The proposed algorithm combines a **hybrid A*** path planner with a **probabilistic motion graph**

- Each **trajectory** is generated by means of **combining** multiple **motion primitives**, which are drawn from a **statistical motion model**

- The **motion model** is set-up using **5 hours** of **MoCap** data containing approx. 20 000 succeeding steps

- The **sampled primitives** define the **possible actions** within each **expand step** of the hybrid A* algorithm
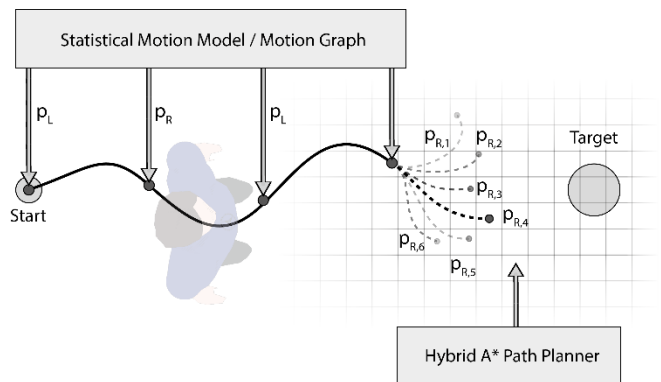
Results

- An **infinite variety** of **realistic walking trajectories** can be obtained using the novel statistical motion planning algorithm

- The **mean computation** time for a trajectory of 6 meter is **.5 seconds**

- The proposed algorithm **predicts** the **statistical nature** of **human locomotion**