Thanks Flavie, to make the transition to the article.

... So, the article "Humanoid Path Planning for Rough Terrain Navigation" presents a trajectory planning approach for humanoid robots to navigate in [redacted] risky environments. This approach merge [redacted] a path planner [redacted], a balance controller and a step planner to allow a robot like Atlas to move through challenging terrain in a fluid and natural way.

... The path planner uses the A* algorithm (based on Dijkstra algorithm) to find an optimal trajectory through difficult [redacted] areas while minimizing effort costs and maximizing stability. To do this, the planner uses a height map [redacted] and calculates [redacted] costs to avoid hard-to-cross areas, The goal [redacted] minimize the amount of energy required for movement. ~~These costs~~ [redacted]. Of course, the

... The IHMC balance controller and step planner are then used to track the path calculated by the path planner. The step planner uses a map of flat regions to determine the best fulcrum points for each step of the robot. This map is generated from a high-resolution LIDAR point cloud [redacted] and [redacted]. The step planner [redacted] uses the A* algorithm to find the best step sequence to follow the path planner path [redacted]

and on the right, the generated algorithm trajectories in specific cases.

... As you can see on the board, we have different article pictures. On the left, [redacted] we have [redacted] volumes and the ground generated by the LIDAR sensor [redacted]

So, we can note that the robot will not try to jump over the stairs ([redacted] in example A and C) or to step over an obstacle ([redacted] in example B), because it would be too expensive in energy. Instead, he uses the environment has its advantage, as shown in example D.

Of course, the algorithm [redacted] was tested on the Atlas robot [redacted] in challenging terrains. The results show [redacted] the [redacted] path planning allows the robot to move through [redacted] risky terrain in a fluid and natural way. However, it should be noted that the A* algorithm can sometimes encounter "dead end" problems, [redacted] The planner spends a lot of time looking for a possible trajectory [redacted]. The authors suggest using a series of simplified metrics to improve [redacted] the A* algorithm and speed up trajectory planning.

... To conclude, the article trajectory planning approach ~~represents a significant advance~~ was a major step in the field of challenging terrain robotic navigation. ~~The results obtained on the Atlas robot demonstrate the~~ Atlas's Results demonstrate ~~approach~~ feasibility and suggest research avenues to improve trajectory planning in risky terrain ~~on the Atlas robot~~

... To [redacted] finish this presentation and show [redacted] results, I will let you watch [redacted] this short 2min video, which quickly presents the Altas features pushed by this navigation algorithm.

(Video)

Thank you for listening. Do you have any questions?