User Control Δv_i , Steering **Approach Planning Running Controller** Activated if d < 3Impulse-Planning Control **Obstacle Detection** with Speed Regulation MPC QP Δv_i 2D LiDAR Sensor 1D Kinematic CoM Model Desired Speed $\Delta v_i \longrightarrow \Delta v_{i+1} \longrightarrow$ Changes d, h Measured d_{i+1} d_{i} Distance and N*(Optimal Number of Steps) Height of the Obstacles. **Jumping Optimization Jumping Controller** Ξ Activated if $N^* \le 2$ Nonlinear Open-loop Execution of Obstacle **Programming Centroidal** Force Trajectories $\alpha_{x,z}^{f,b}$ Lidar Momentum Model 2D LiDAR Sensor Force d, h Parameters Lidar X (m) $F(\alpha_{x,z}^b)$