1: **Input**: observed state $P_i = \{p_i, \dot{p}_i, \ddot{p}_i\}$, demonstration $P_d = \{P_{d,0}, \dots, P_{d,M}\}$, and time step Δt 2: Output $P_G = \{p_G, \dot{p}_G, \ddot{p}_G\}$ Generated trajectory

Algorithm 1 Trajectory Generation from DMP Sequences

3:
$$P_G^{t=0} \leftarrow P_i$$

4: $m = \operatorname{argmin}_m \|p_{d,m} - p_i\|_2$

5:
$$j \leftarrow j(m), G \leftarrow G_j, \Theta \leftarrow \Theta_j$$

6: $t_{ref,0} \leftarrow t_m \in [0, T_S)$ \triangleright Time of reference at m

7: **for**
$$t_i = 0, \ldots, T_G$$
 do
8: Calculate $\dot{P}_{G}^{t_i}(G, \Theta, z_i)$ at $z_i = z(t_{ref,0} + t_i)$ using

8: Calculate
$$P_G^{t_i}(G, \Theta, z_i)$$
 at $z_i = z(t_{ref,0} + t_i)$ using DMP equations (i.e. Eqs. 1, 4, or 5)

9: Integrate trajectory
$$P_G^{t_{i+1}} = P_G^{t_i} + \dot{P}_G^{t_i} \Delta t$$

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0: **if** $t_i + t_m \ge T_G$ **then** \triangleright Start next segment

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$$t_i + t_m \ge T_G$$
 then \Rightarrow Start next segments

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$$G \leftarrow G_{j(m)+1}$$
 \Rightarrow Start next segme

$$G \leftarrow G_{j(m)+1}$$

11:
$$G \leftarrow G_{j(m)+1}$$

12: $\Theta \leftarrow \Theta_{j[i]+1}$

$$G \leftarrow G_{j(m)+1}$$

11:
$$G \leftarrow G_{j(m)+1}$$

 $t_{ref,0} \leftarrow 0$

end if

13:

14.

15: **end for**