



## OPEN Correction: Multi-texture synthesis through signal responsive neural cellular automata

Mirela-Magdalena Catrina, Ioana Cristina Plajer & Alexandra Băicoianu

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Correction to: *Scientific Reports* <https://doi.org/10.1038/s41598-025-23997-7>, published online 17 November 2025.

The original version of this Article contained an error in Algorithm 3 where a line was omitted from the published version of the Article. Specifically, in the *Methodology* section under the subsection *multi-texture generation* in Algorithm 3 line 10: “ $i_g \leftarrow$  index of element with highest loss(batch)” was omitted.

The original Algorithm and accompanying legend appear below.

**Require:** The *pool\_size* of *nca* states, the *number\_of\_epochs* and *batch\_size*, the size of the texture  $h, w, n_h$  - the number of cells' state hidden channels, and  $n_g$  - the number of genome channels.

**Ensure:** The trained *nca*, the final pool.

```

1: pool  $\leftarrow$  init_pool(pool_size)
2: nca  $\leftarrow$  init_nca_params()
3: for iteration  $\in$  range(0, number_of_epochs) do
4:   batch  $\leftarrow$  random pick batch_size elements from pool
5:    $i_g \leftarrow$  iteration % n_genomes
6:   if exists  $i_g$  genome in batch then
7:      $worst_{i_g} \leftarrow$  genome_highest_loss_state(batch,  $i_g$ )
8:   else
9:      $worst_{i_g} \leftarrow$  highest_loss_state(batch)
10:  end if
11:  batch[worstig].x  $\leftarrow$  seed_of_genome( $h, w, n_h, h_g, i_g$ )
12:  num_steps  $\leftarrow$  random(64, 90)
13:  for  $i \in$  range(0, num_steps) do
14:    batch.x  $\leftarrow$  nca(batch.x)
15:  end for
16:  loss  $\leftarrow$  compute_loss(batch.x, target_images(batch.y))
17:  apply nca weights backpropagation
18:  pool  $\leftarrow$  put updated individuals of batch back in the pool
19: end for
20: return nca

```

▷ States and corresponding genome indices  
▷ Computes index of current genome

The original Article has been corrected.

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