Algorithm 1 Calculating expected average activity

function CALCULATE_EXPECTED_AVERAGE($A, B, u(t)$)
    $t \leftarrow 0$
    repeat
        $t \leftarrow t + t_{step}$
        $X(t) \leftarrow A * X + B * u(t)$
    until $\sum_j X_j(t) = 0$ or $t = t_{max}$
end function

Algorithm 2 Calculating empirical average activity

function CALCULATE_EMPIRICAL_AVERAGE($A, B, u(t)$)
    for trials $k \leftarrow 1, k_{max}$ **do**
        $s_{avg}(k) \leftarrow trigger\_avalanche(A, B, u(t))$
    end for
    return $\frac{1}{k} \sum_k s_{avg}(k)$
end function

Algorithm 3 Generating spikes

function TRIGGER_AVALANCHE($A, B, u(t)$)
    $t \leftarrow 0$
    repeat
        $t \leftarrow t + t_{step}$
        for all neurons j **do**
            $s_j(t) \leftarrow \sum_{u_j(t-1)} R(B_j) + \sum_{i \to j} \sum_{s_i(t-1)} R(A_{ij})$
        end for
    until $\sum_j s_j(t) = 0$ or $t = t_{max}$
    return s
end function
▷ $R(p)$ is a random, Bernoulli process with probability p
▷ $i \to j$ indicates neurons i that synapse to j