## Supplementary file for – A Distributed Epigenetic Shape Formation and Regeneration Algorithm for a Swarm of Robots

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This file contains information on the various techniques which have been proposed and implemented as a part of this work.

### **1 SKEW COORDINATE SYSTEM**

The step by step graphical visualization to understand the generation of skewed bitmap is shown in Fig. 1. The associated pseudocode for the same is illustrated in Algorithm 1.

**Algorithm 1** Algorithm for the generation of skew bitmap

- R = Total number of rows;
   i = 1, j = 0;
   R\_List = [R<sub>i</sub>];
- 4: while j < R do
- 5: **for** each r in R\_List **do**
- 6:  $r \ll 0.5^*$  pixel distance; // Shift rows in *R\_List* by half of the distance between a pair of pixel coordinate
- 7: end for
- 8: j = j + 1;
- 9: append(R\_List, R<sub>i+j</sub>); // Append next row in R\_List
  10: end while

#### 2 GENERATION OF SCALED BITMAP

The steps to generate a scaled bitmap are shown in Fig. 2.

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Figure 1: Steps to generate a skewed bitmap from an input bitmap in square Cartesian system

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Figure 2: Generation of a scaled bitmap