Algorithm *Extend(x_{near}, x_{rand}, S)*

(∗ Finds a point close to x_{rand} that is in $\epsilon-$neighbourhood of x_{near} ∗)respecting the kinodynamic constraints

1. $x_{new} \leftarrow arg\max\limits_{a \in A} \|x - x_{rand}\|_J \underline{\quad\quad} x_{new} - x_{near}\|$ is within kinematic bounds and action a_{max} which generated x_{new} is within the acceleration bounds

2. $(r, x_{new}) \leftarrow \text{MDP}(x_{near},a)$

3. return (x_new, a, r)

4. End of Algorithm