Algorithm 1 Driving cycle construction

Input: Ω ▷ Real Driving Cycle Data

Output: B ▷ Constructed Driving Cycle

Load Real driving cycle data $\Omega = \{\omega_i\}$

for each driving cycle ω_i **do** ▷ Dynamic segmentation and Segment grouping

  Partition into K segments and represent it as $\omega_i = s_{i,1}, s_{i,2}, ..., s_{i,K}$

  Define segment group G_j as the set of j^{th} segments from all driving cycles, $G_j = s_{1,j}, s_{2,j}, ..., s_{N,j}$

end for

for each segment group G_j **do**

  Form a distance matrix using (4), (5), and (6)

  Find the index of the reference segment using (7) and (8)

  To create state space X_j, build S-A grid map and assign states

  procedure Markov chain(G_j,X_j) ▷ Markov chain modeling

    Compute transition probabilities for G_j

    Set-up Markov chain transition probability matrix $\mathbf{P}$ using (3)

    for $m \leftarrow 1, M$ **do** ▷ Monte Carlo simulation

      $C \leftarrow \{c_m\}$ ▷ Generate M new segments according to $\mathbf{P}$

    end for

  end procedure

  Compute the DTW distance between c_m and R_j using (9)

  Select the best driving segment b_j using (10)

end for

Construct best representative driving cycle by $B = concat\,(b_1, b_2, \ldots, b_K)$