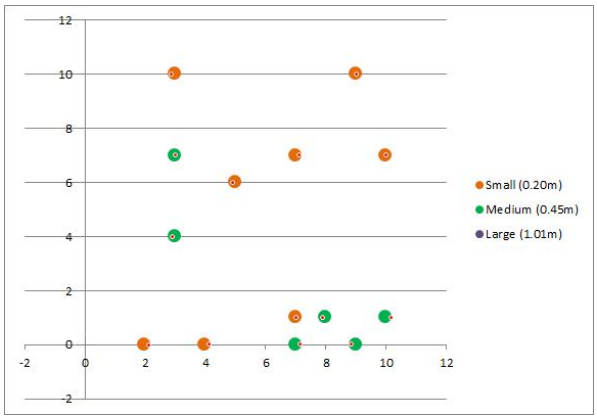
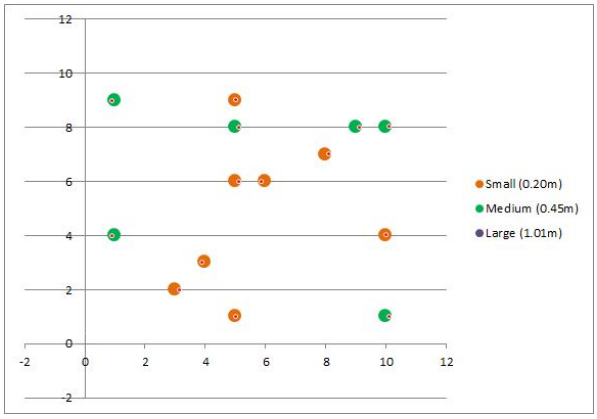
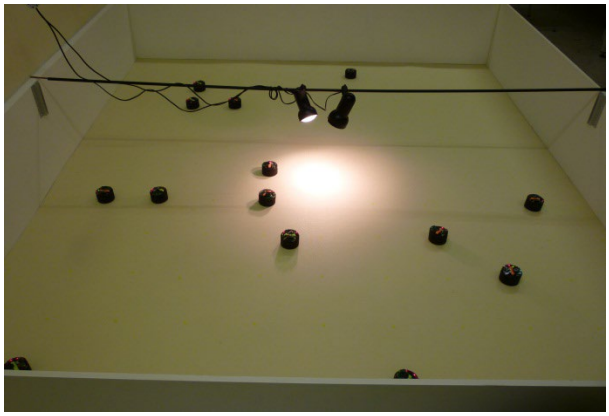
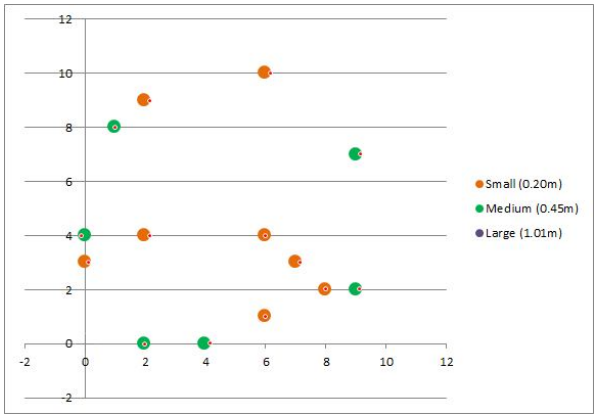
## 1.1 EXPERIMENT STARTING POSITIONS

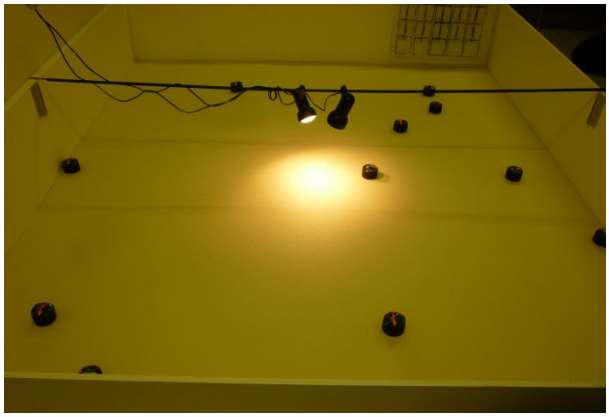
The pre-defined starting positions for the first ten experiments are shown below:

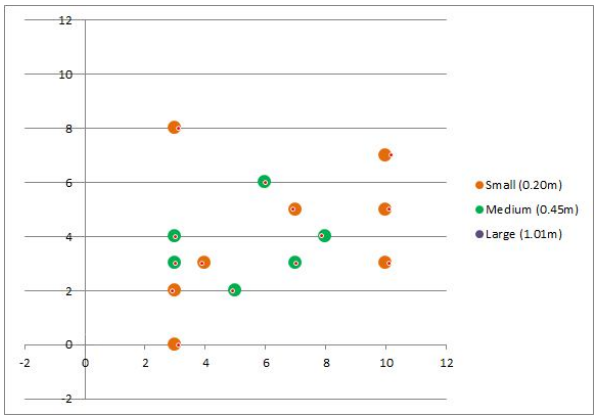


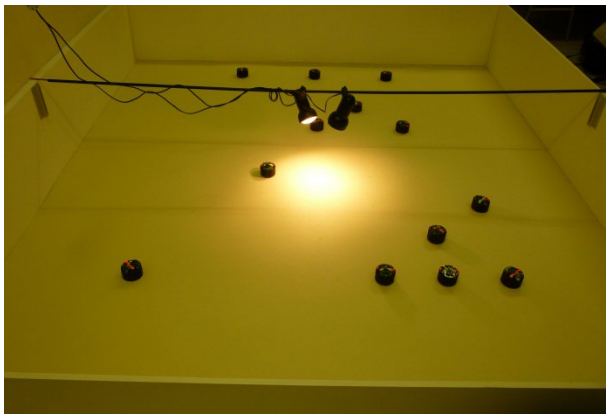


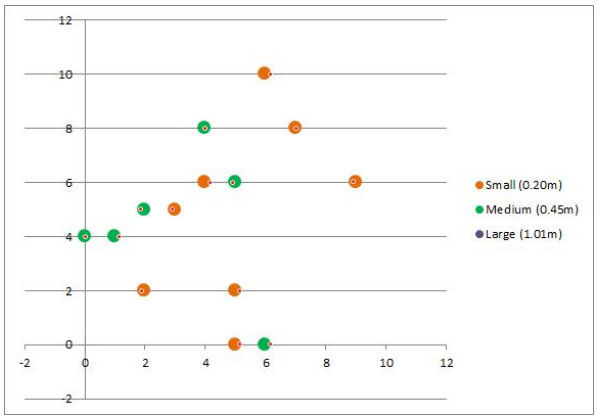










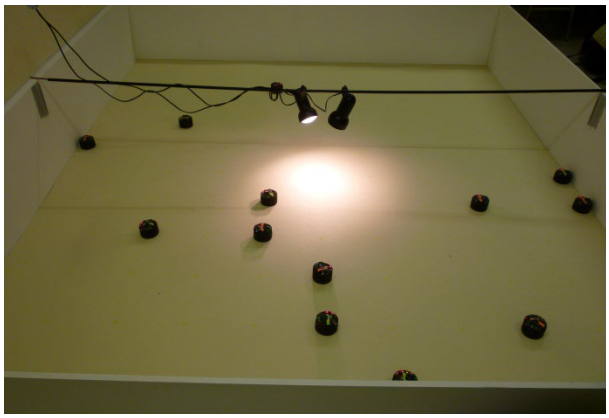
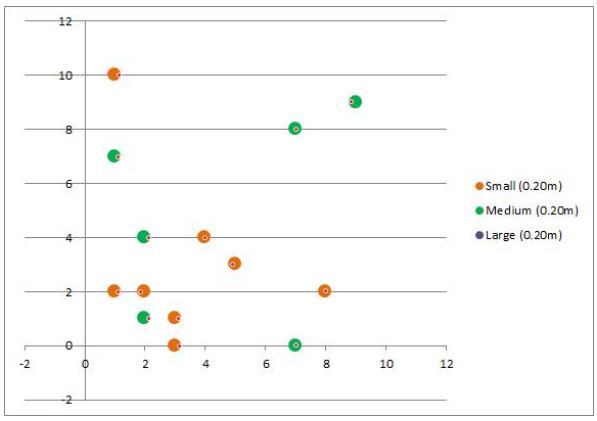
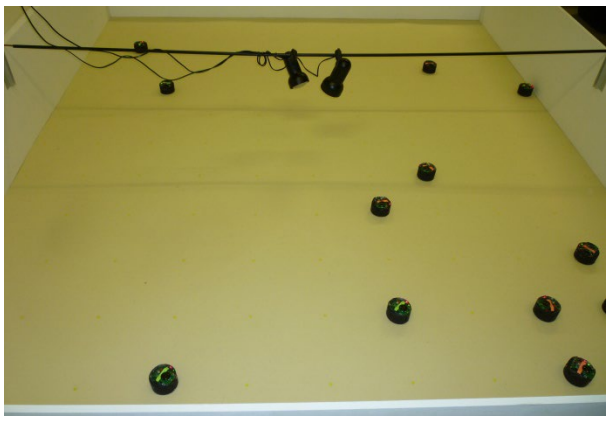
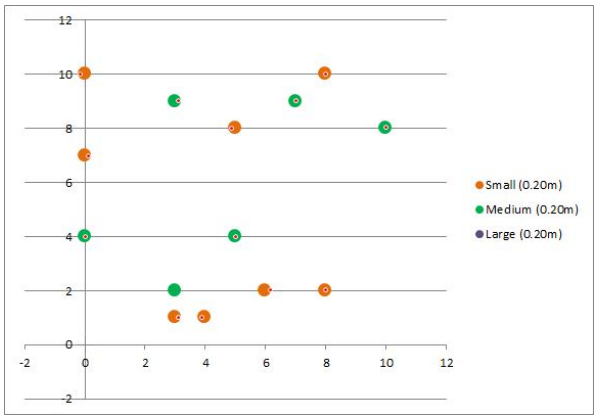



**Figure 0.I: Experiment 1 Starting Positions (A-E)**

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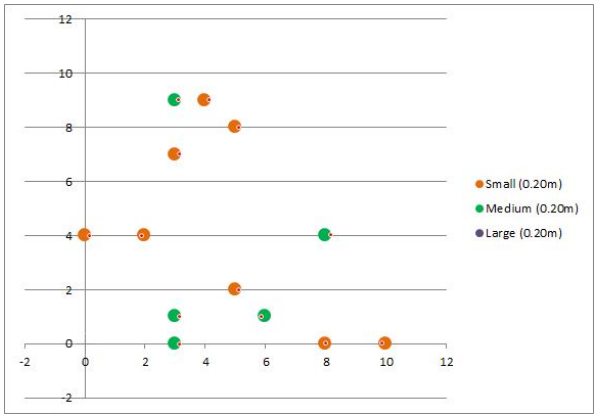
Medium (0.20m)
Large (0.20m)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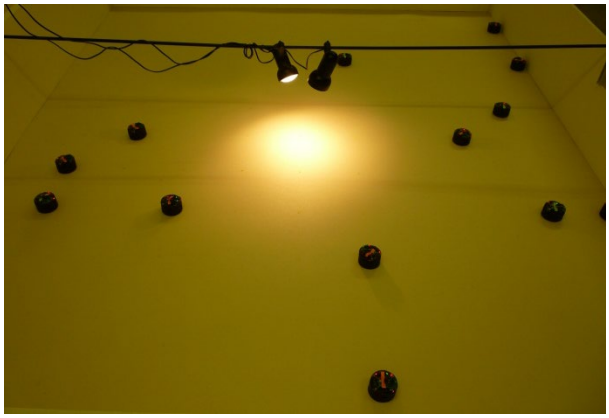
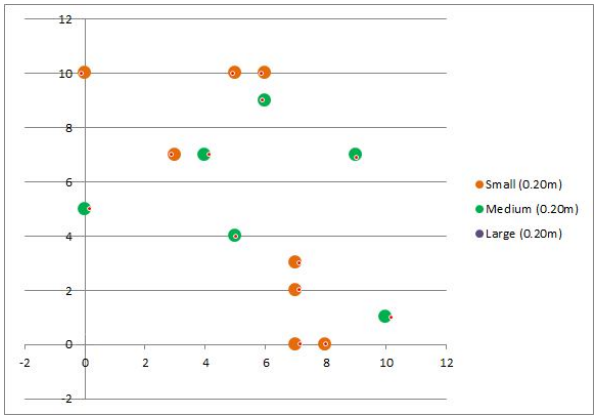
Large (0.20m)

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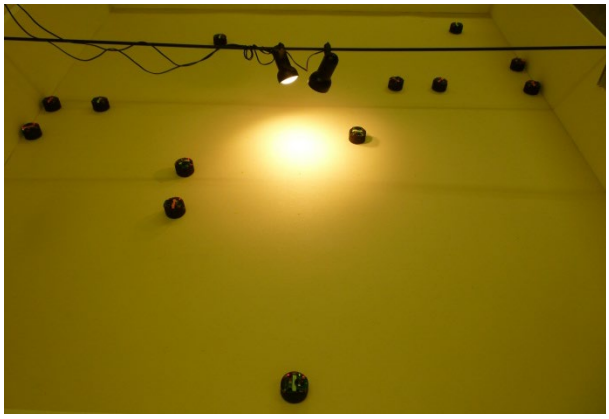
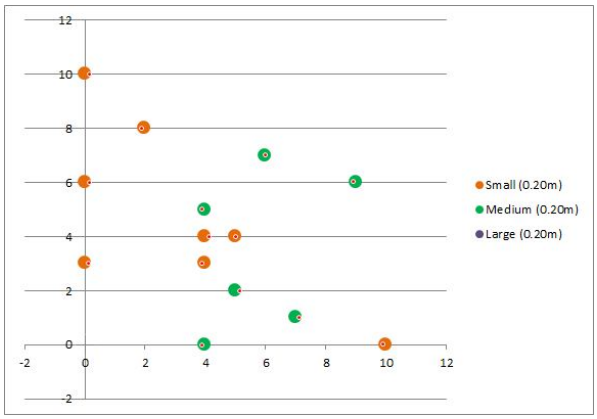
Medium (0.20m)
Large (0.20m)





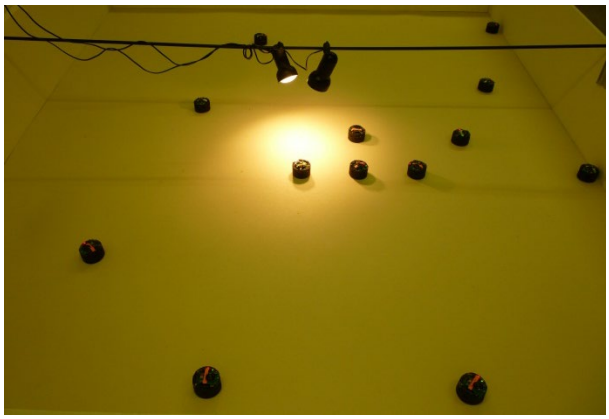
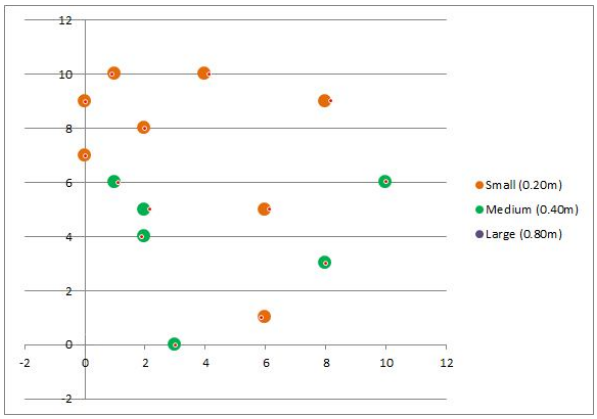
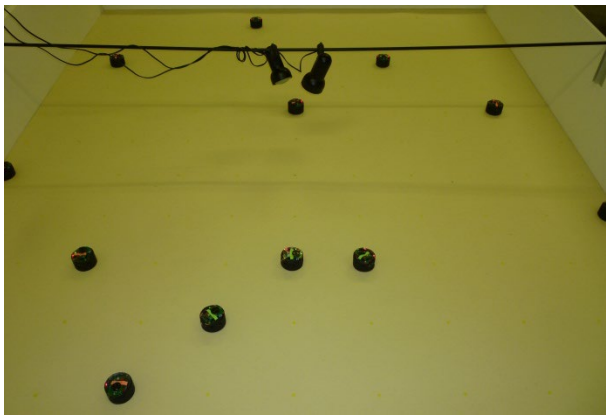
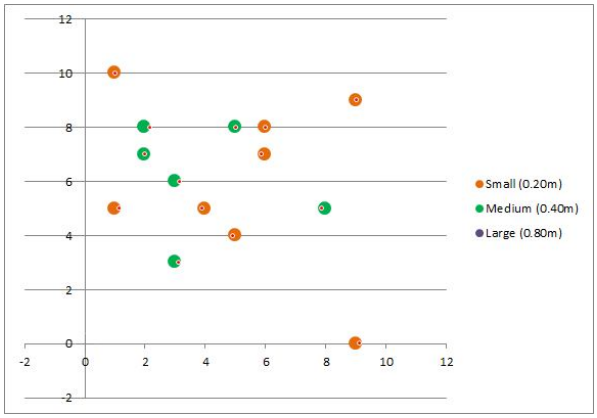
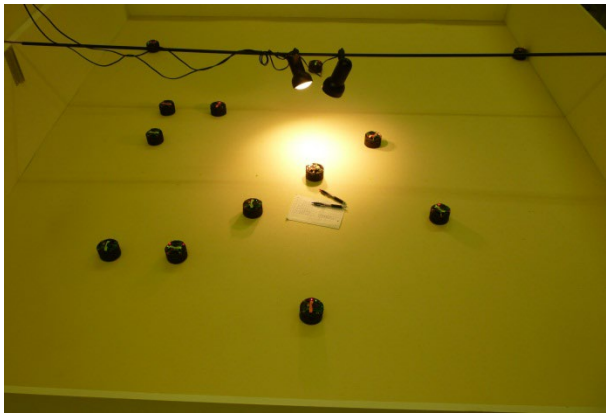



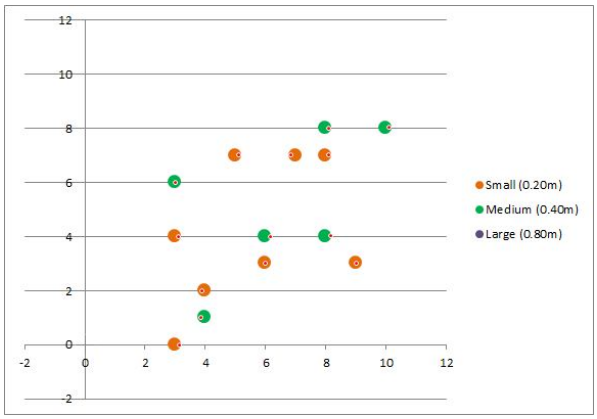
**Figure 0.II: Experiment 2 Starting Positions (A-E)**

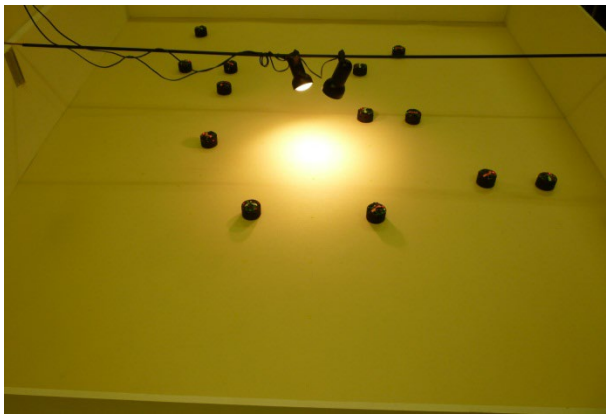


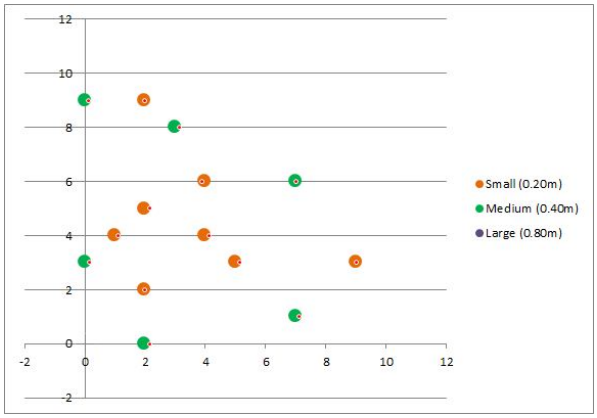



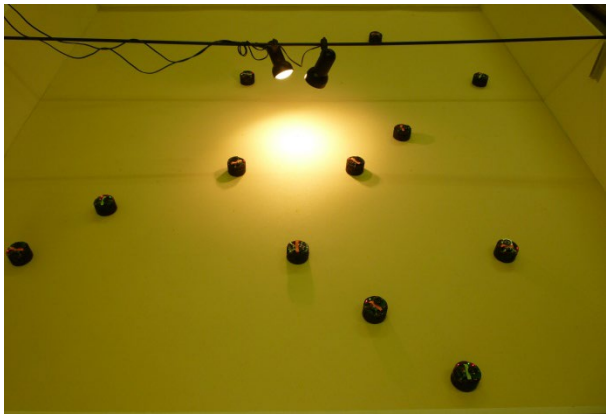


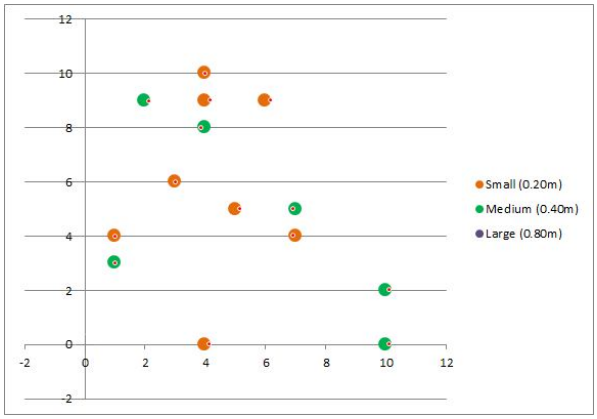













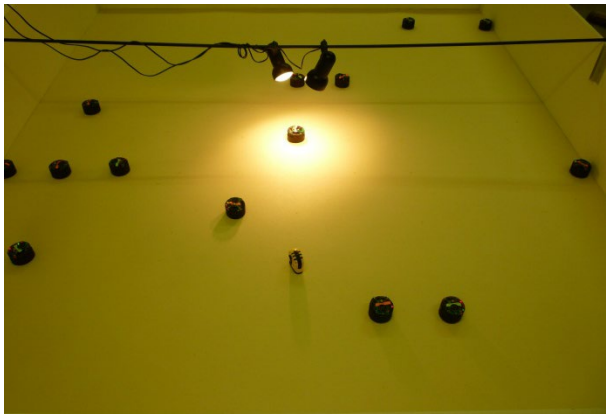
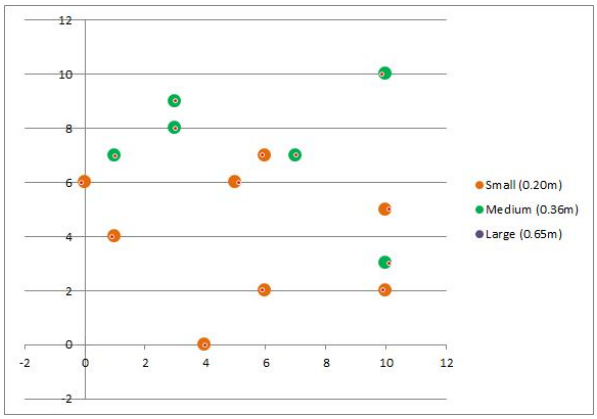


Figure 0.III: Experiment 3 Starting Positions (A-E)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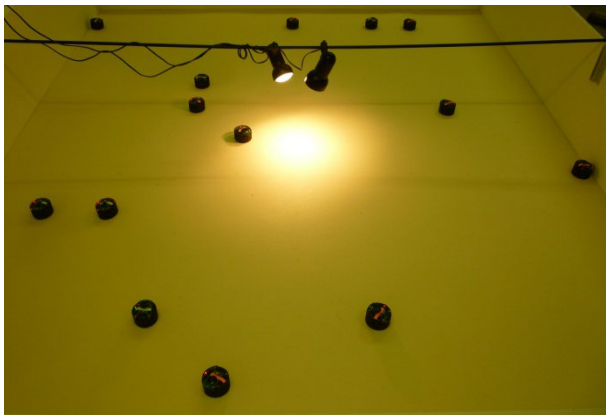
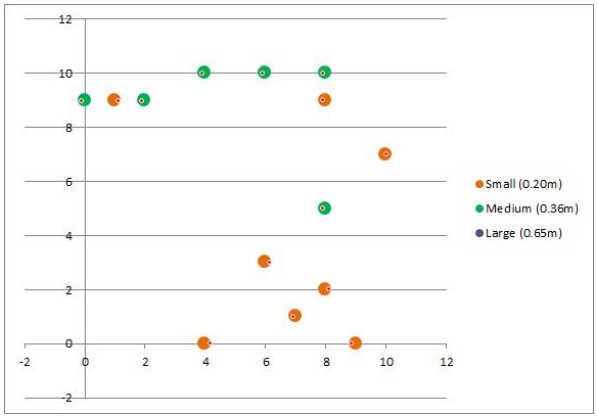
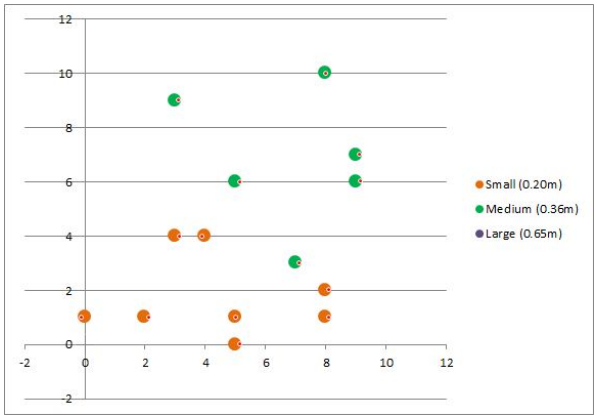
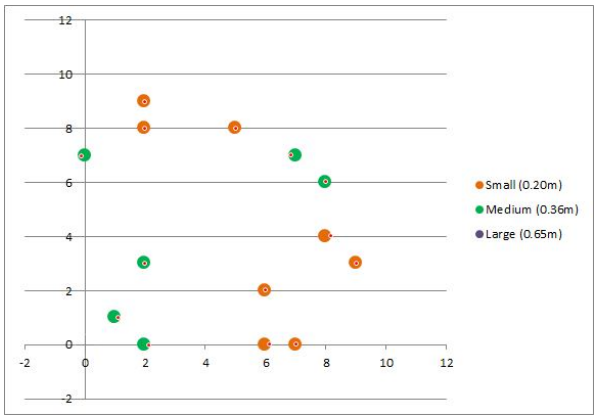
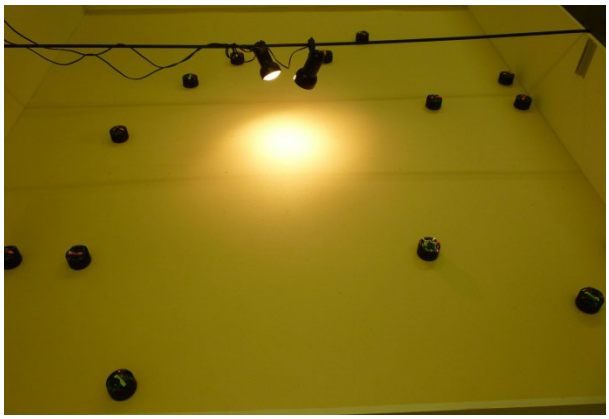
Medium (0.36m)
Large (0.65m)




Small (0.20m)
Medium (0.36m)
Large (0.65m)


Small (0.20m)
Medium (0.36m)
Large (0.65m)



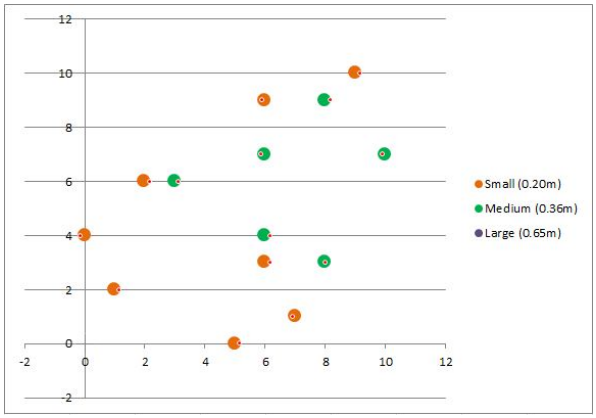
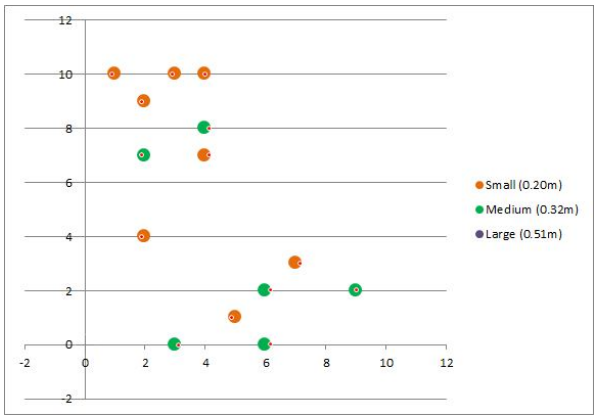
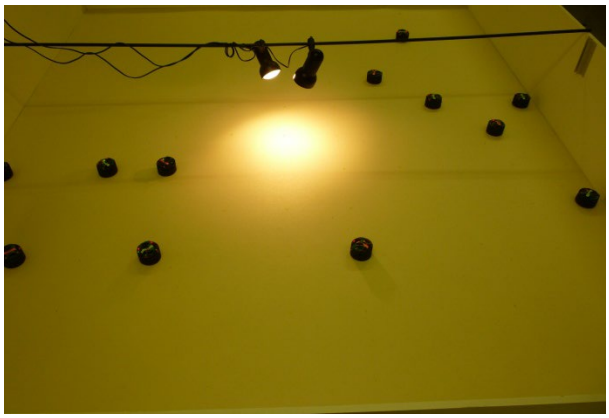
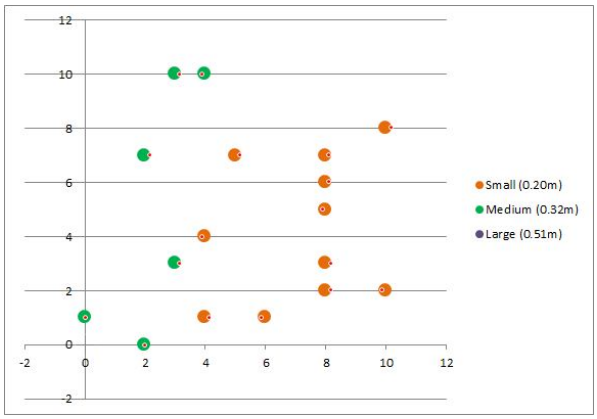
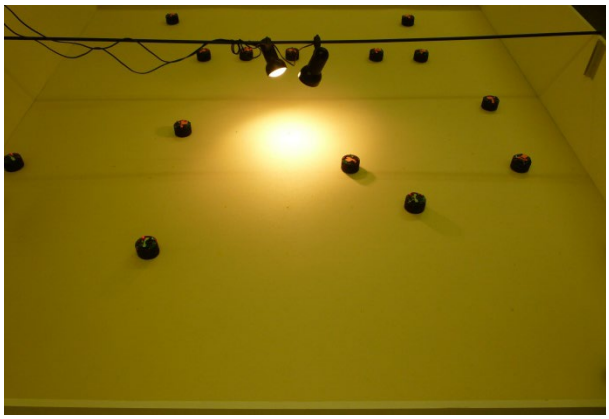


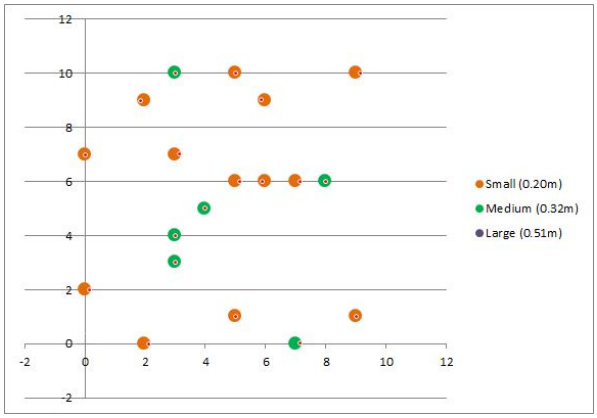

**Figure 0.IV: Experiment 4 Starting Positions (A-E)**

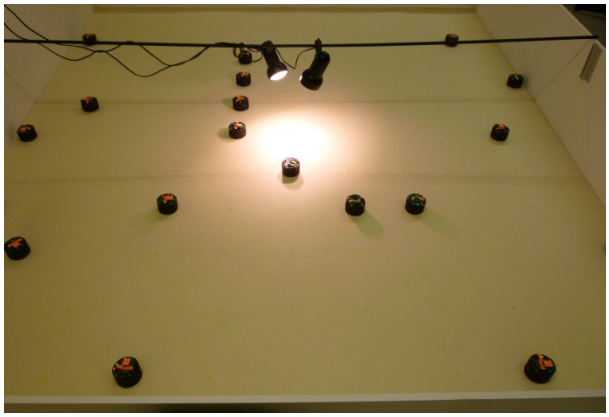


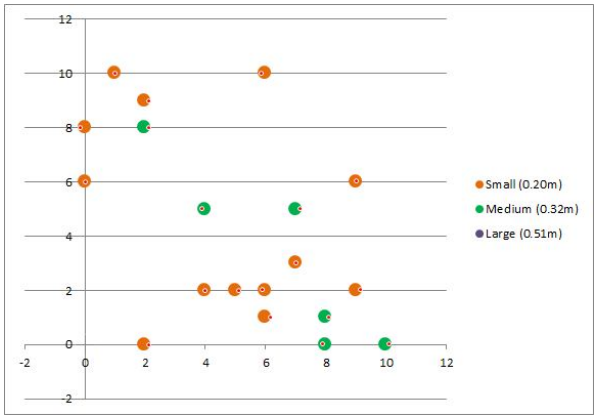




Small (0.20m)
Medium (0.32m)
Large (0.51m)




Small (0.20m)
Medium (0.32m)
Large (0.51m)

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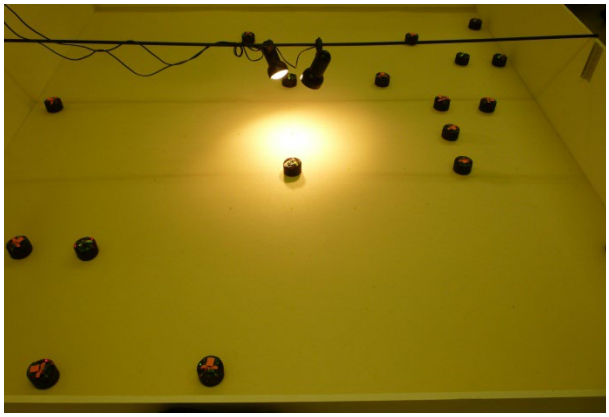
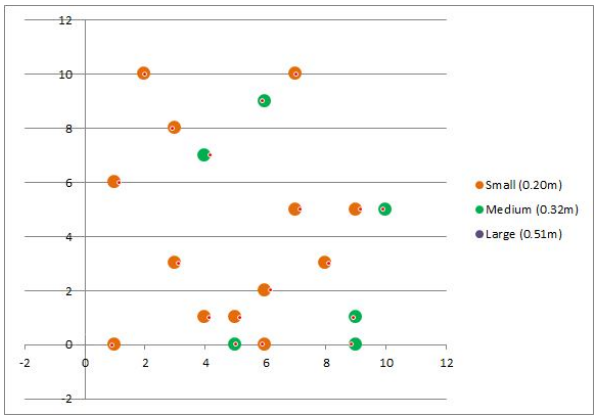
Medium (0.32m)
Large (0.51m)





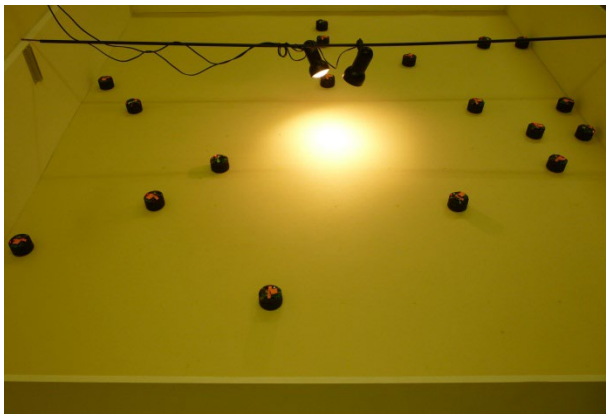
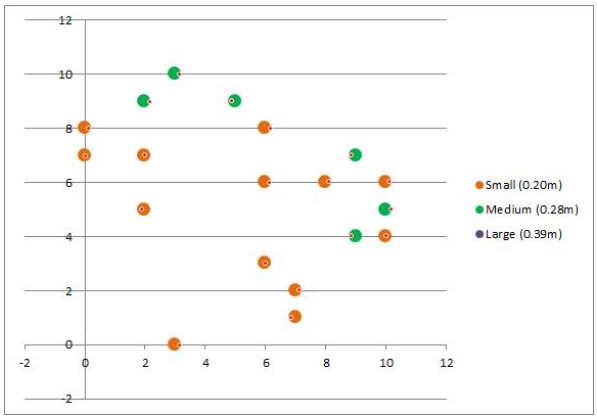
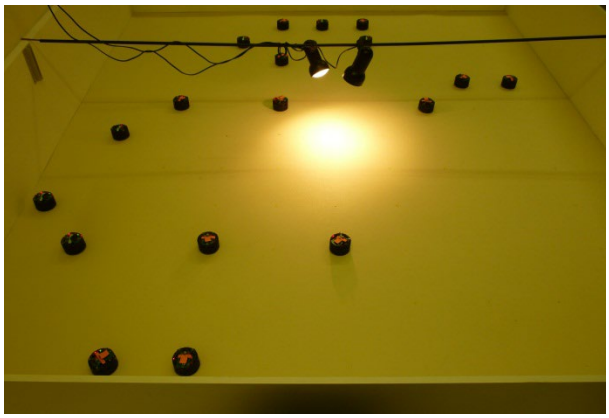
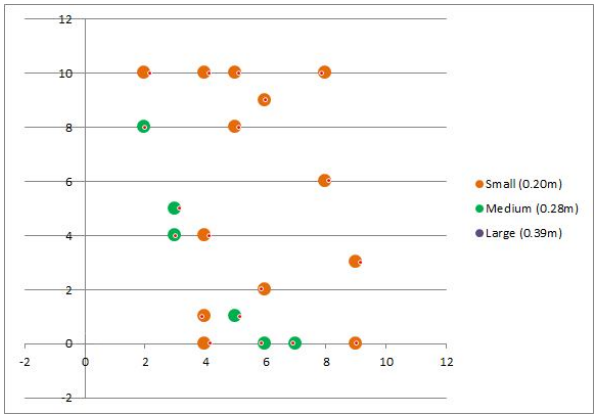
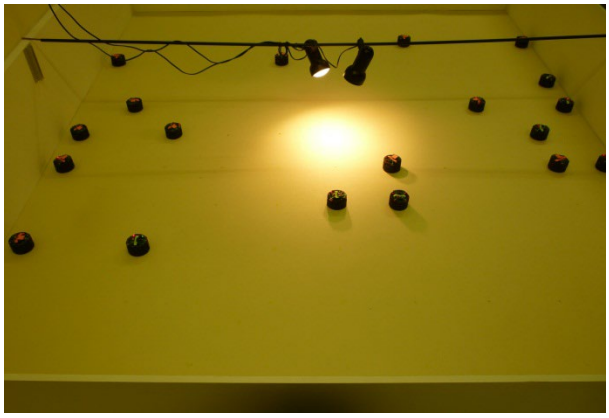



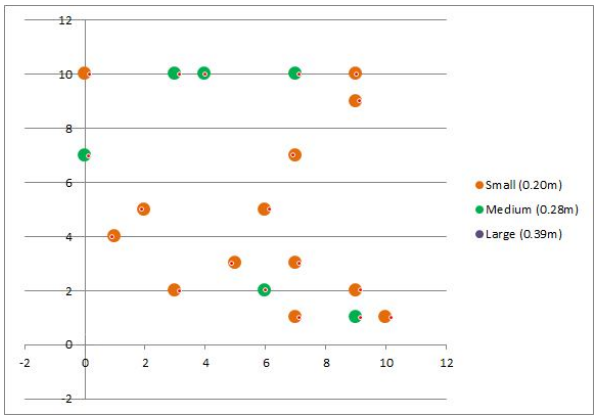
**Figure 0.V: Experiment 5 Starting Positions (A-E)**

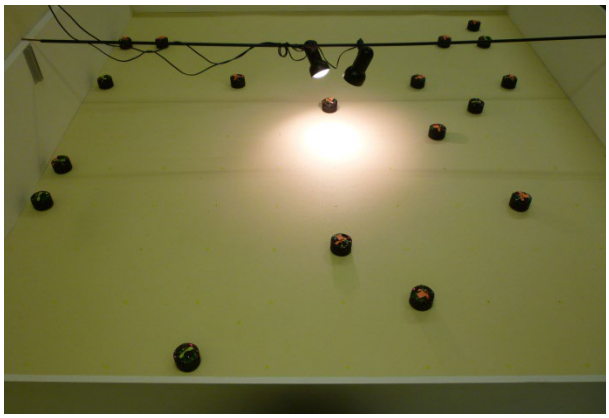


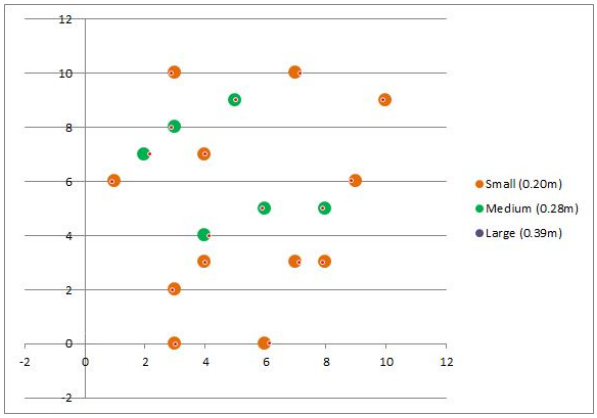



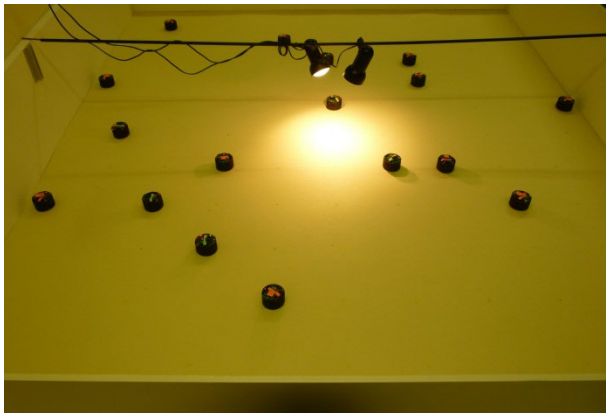


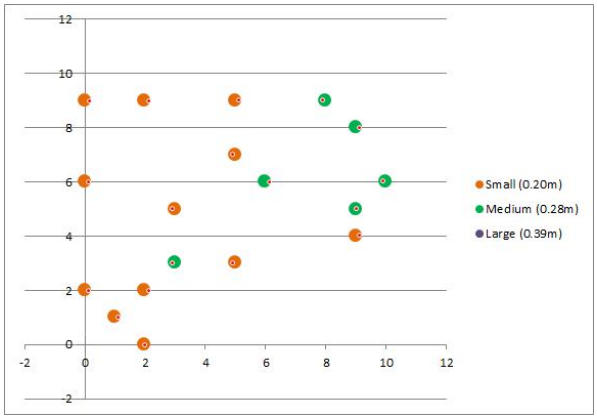













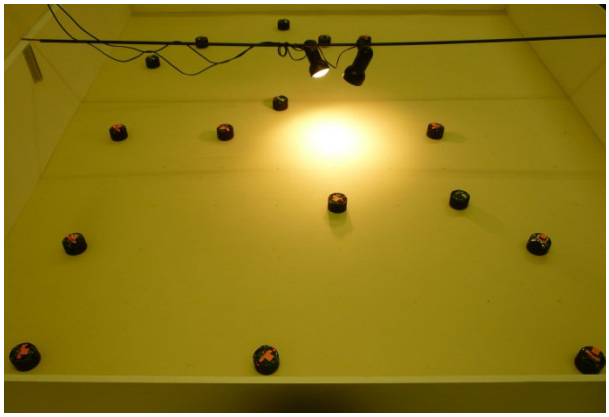
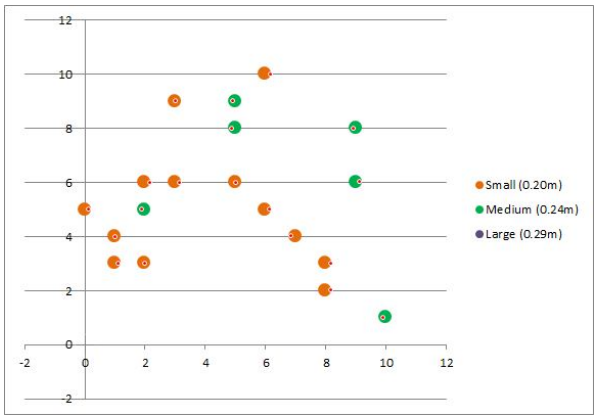
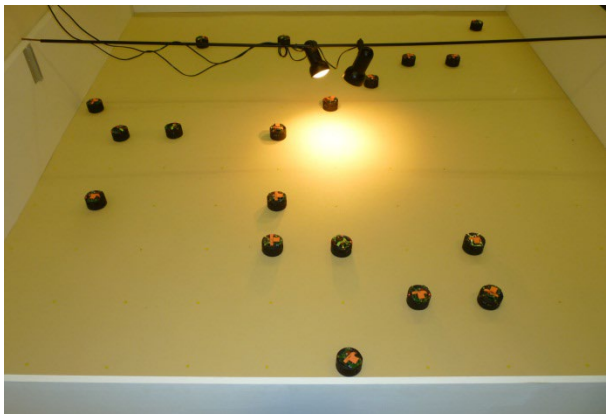
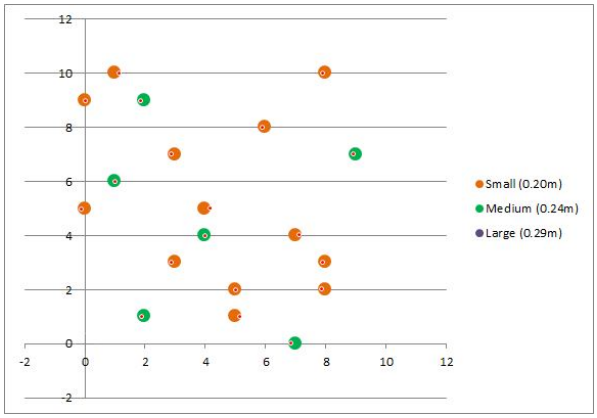
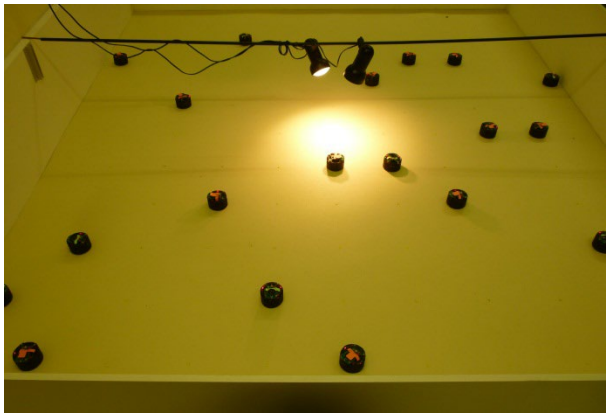


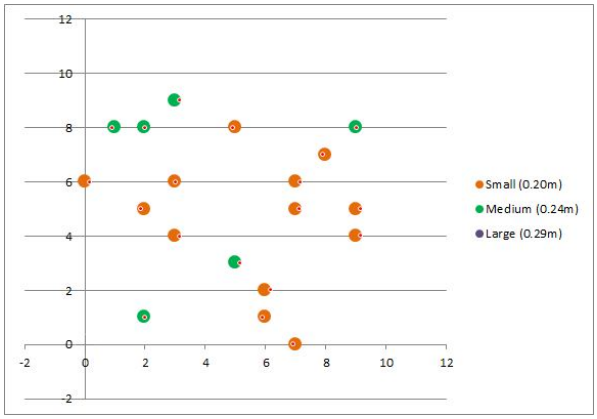
Figure 0.VI: Experiment 6 Starting Positions (A-E)

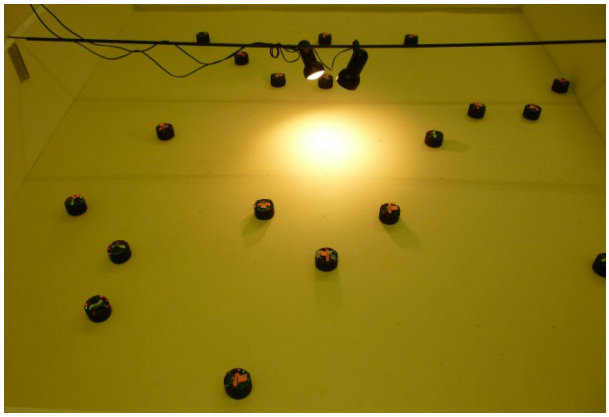

Small (0.20m)
Medium (0.24m)
Large (0.29m)

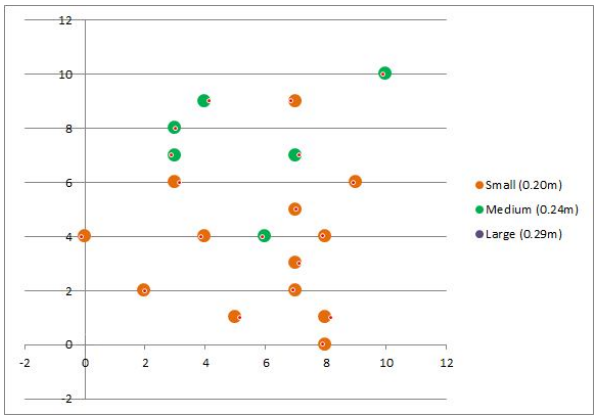


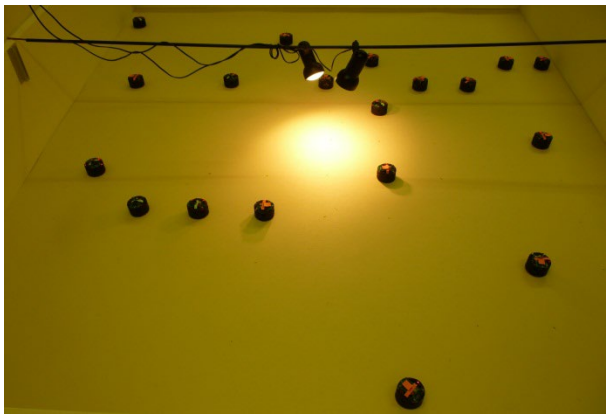

Small (0.20m)
Medium (0.24m)
Large (0.29m)

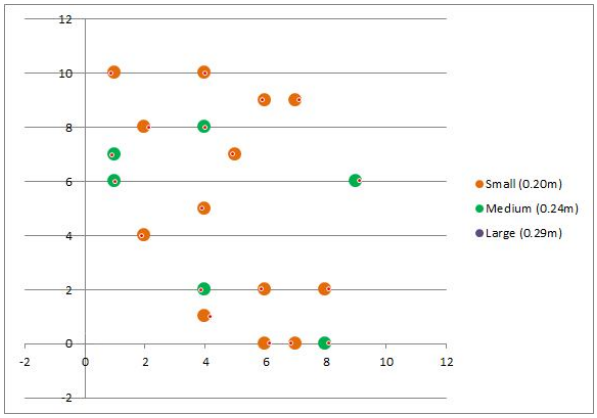



Small (0.20m)
Medium (0.24m)
Large (0.29m)







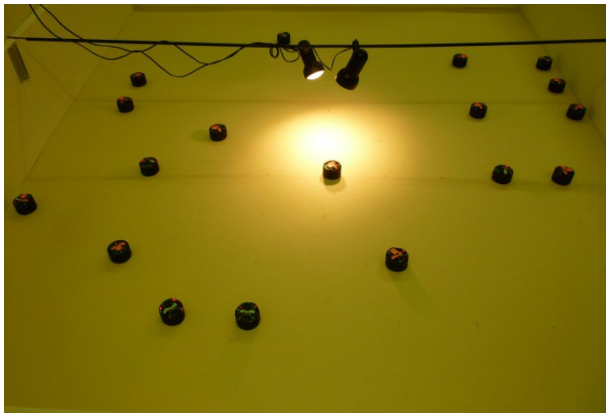
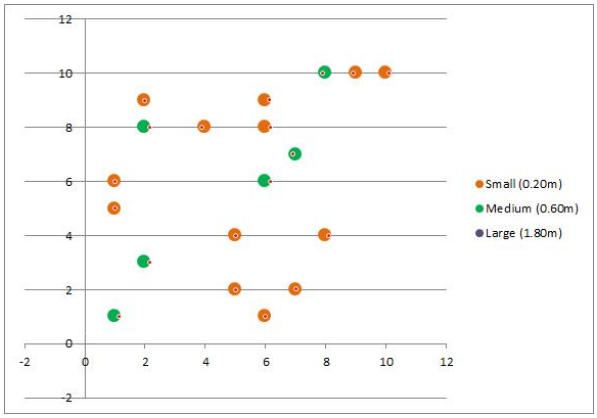
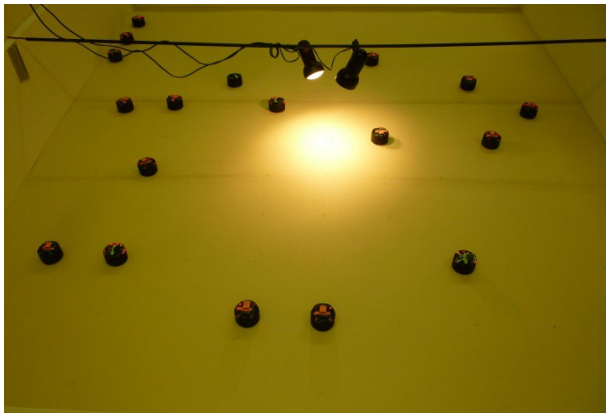
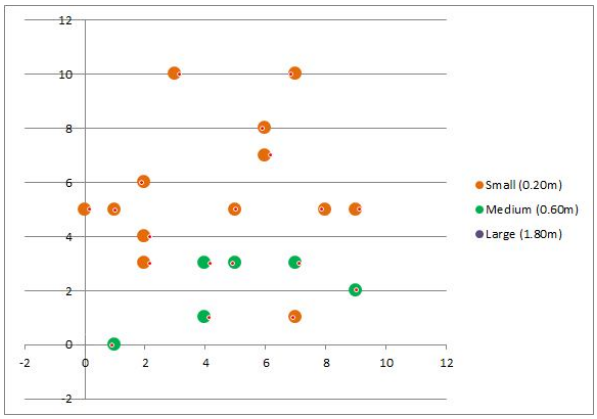
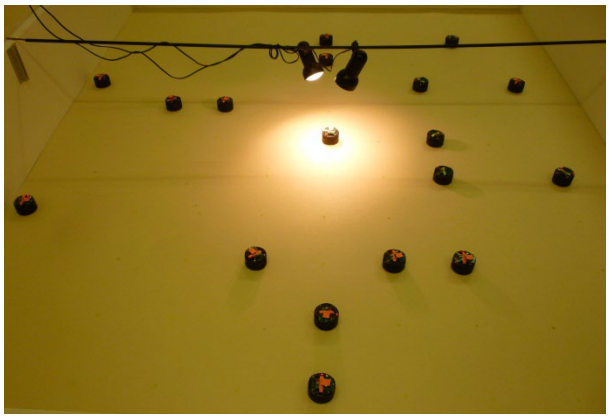



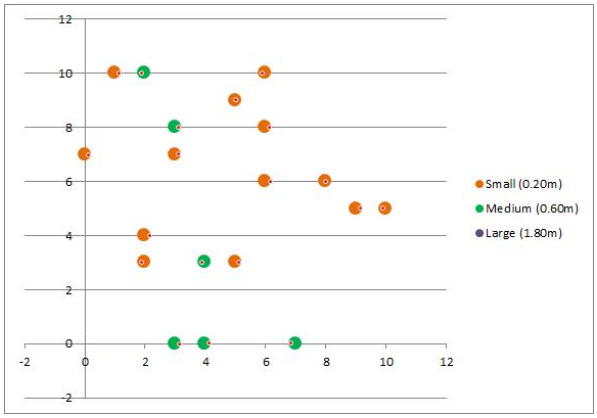
**Figure 0.VII: Experiment 7 Starting Positions (A-E)**

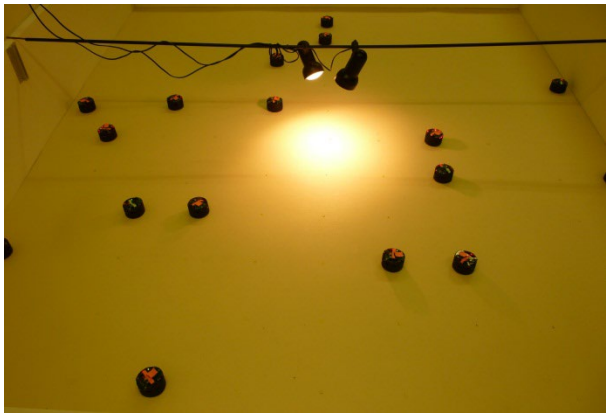


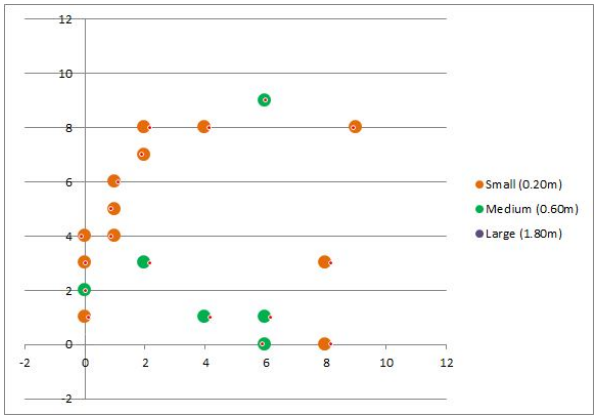



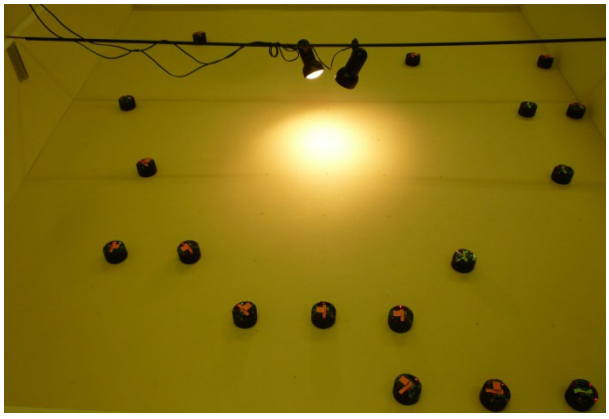

Small (0.20m)
Medium (0.60m)
Large (1.80m)

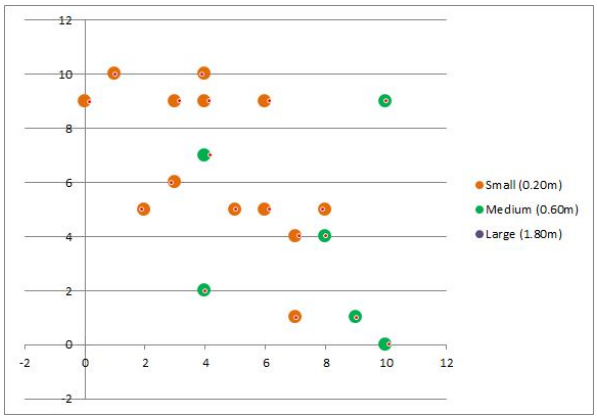



Small (0.20m)
Medium (0.60m)
Large (1.80m)




Small (0.20m)
Medium (0.60m)
Large (1.80m)





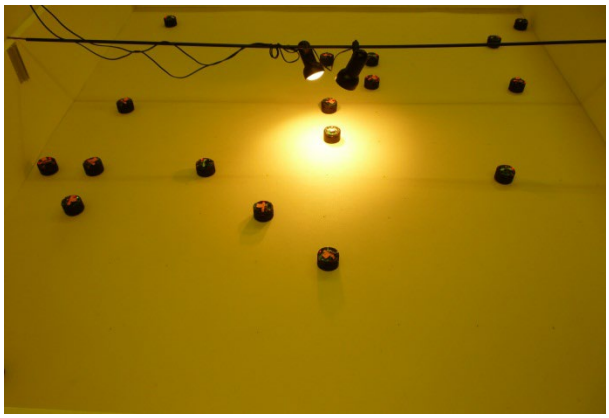
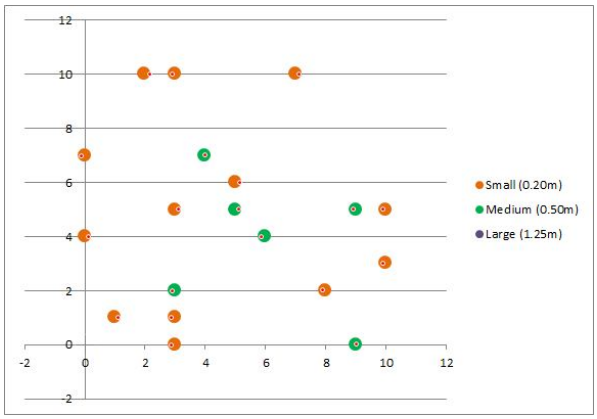
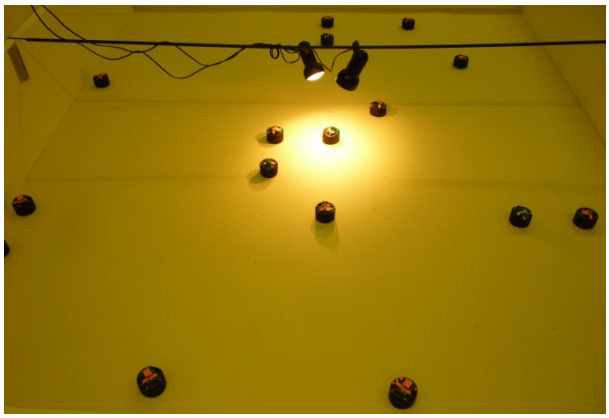
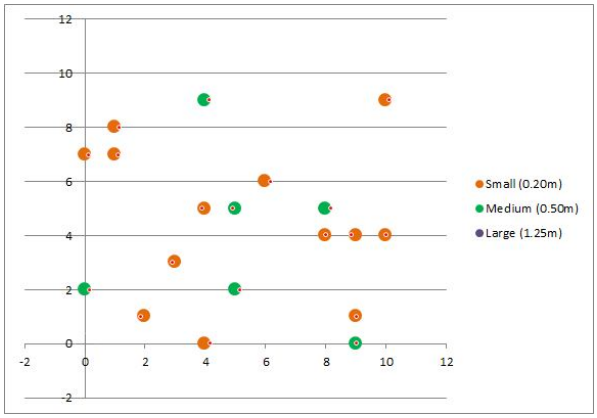
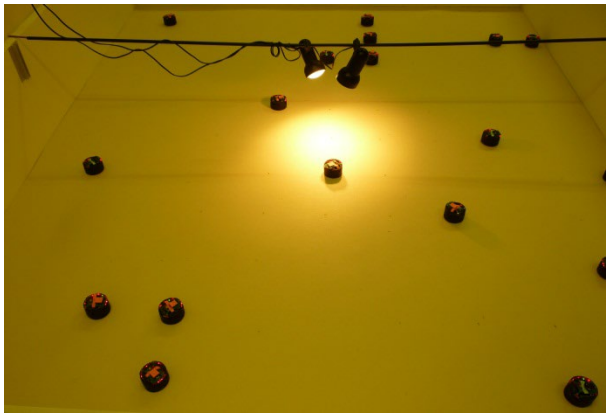



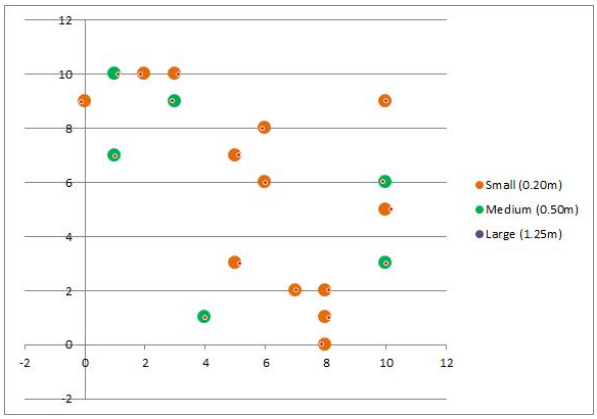
**Figure 0.VIII: Experiment 8 Starting Positions (A-E)**

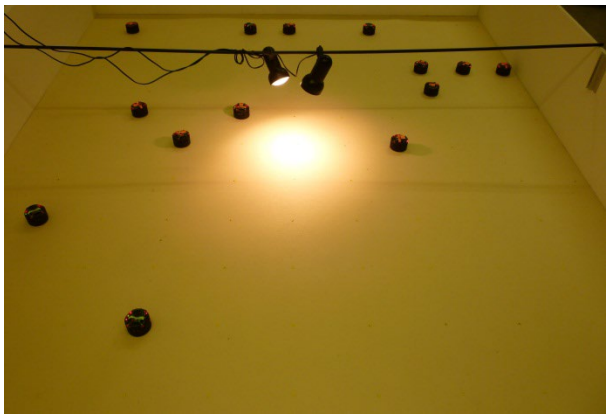


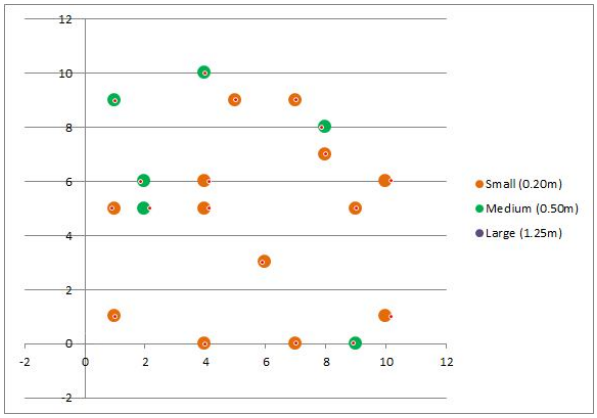



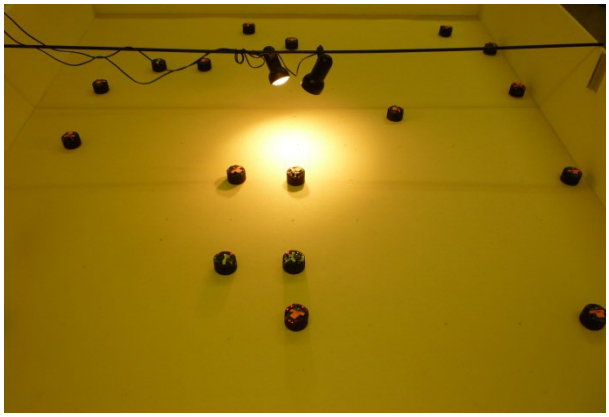










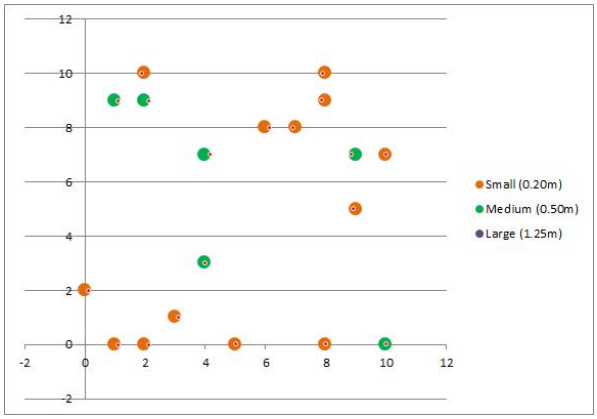
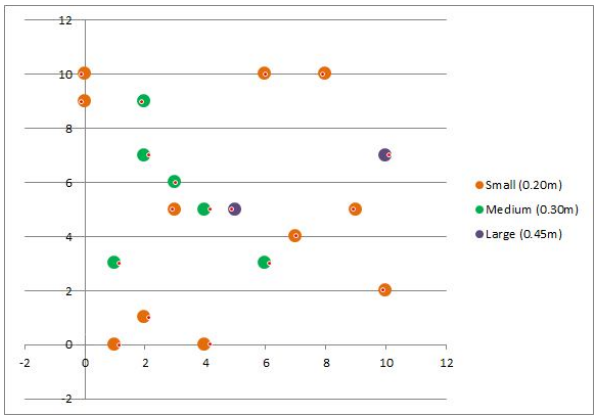
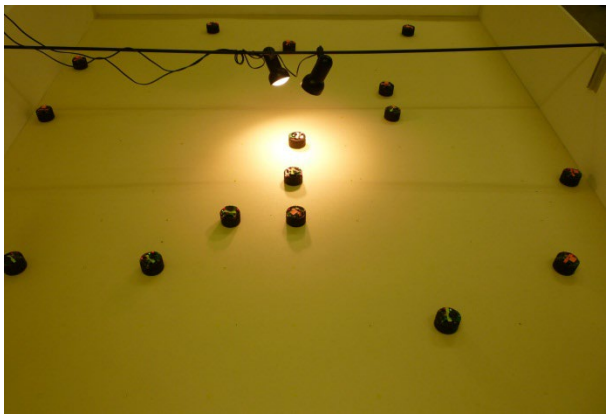
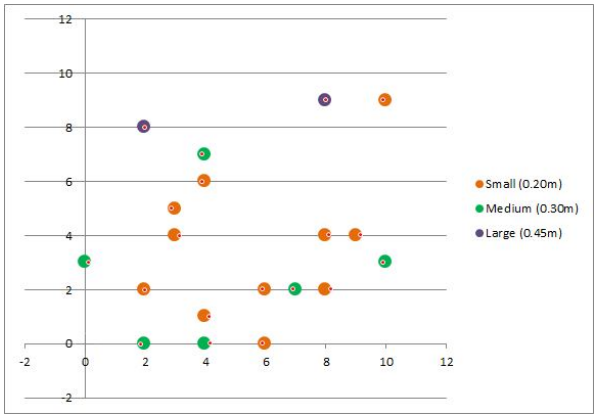
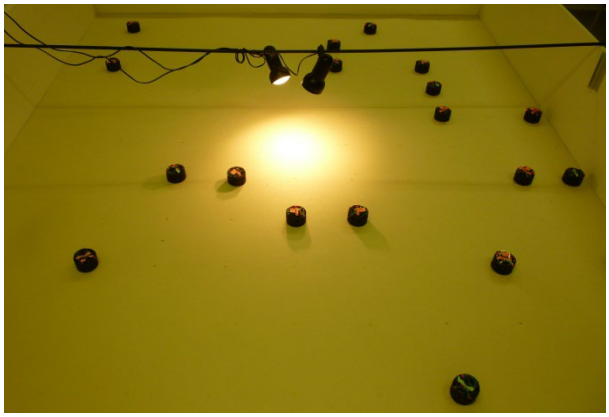


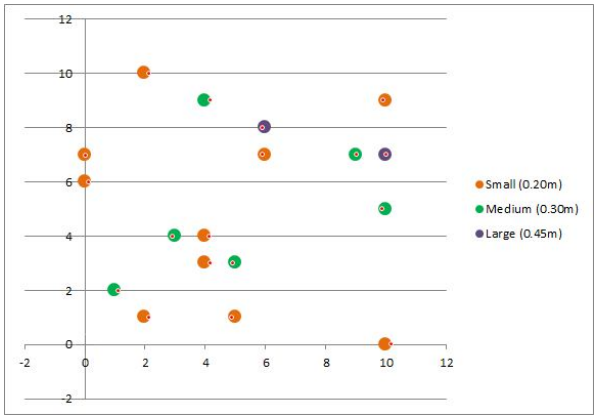
Figure 0.IX: Experiment 9 Starting Positions (A-E)

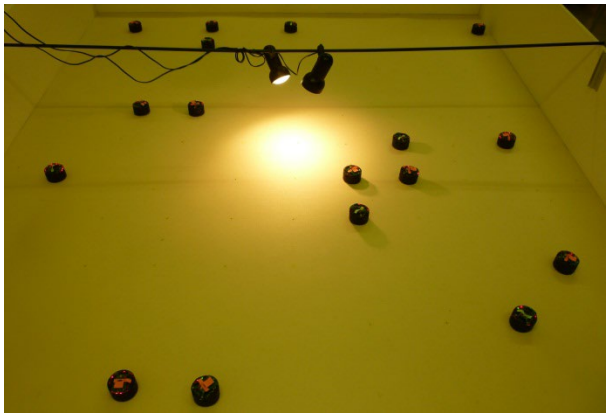

Small (0.20m)
Medium (0.30m)
Large (0.45m)

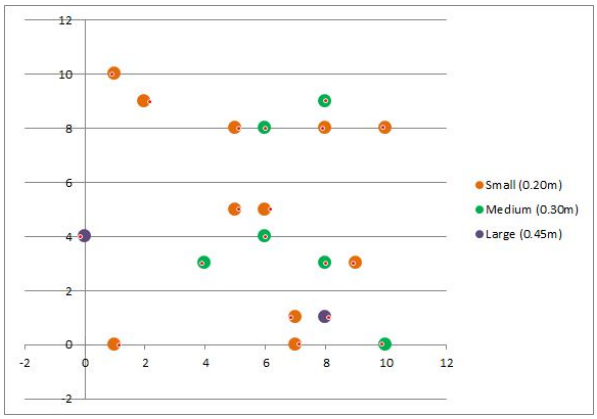


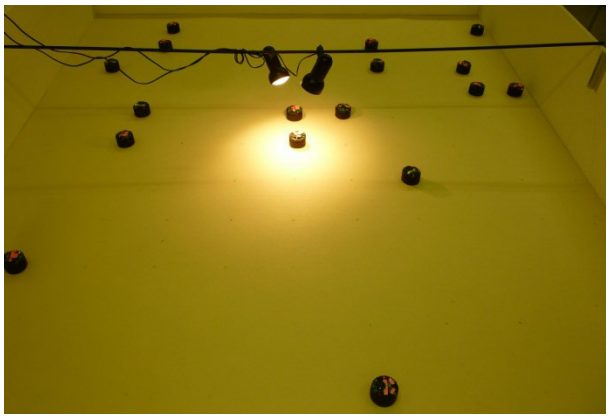

Small (0.20m)
Medium (0.30m)
Large (0.45m)

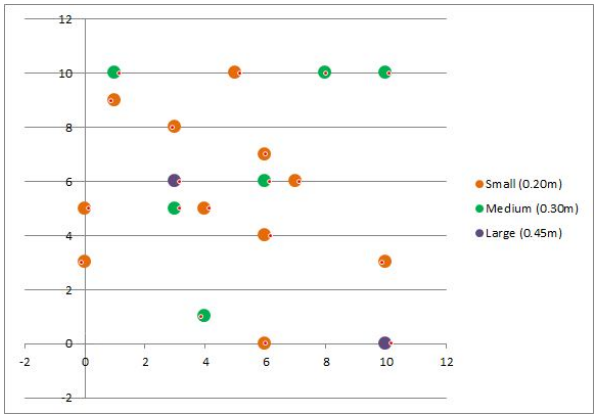



Small (0.20m)
Medium (0.30m)
Large (0.45m)







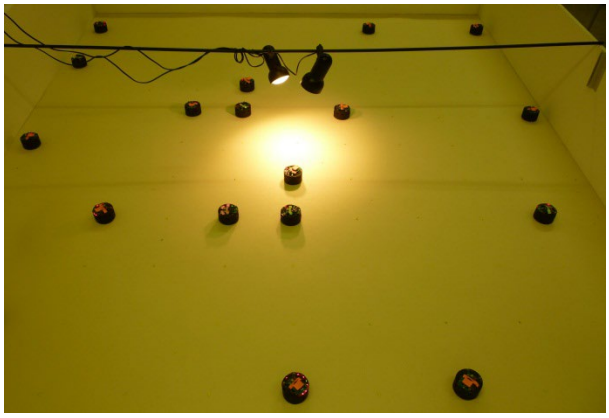



**Figure 0.X: Experiment 10 Starting Positions (A-E)**

## 1.2 EXPERIMENT FINAL SEGREGATION PATTERNS

The final segregation patterns for the corresponding ten experiments are shown below (note that where possible, these photographs have been taken with the lamps turned off in order to allow the different robot groups to be identified more easily, but versions of the images with the lamps left on are included with the supplementary electronic material).

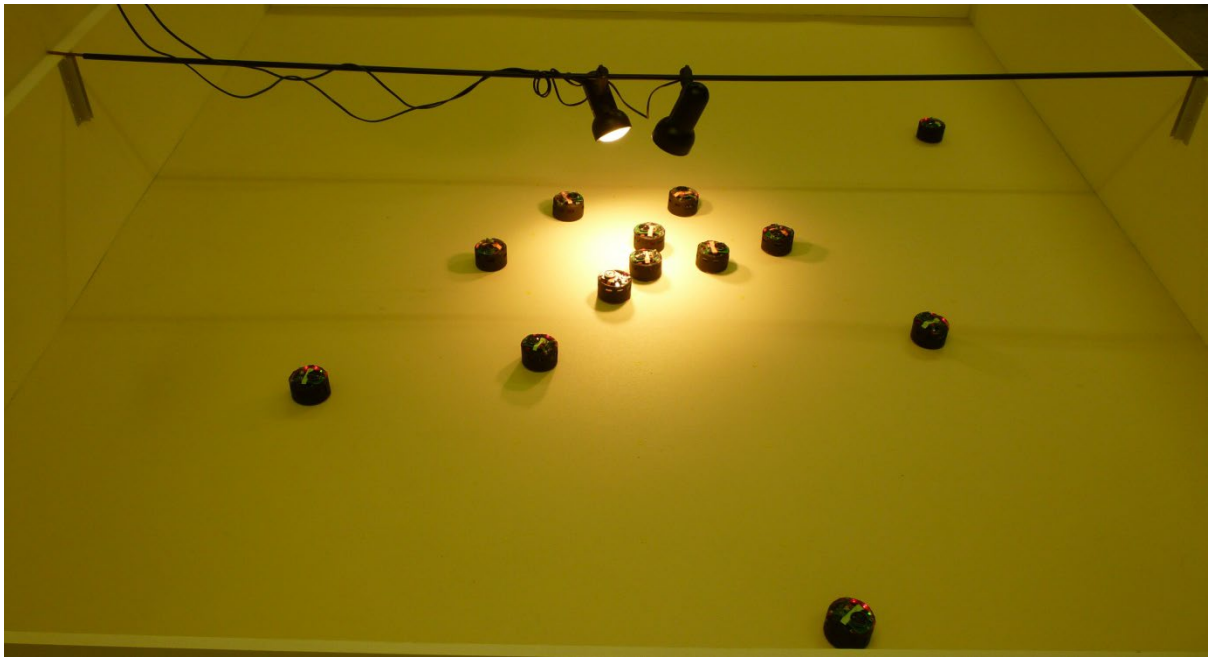
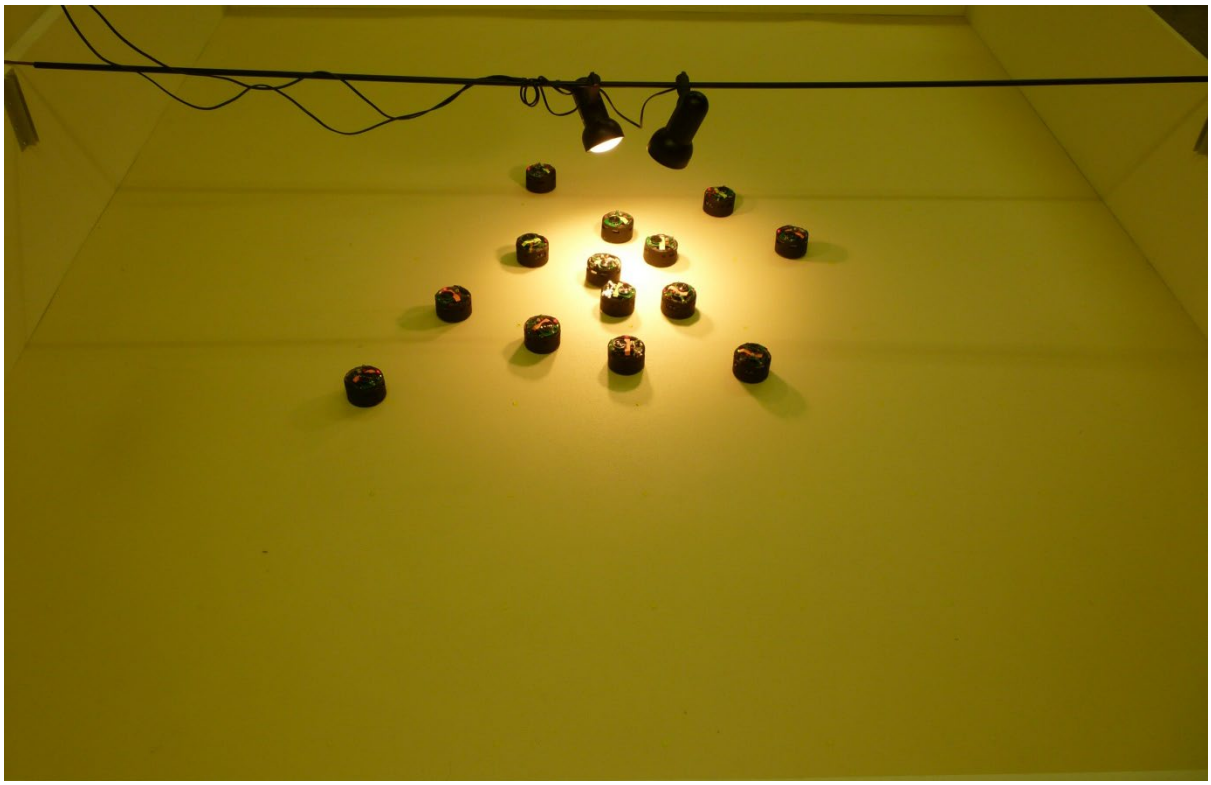
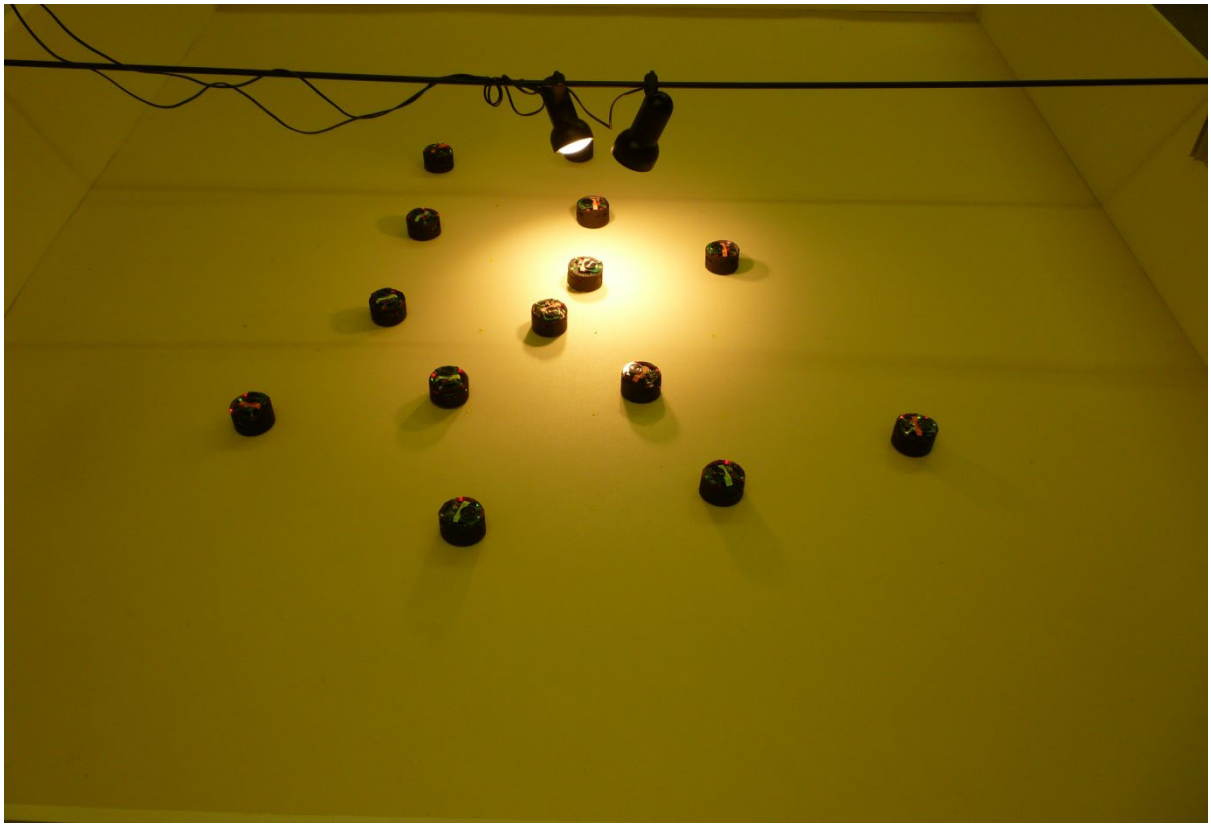
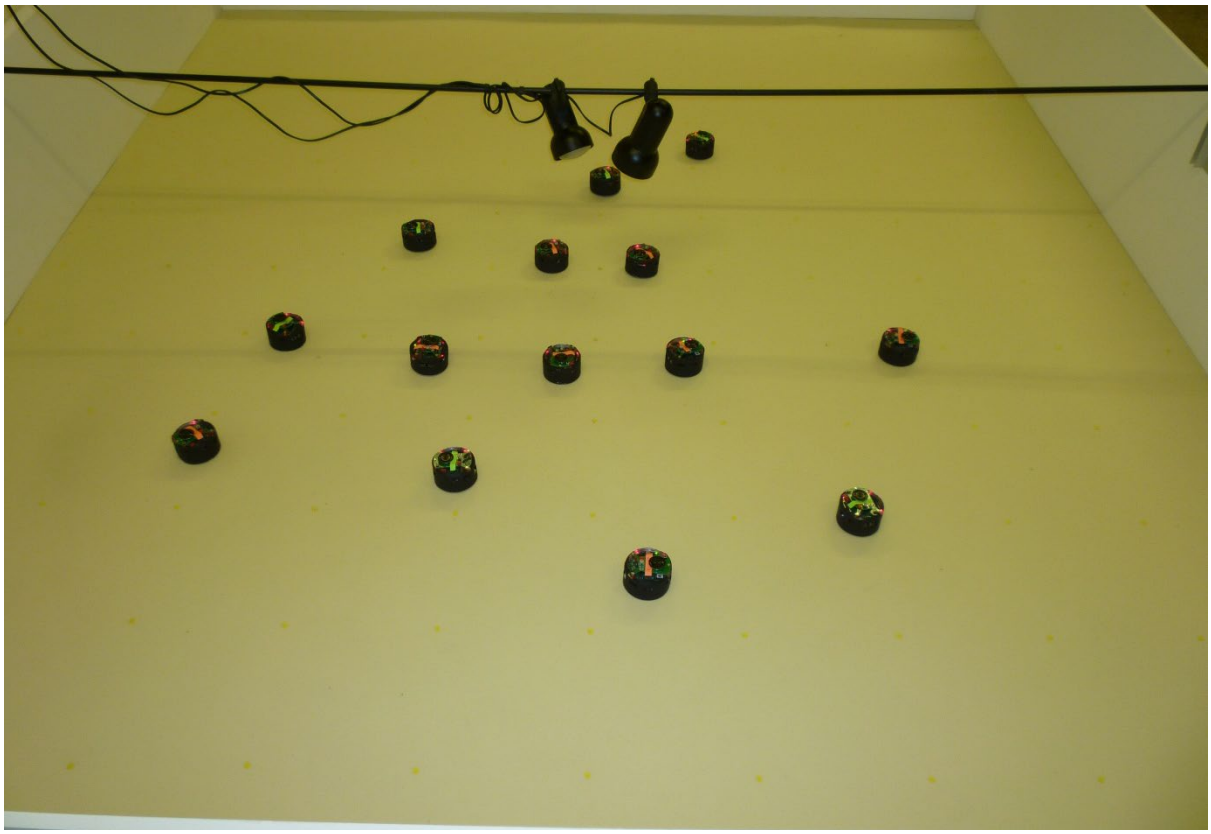


**Figure 0.XI: Experiment 1 Final Segregation Patterns (A-E)**







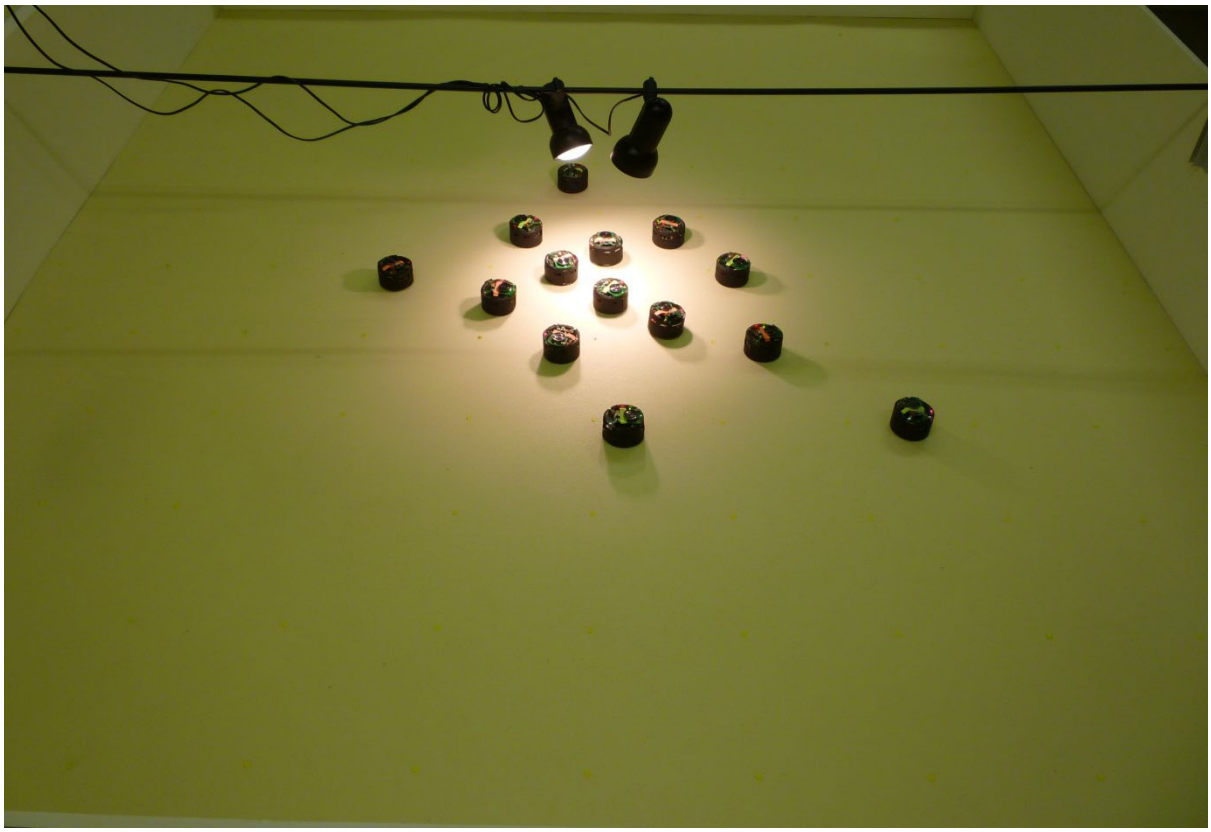
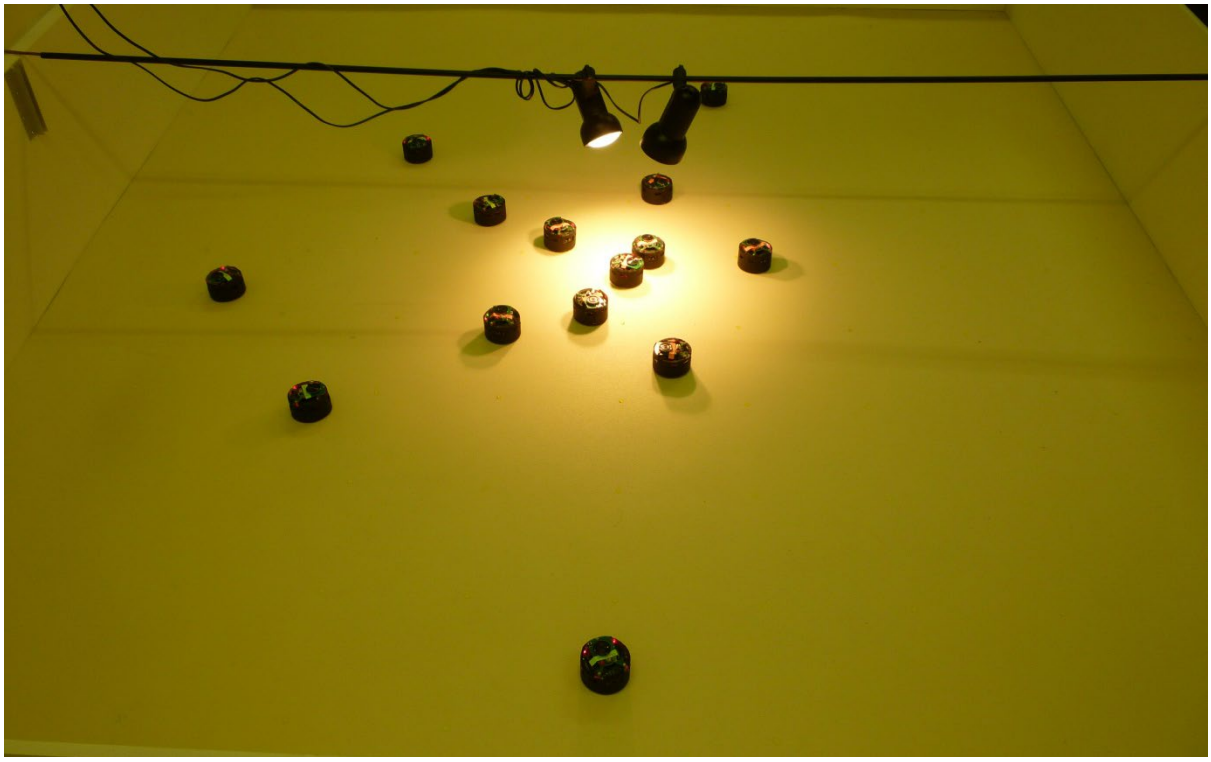
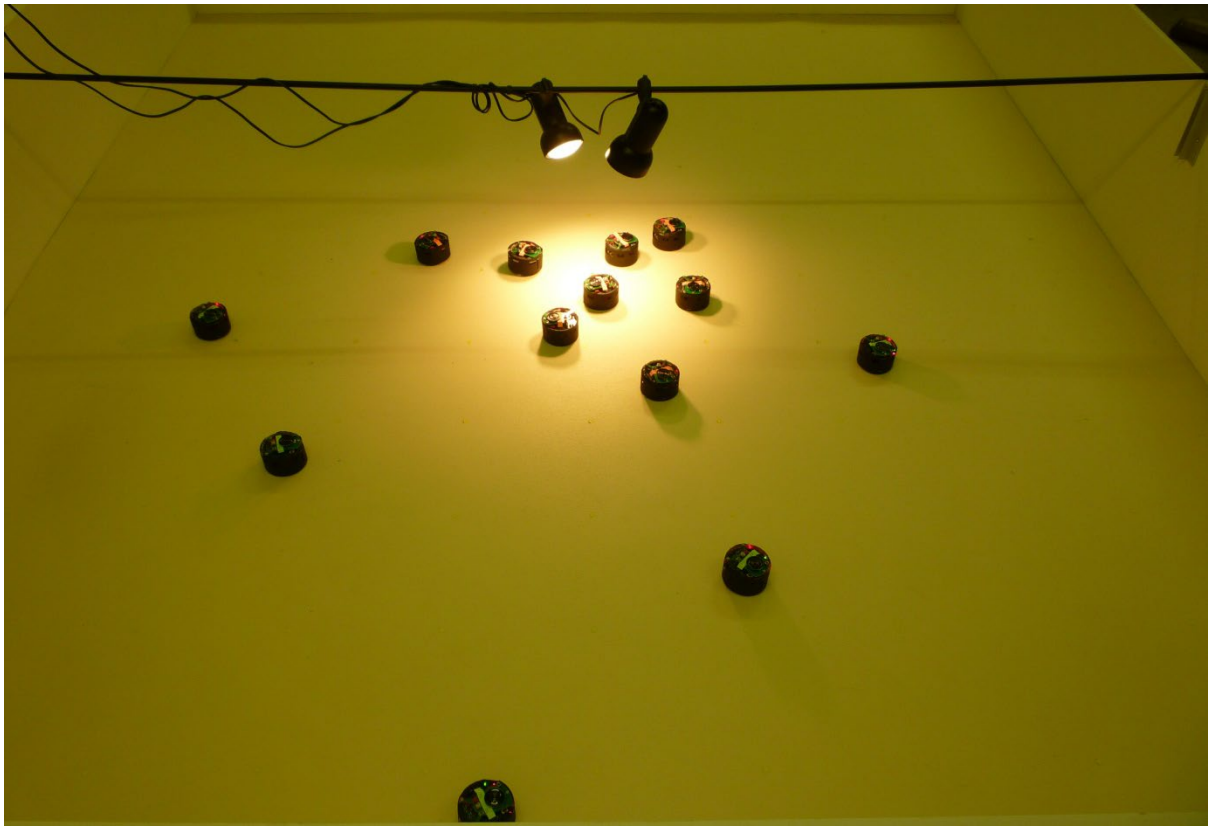


**Figure 0.XII: Experiment 2 Final Segregation Patterns (A-E)**





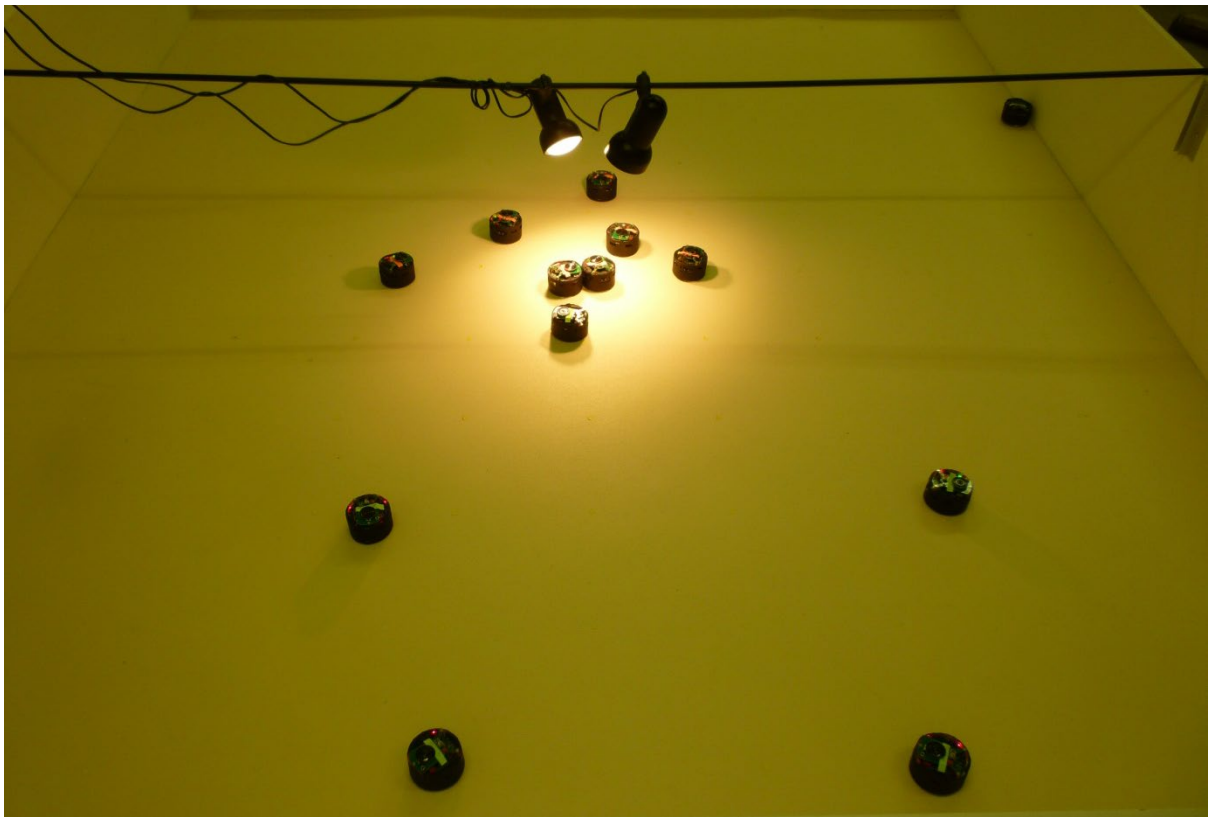
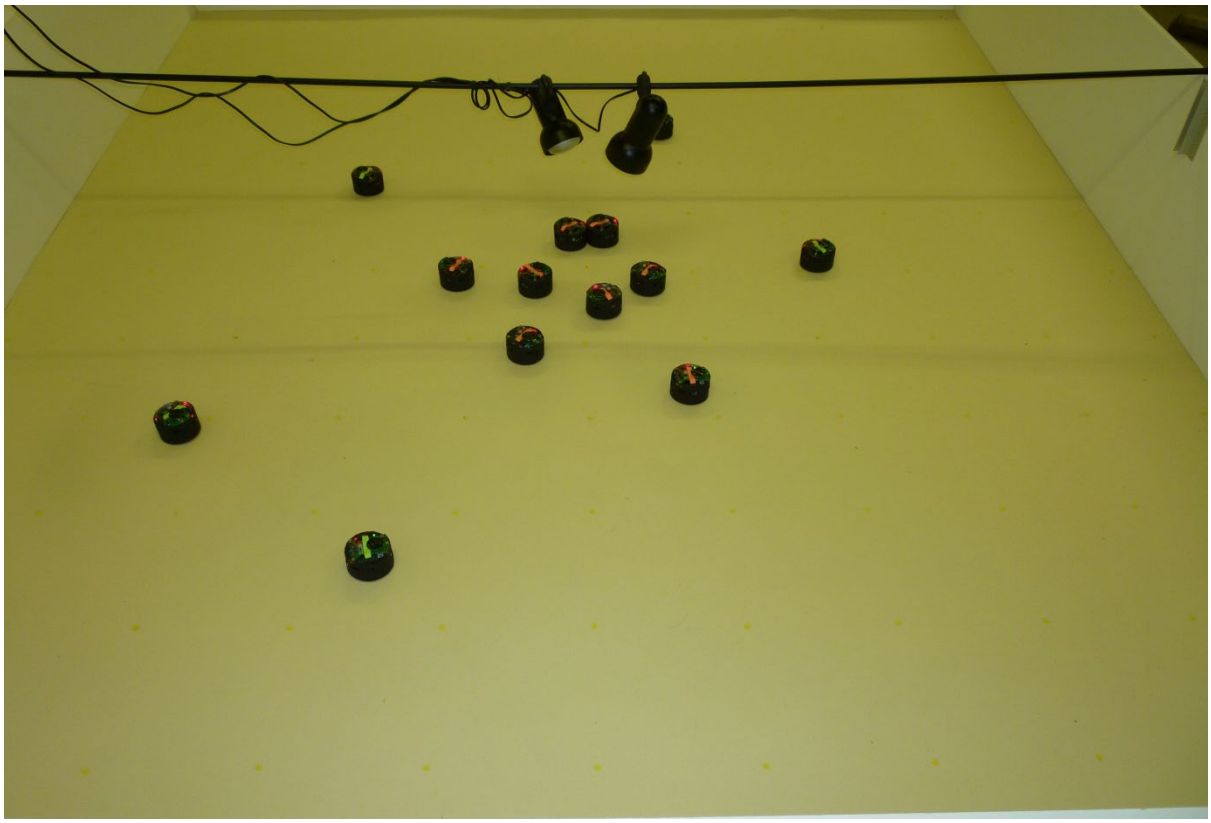
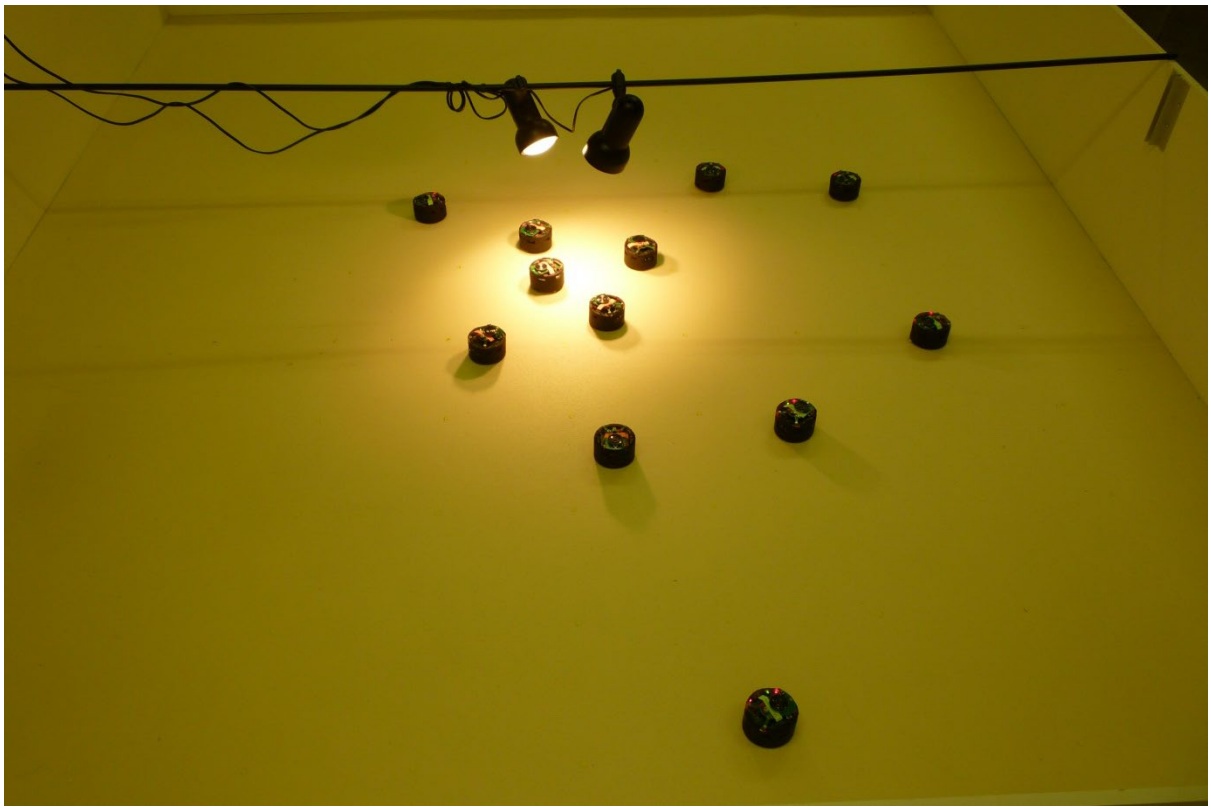
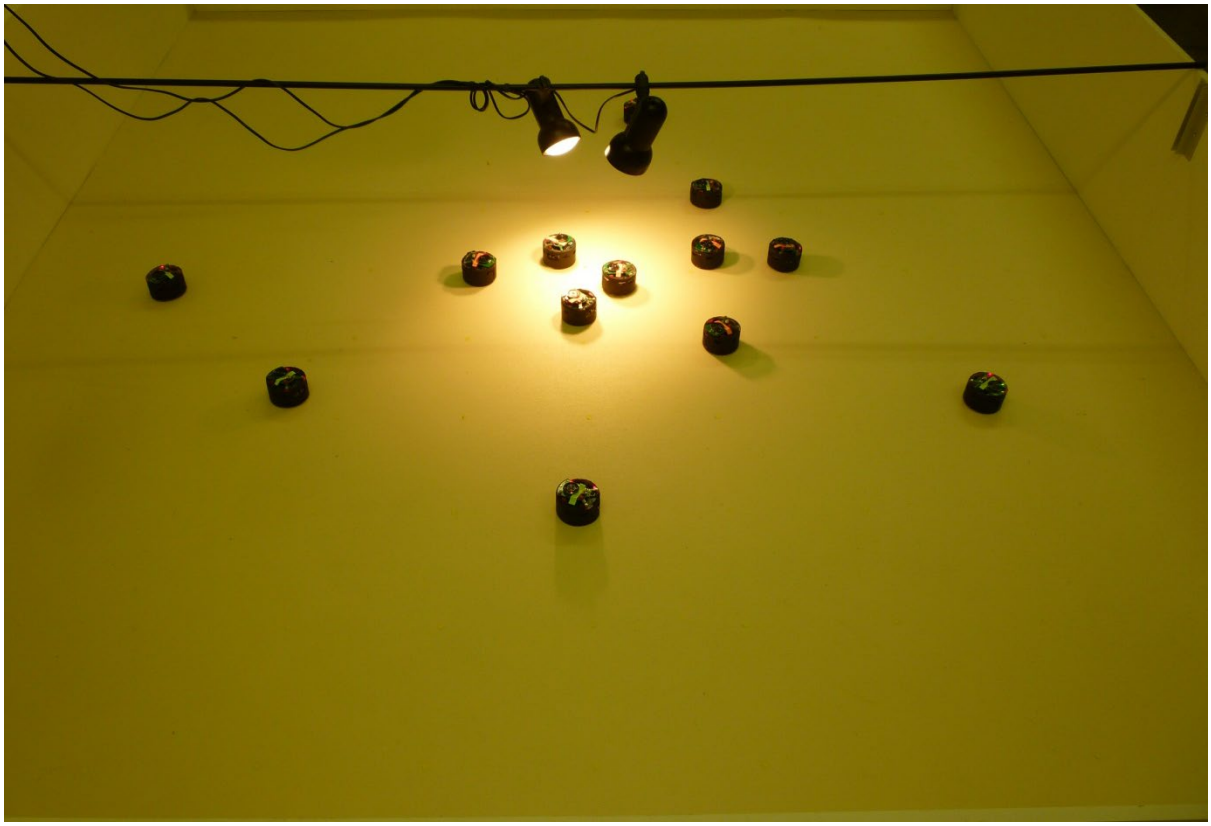


**Figure 0.XIII: Experiment 3 Final Segregation Patterns (A-E)**







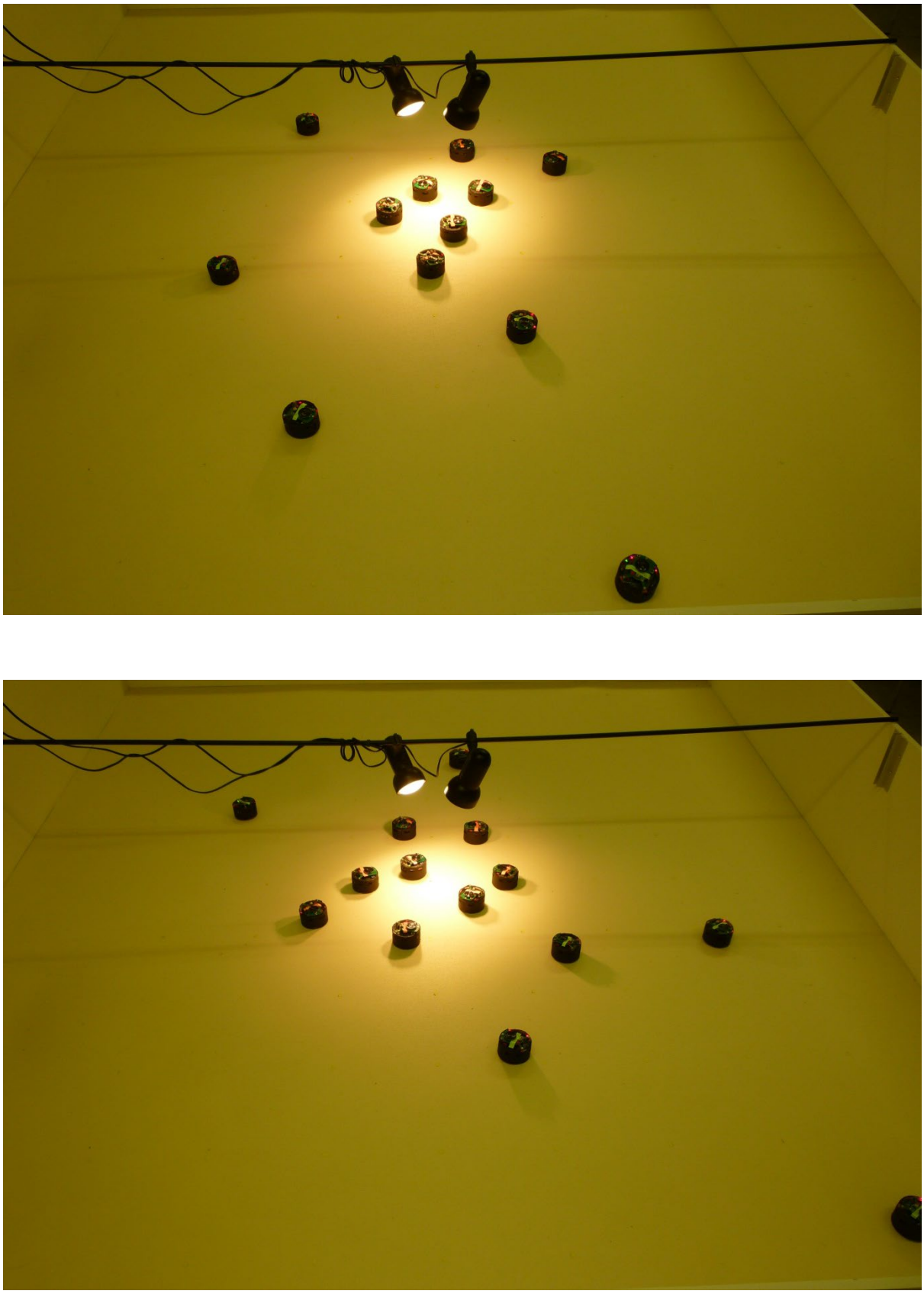
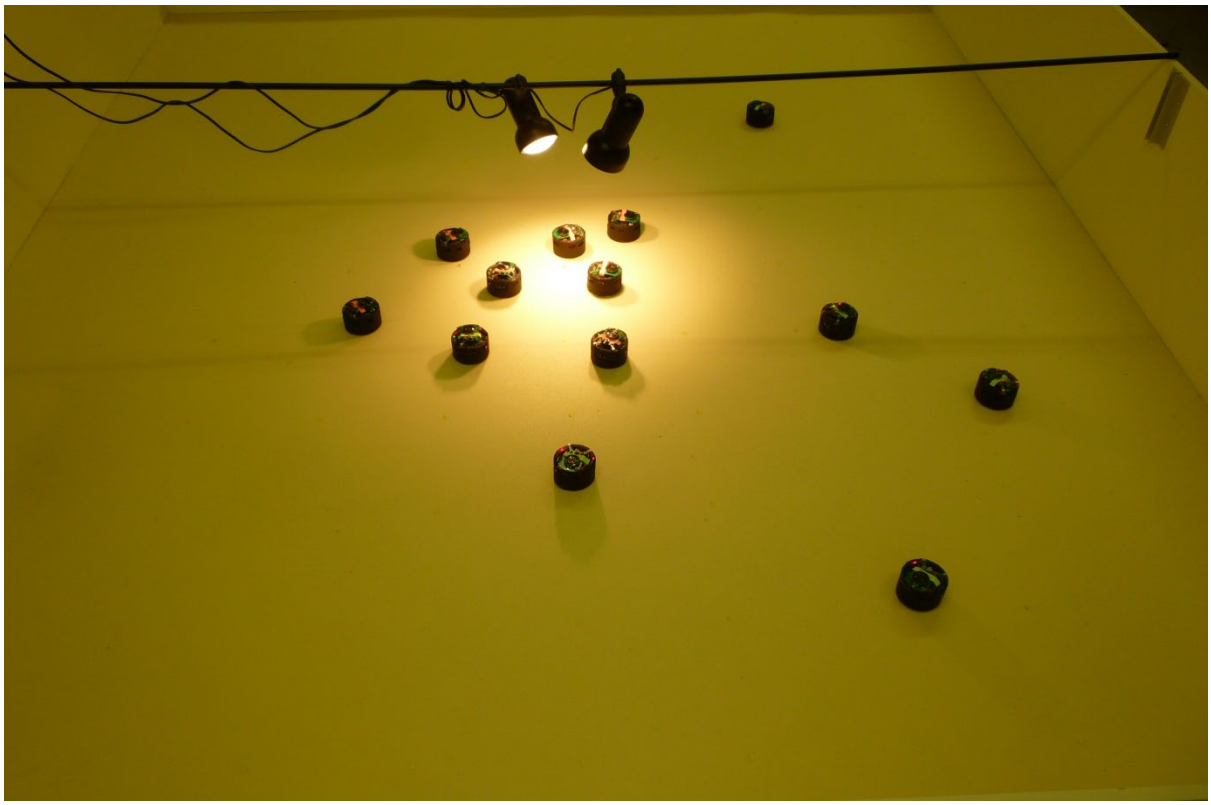
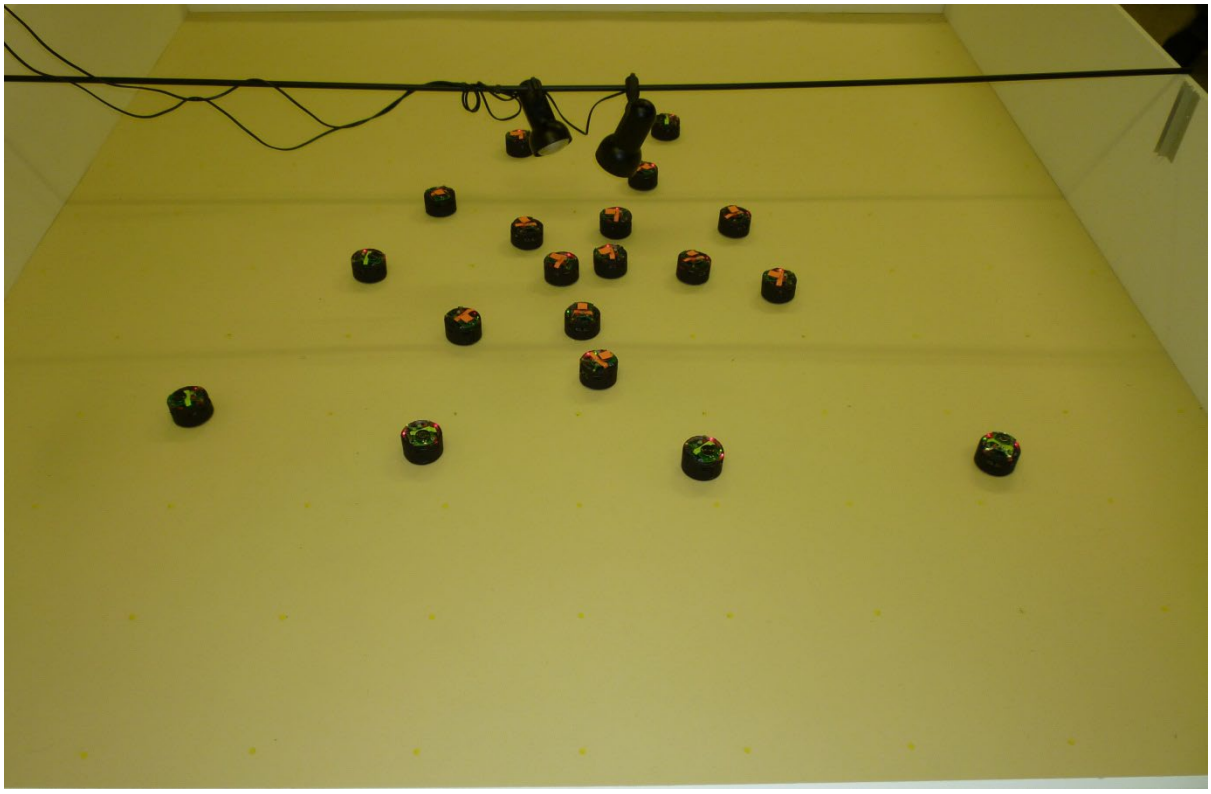
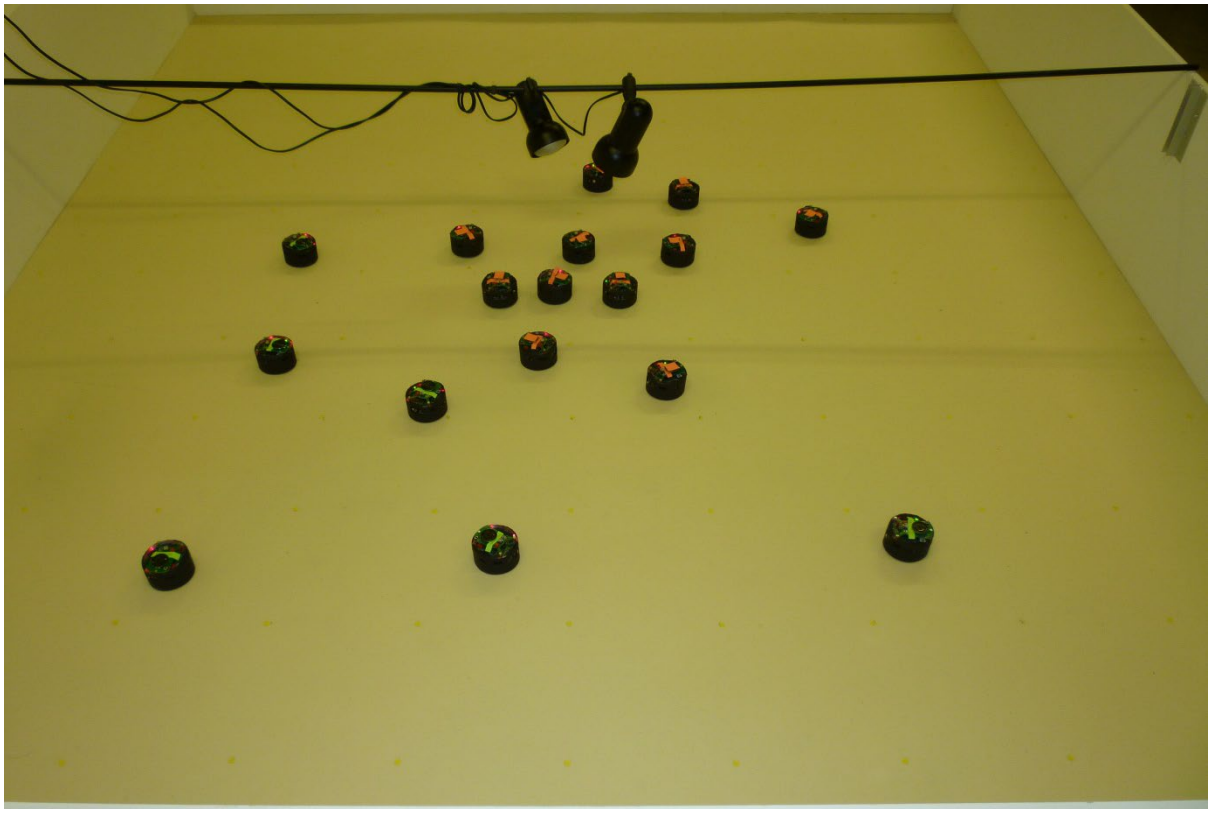
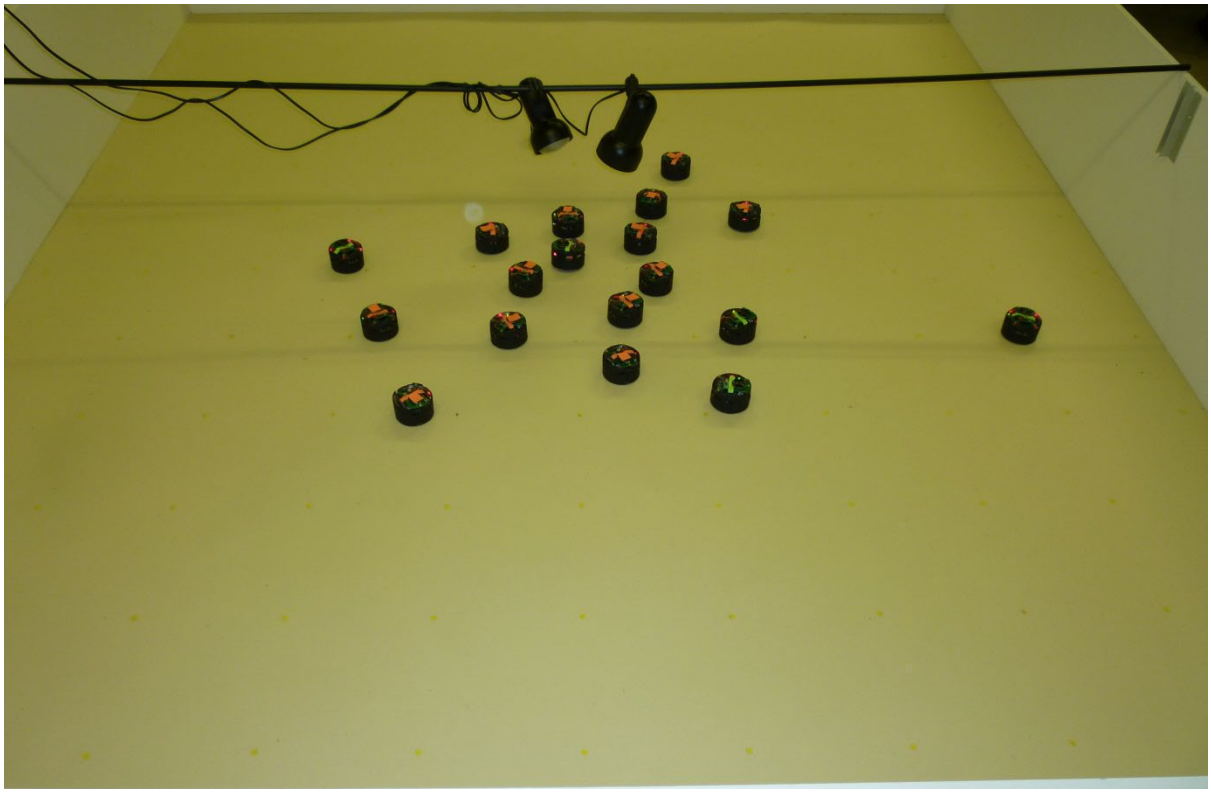


**Figure 0.XIV: Experiment 4 Final Segregation Patterns (A-E)**









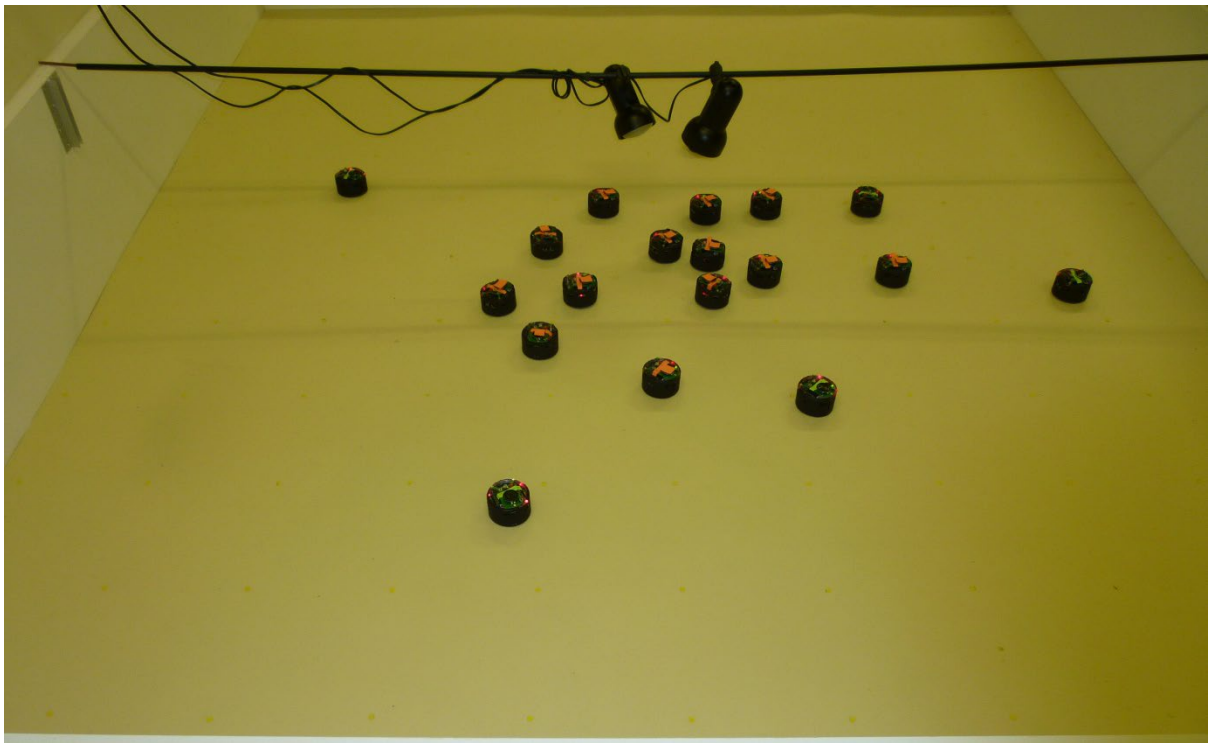
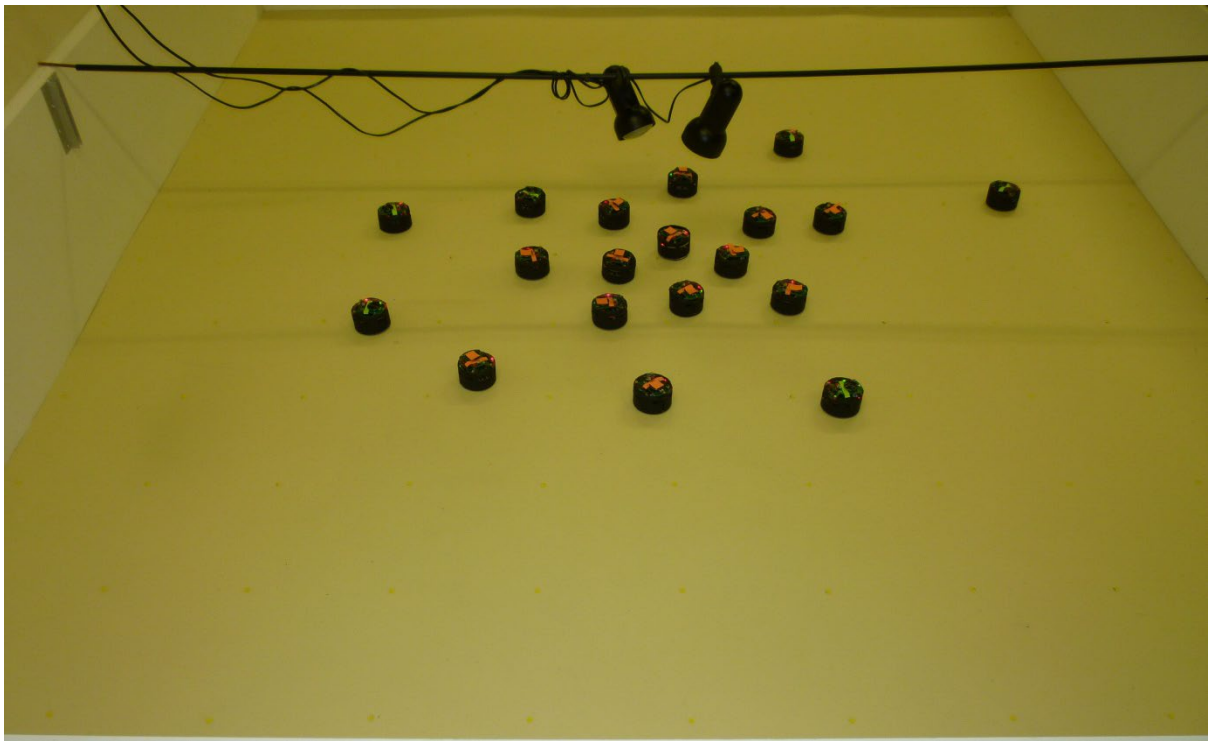
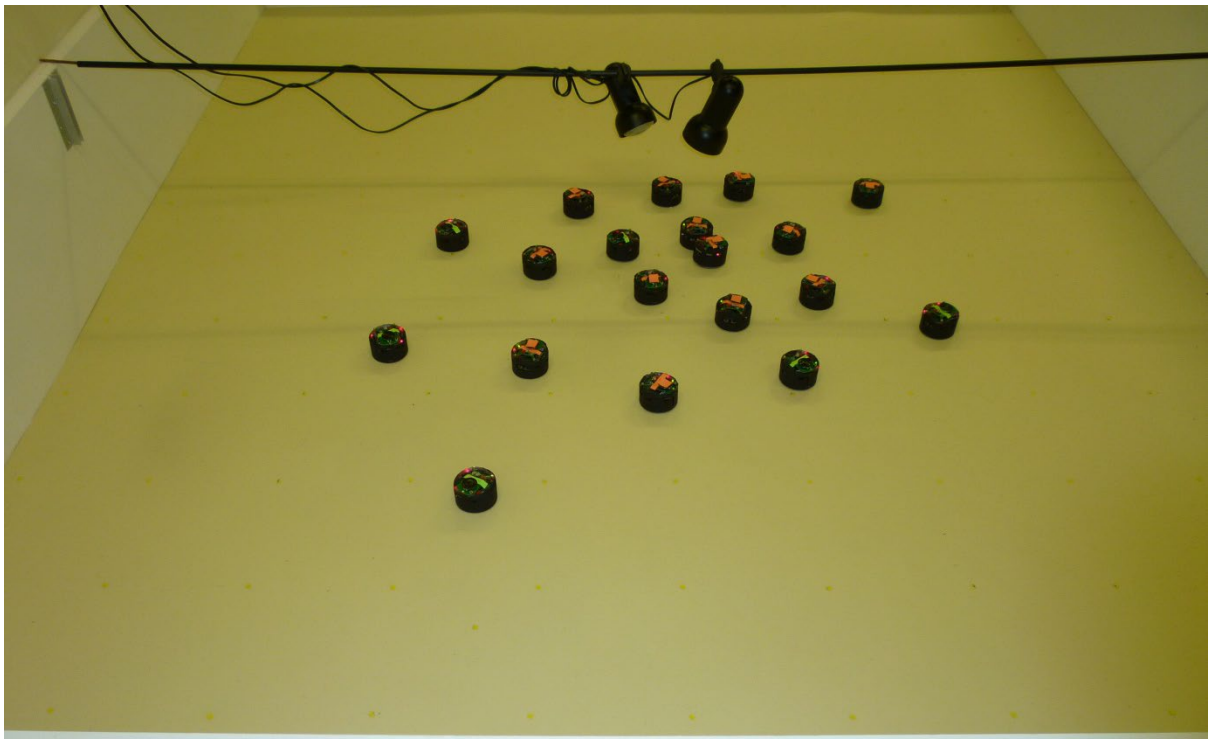
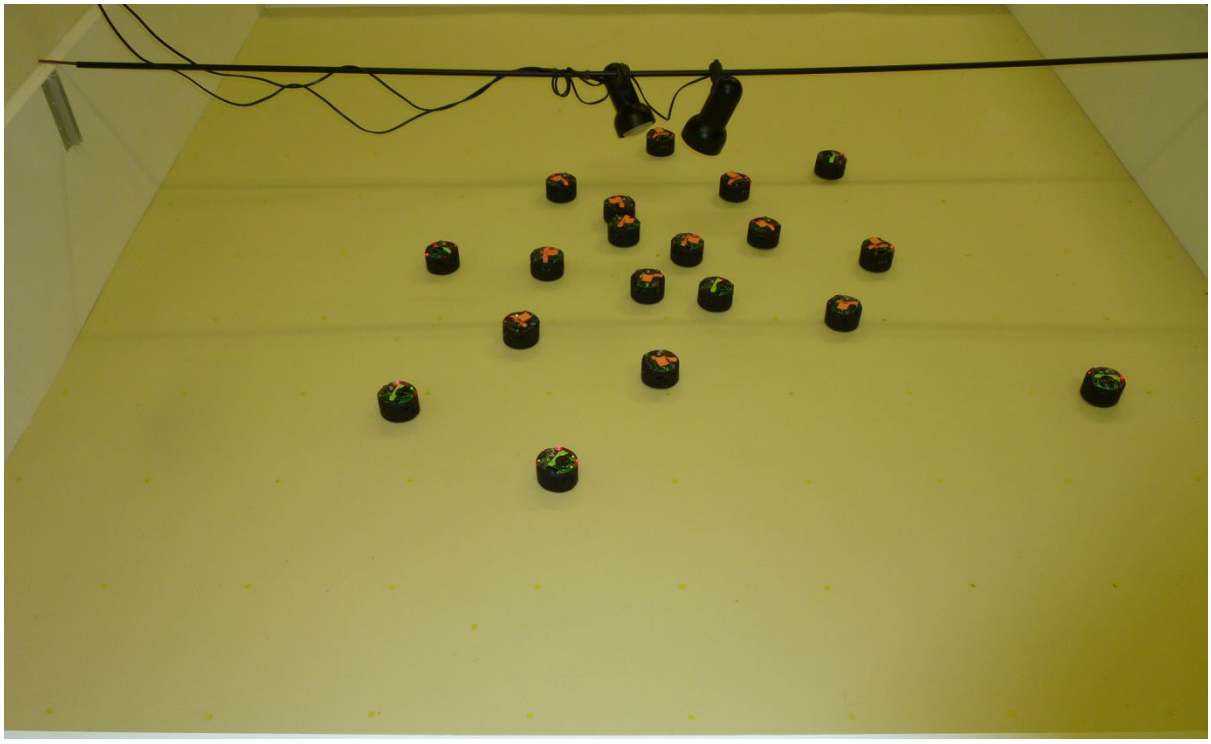
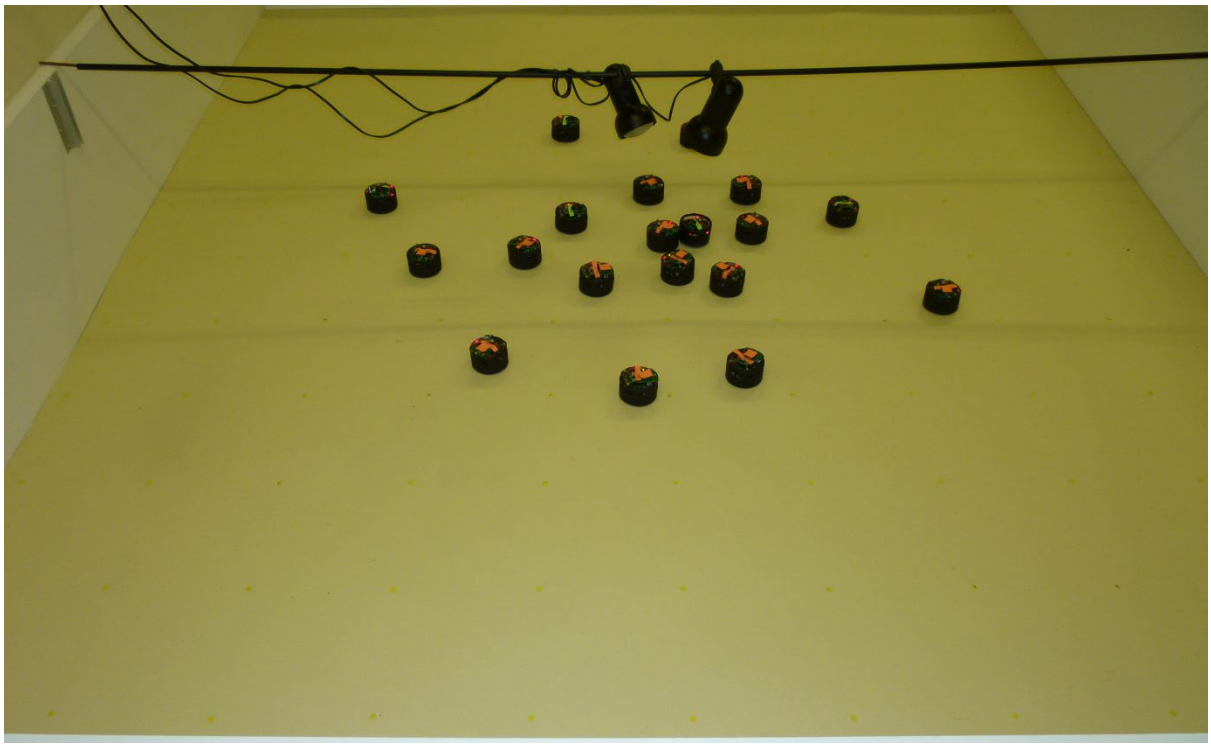


**Figure 0.XV: Experiment 5 Final Segregation Patterns (A-E)**









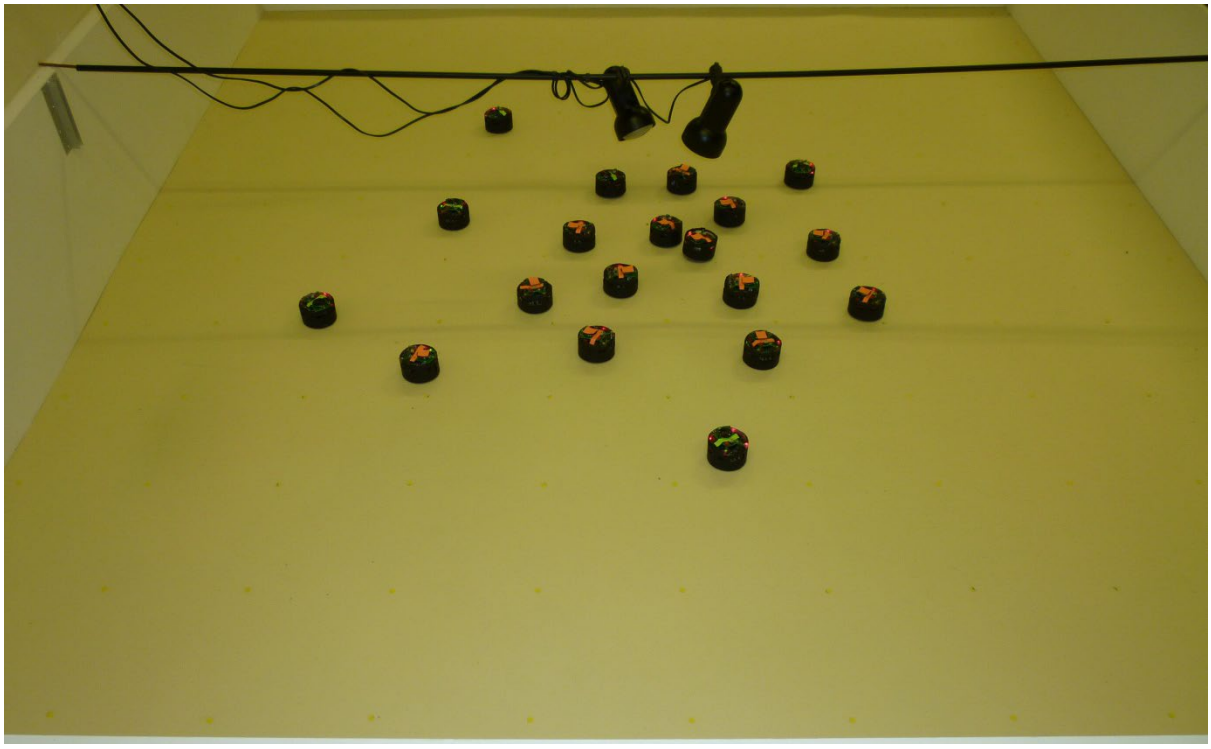
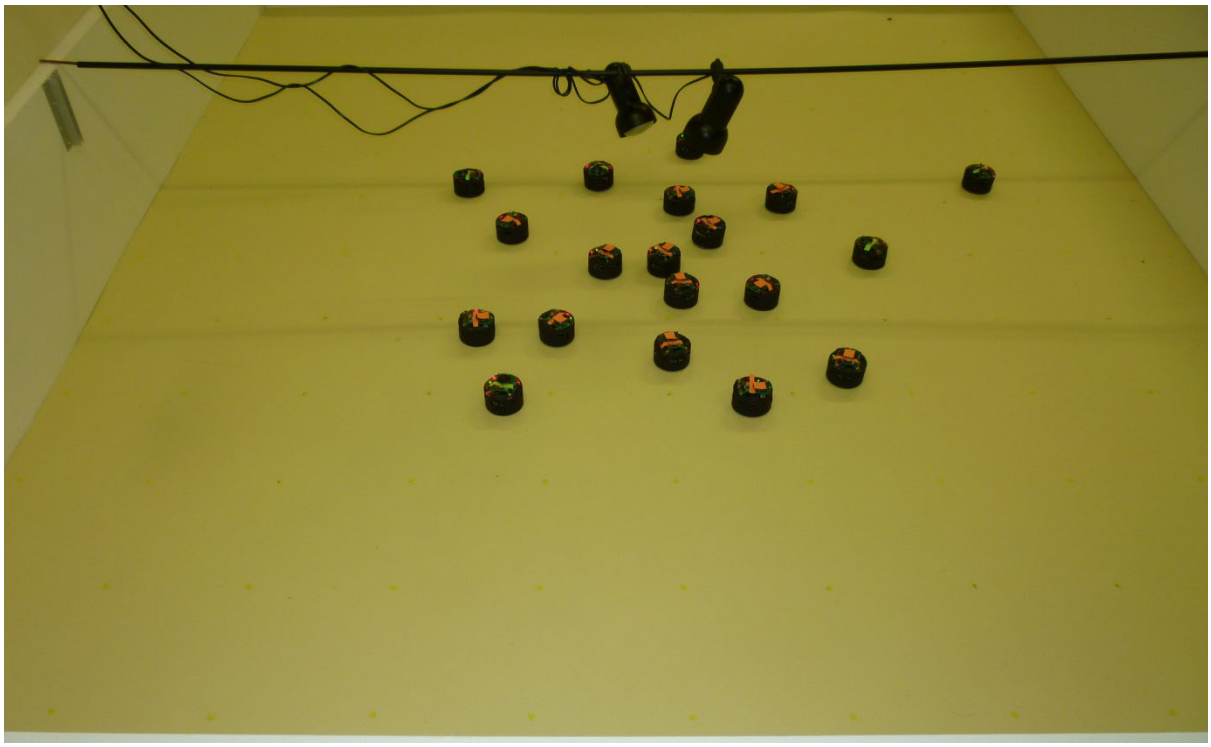
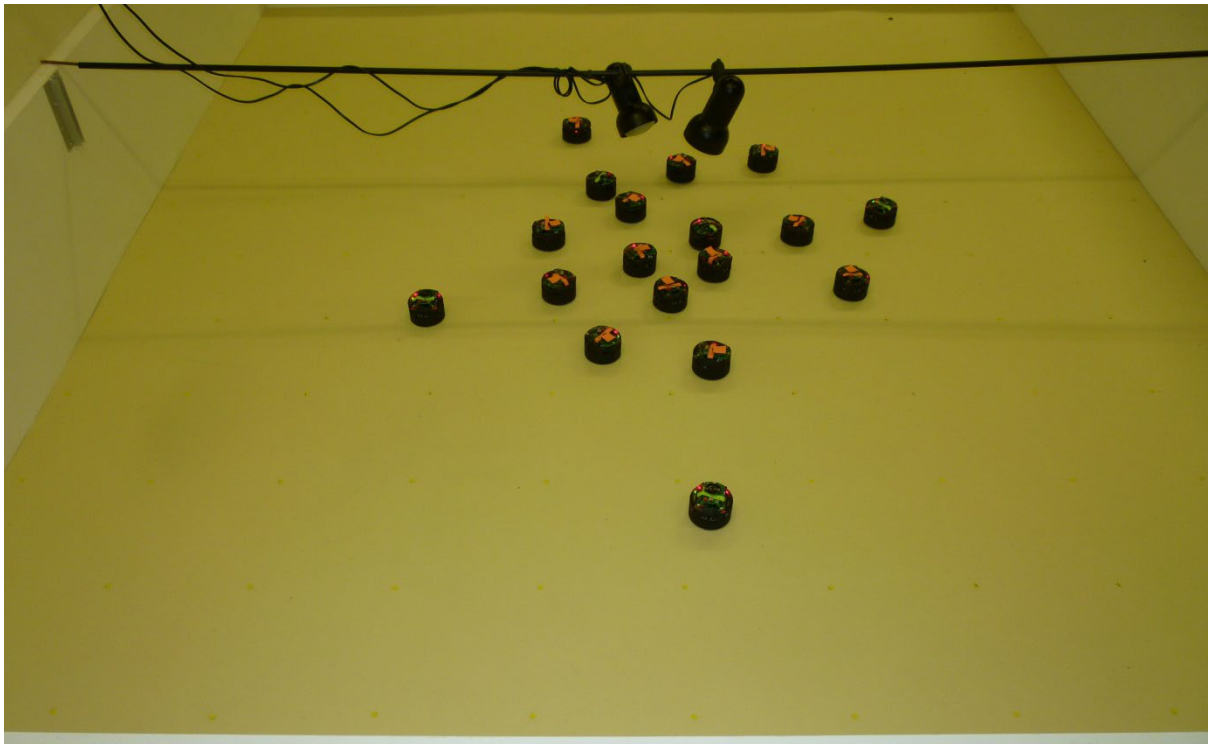
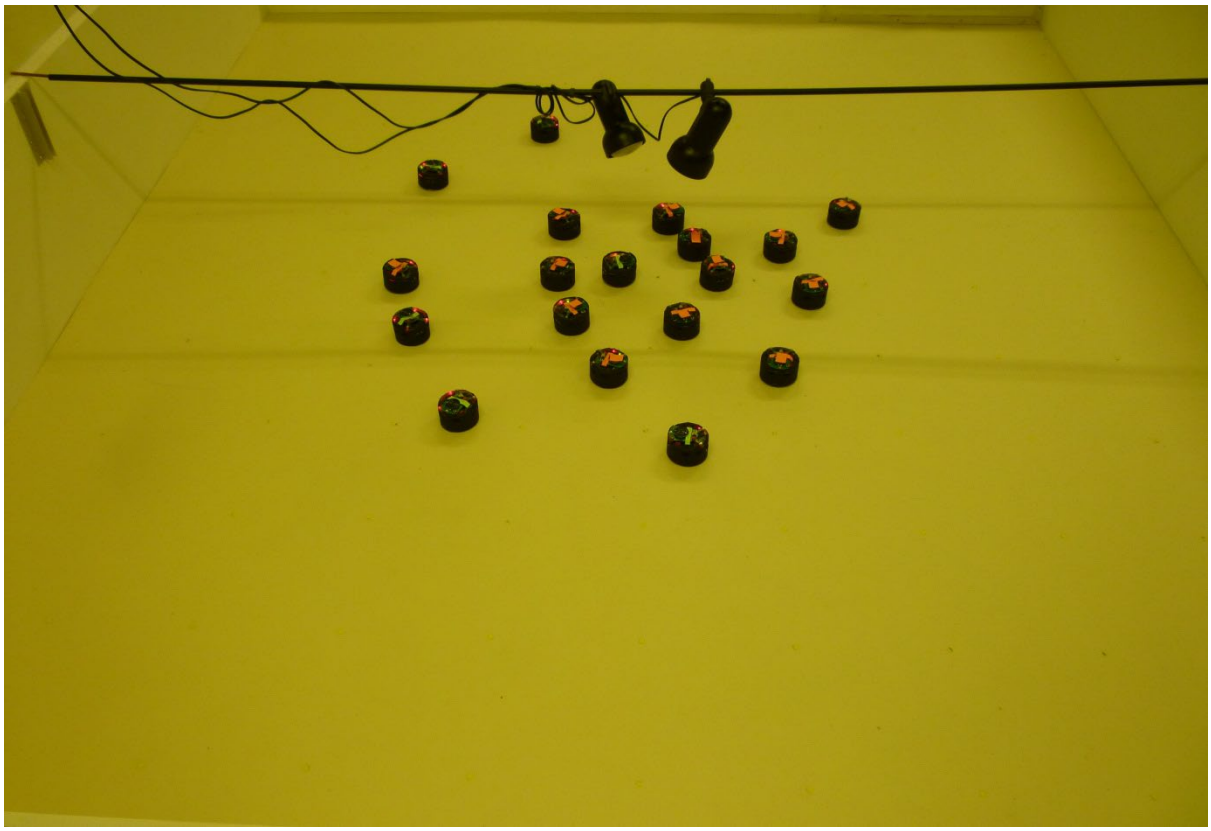
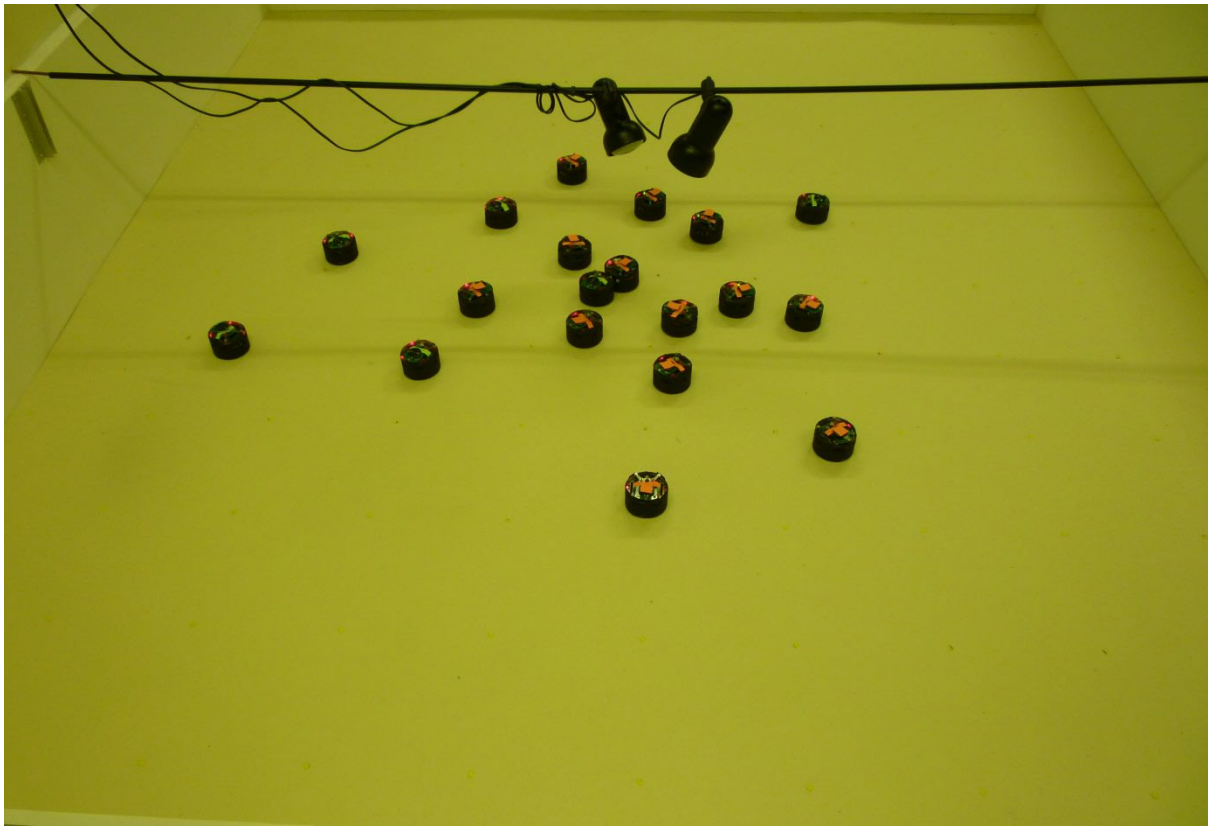


**Figure 0.XVI: Experiment 6 Final Segregation Patterns (A-E)**









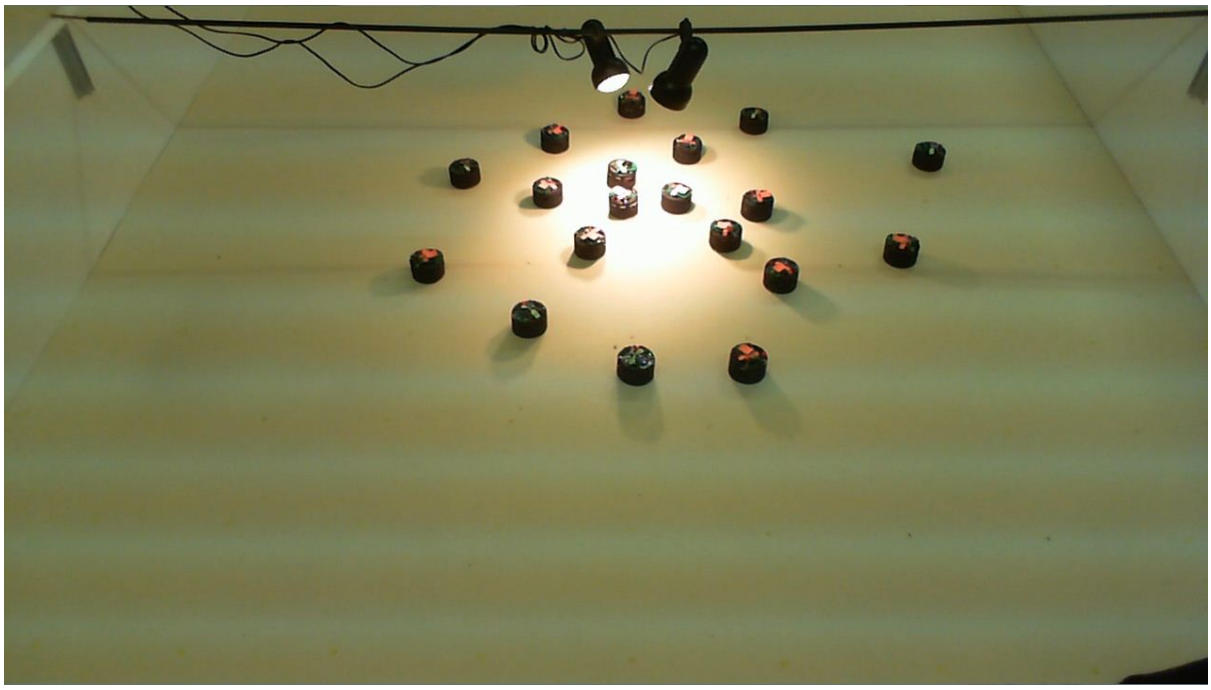
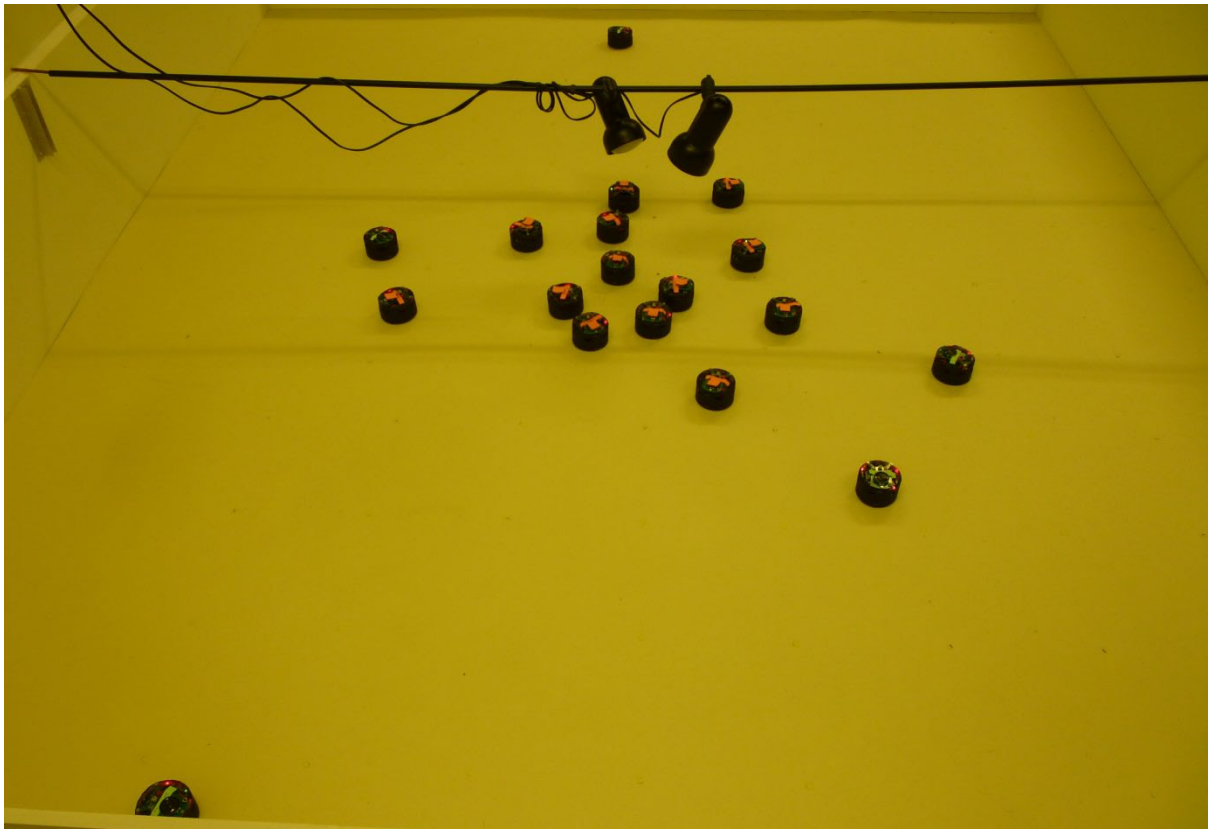
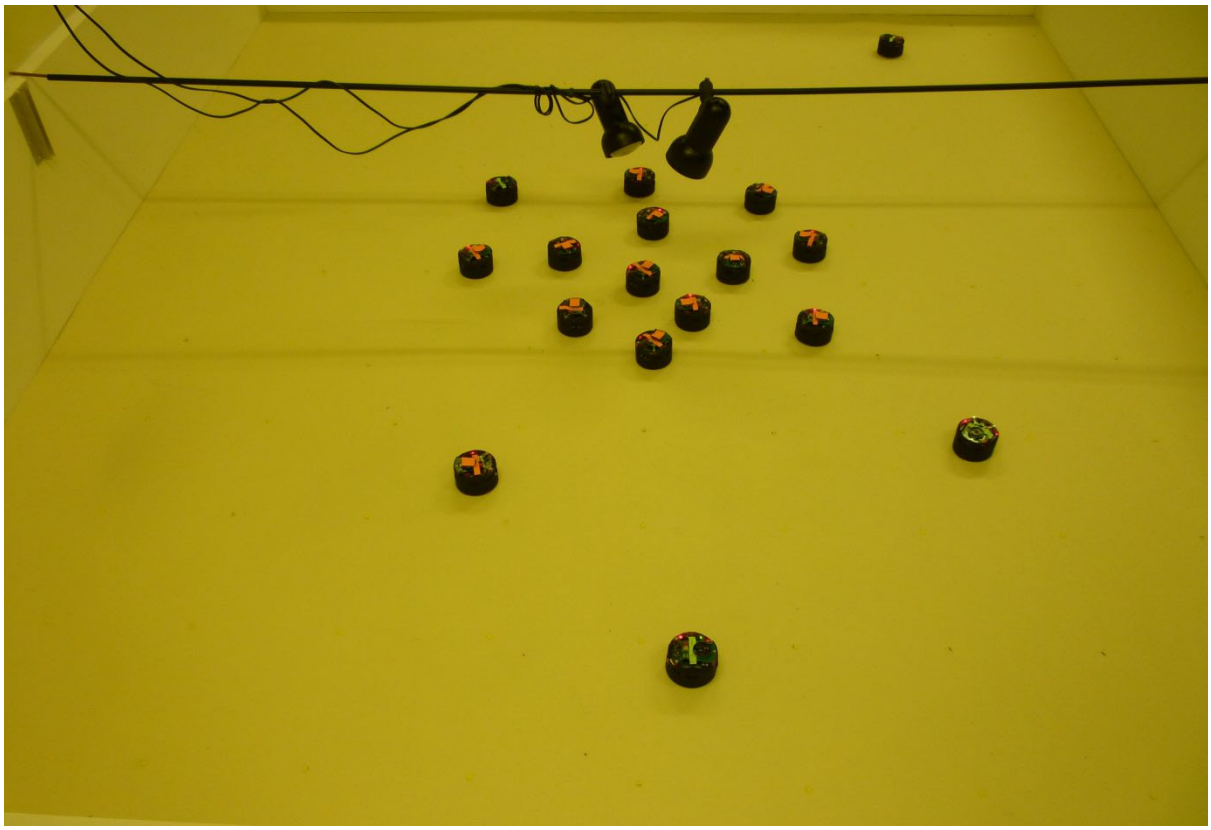
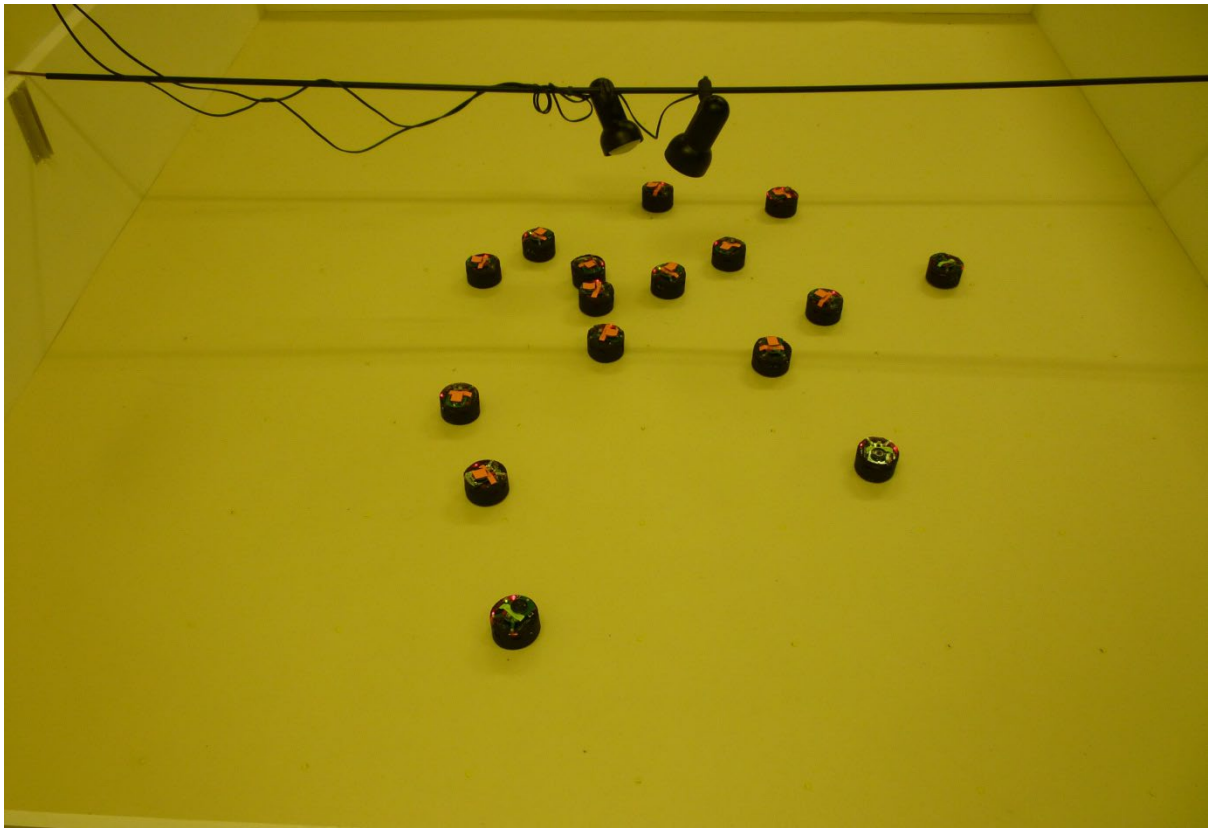


**Figure 0.XVII: Experiment 7 Final Segregation Patterns (A-E)**







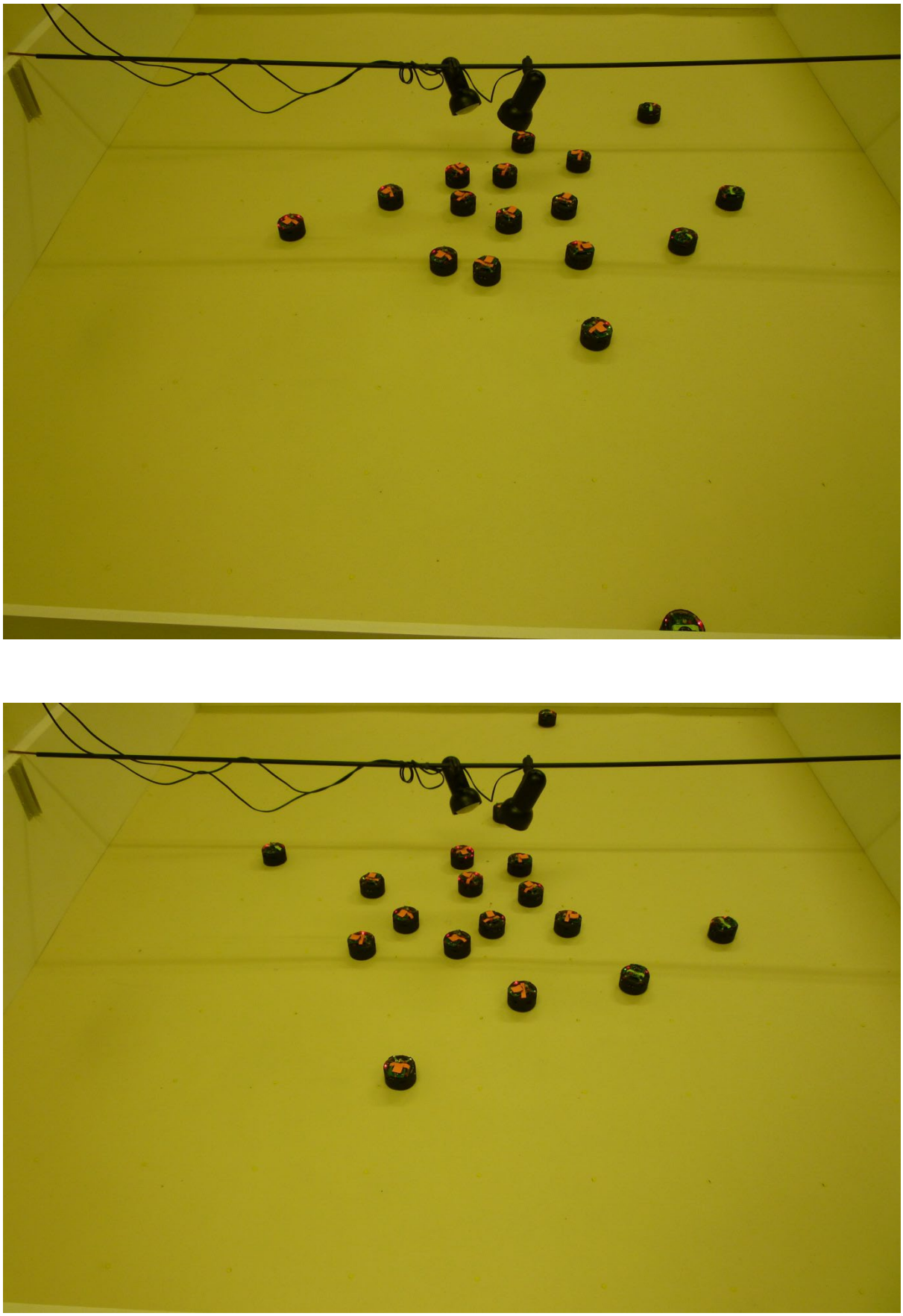
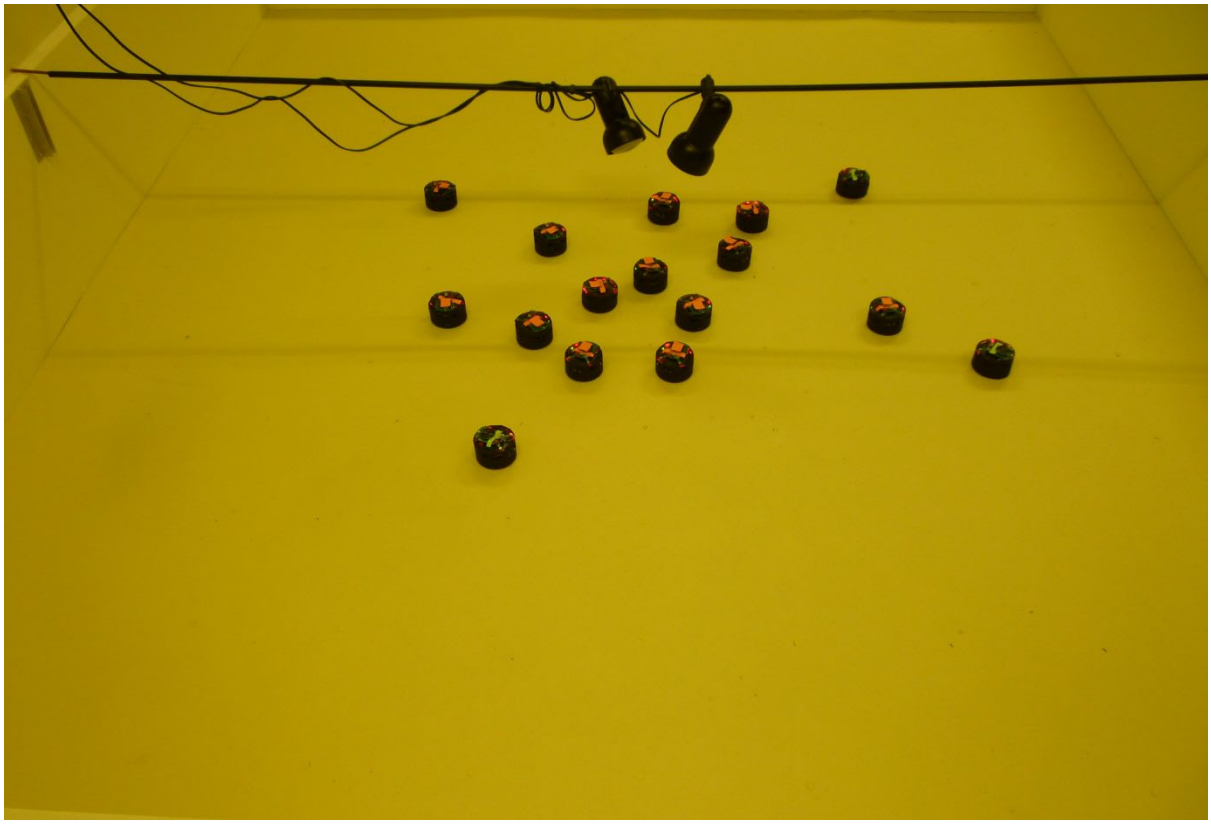
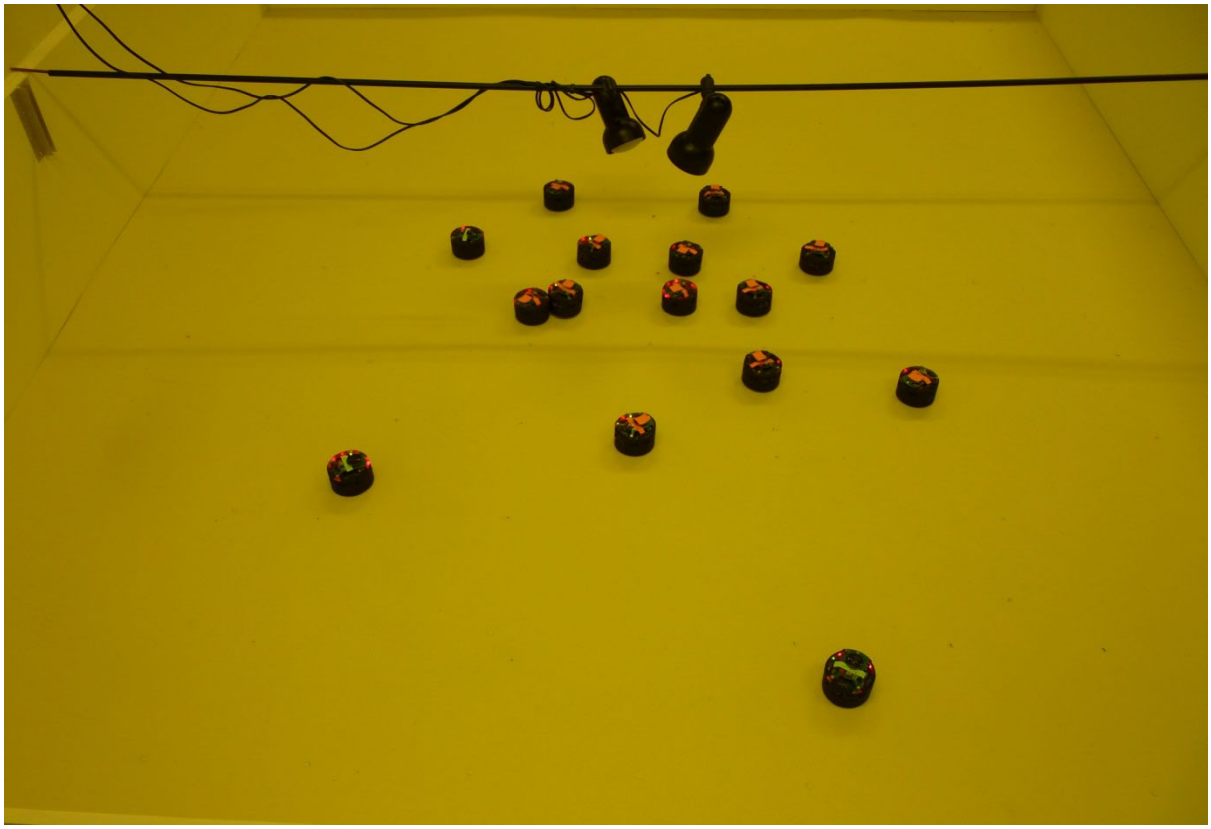
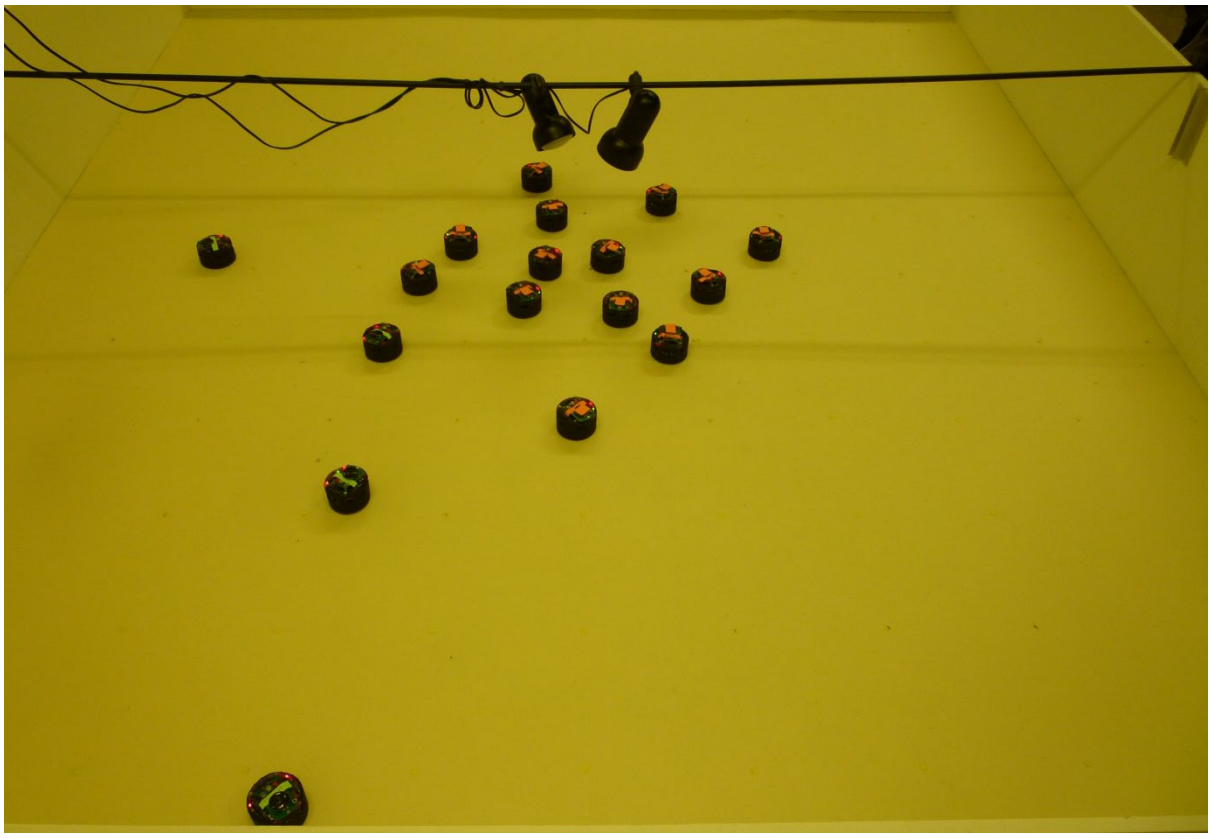
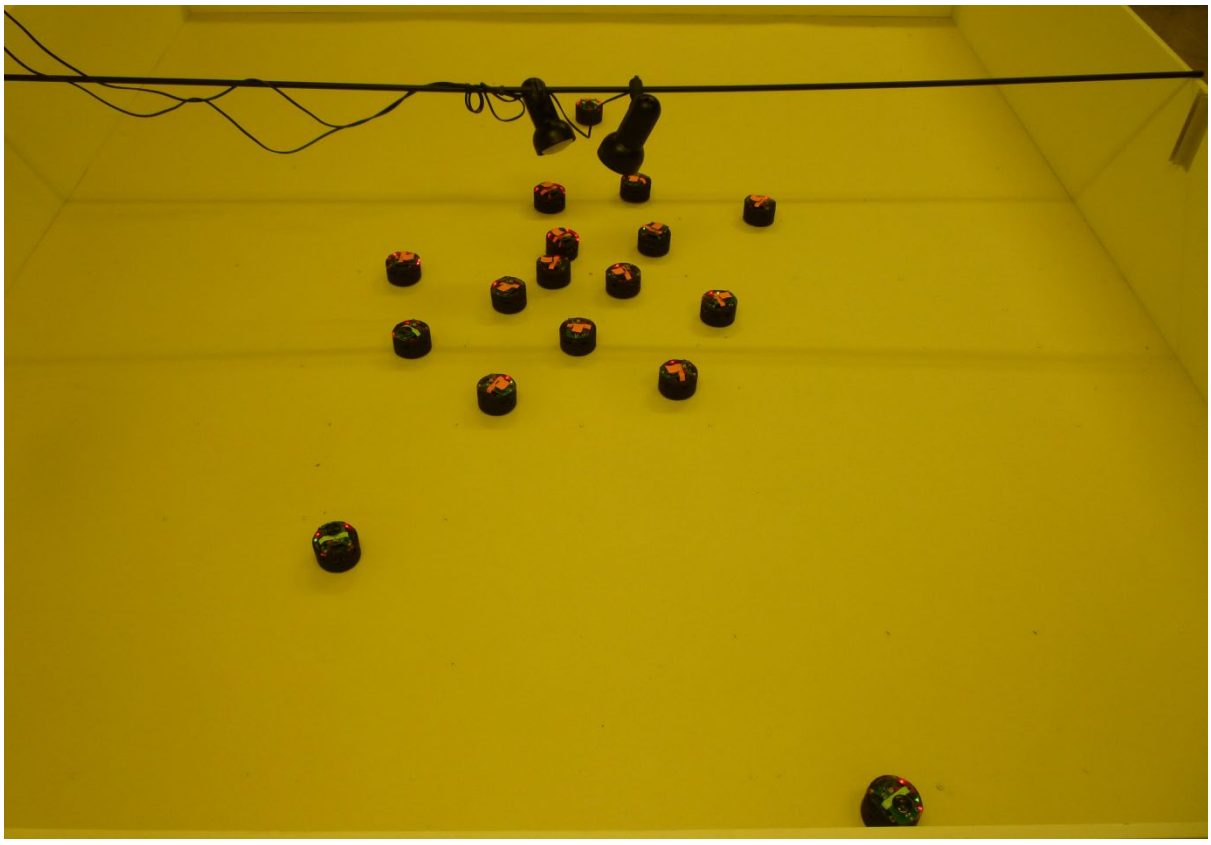


**Figure 0.XVIII: Experiment 8 Final Segregation Patterns (A-E)**









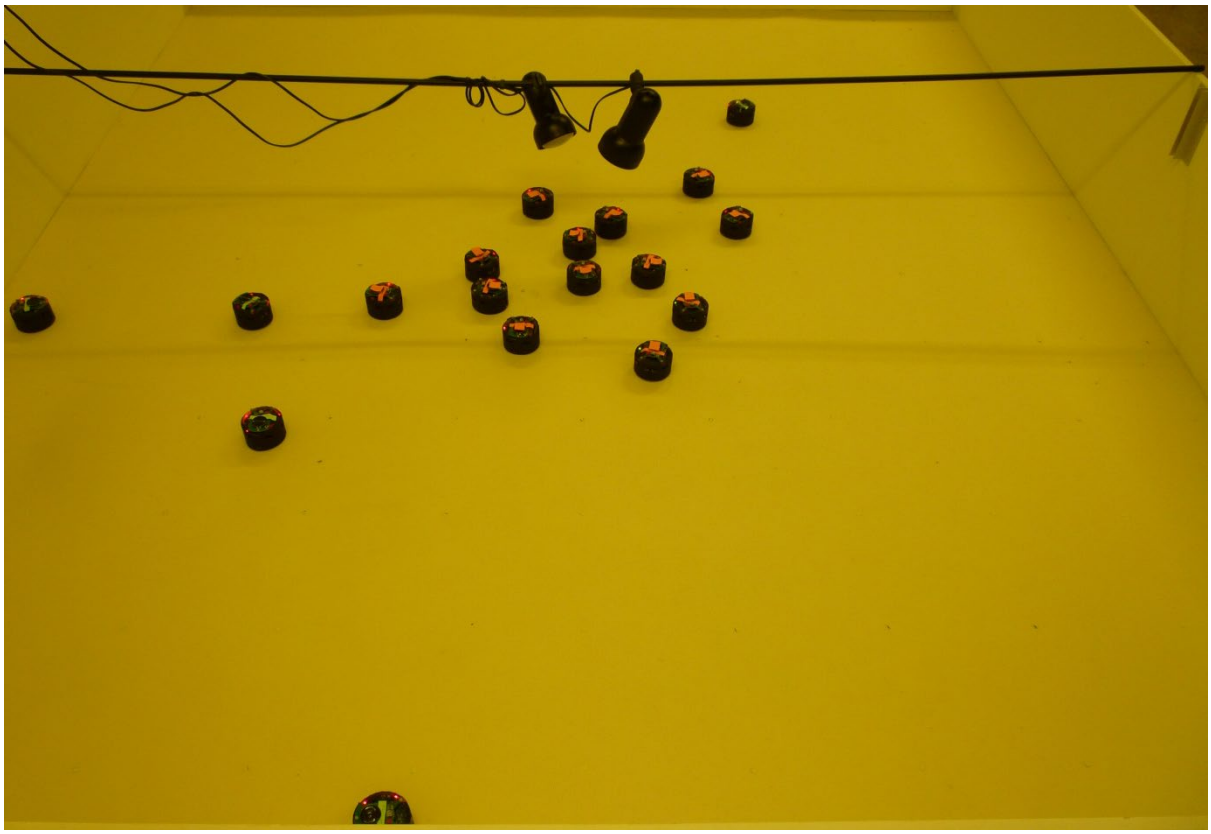
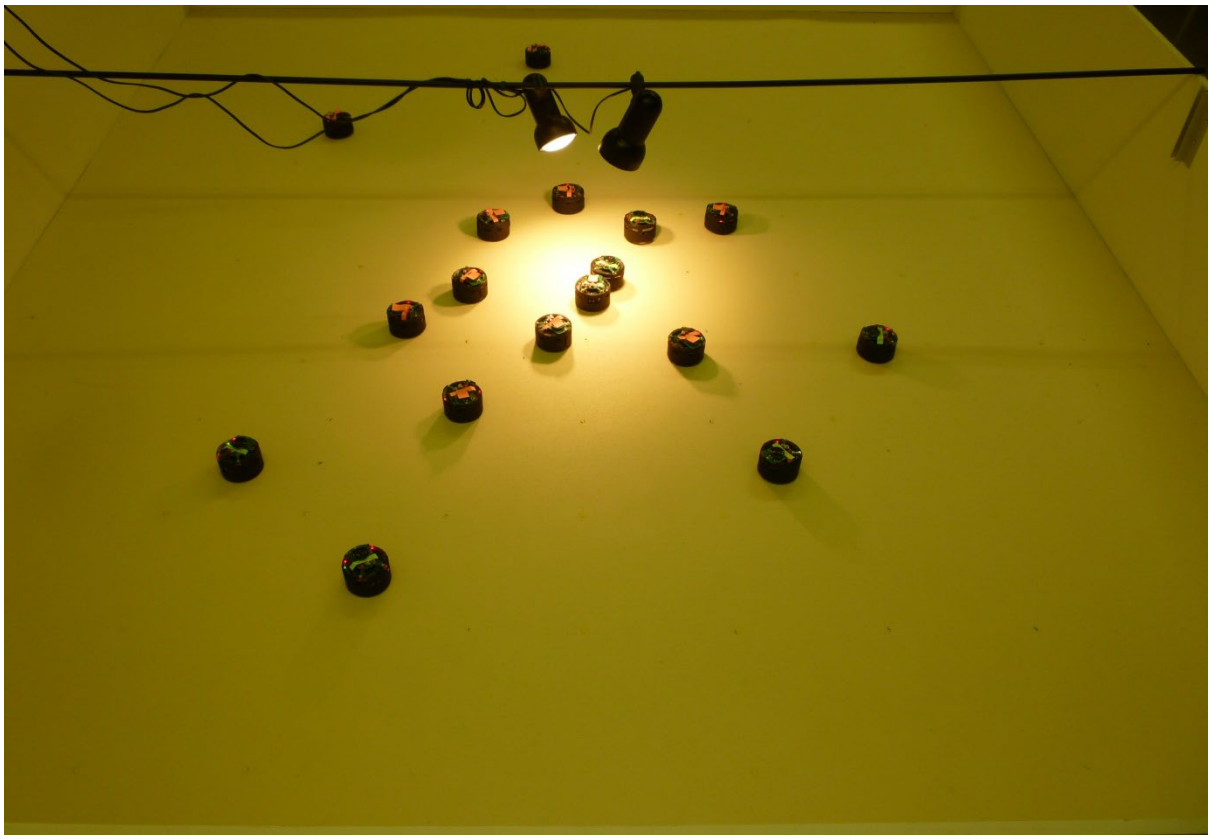
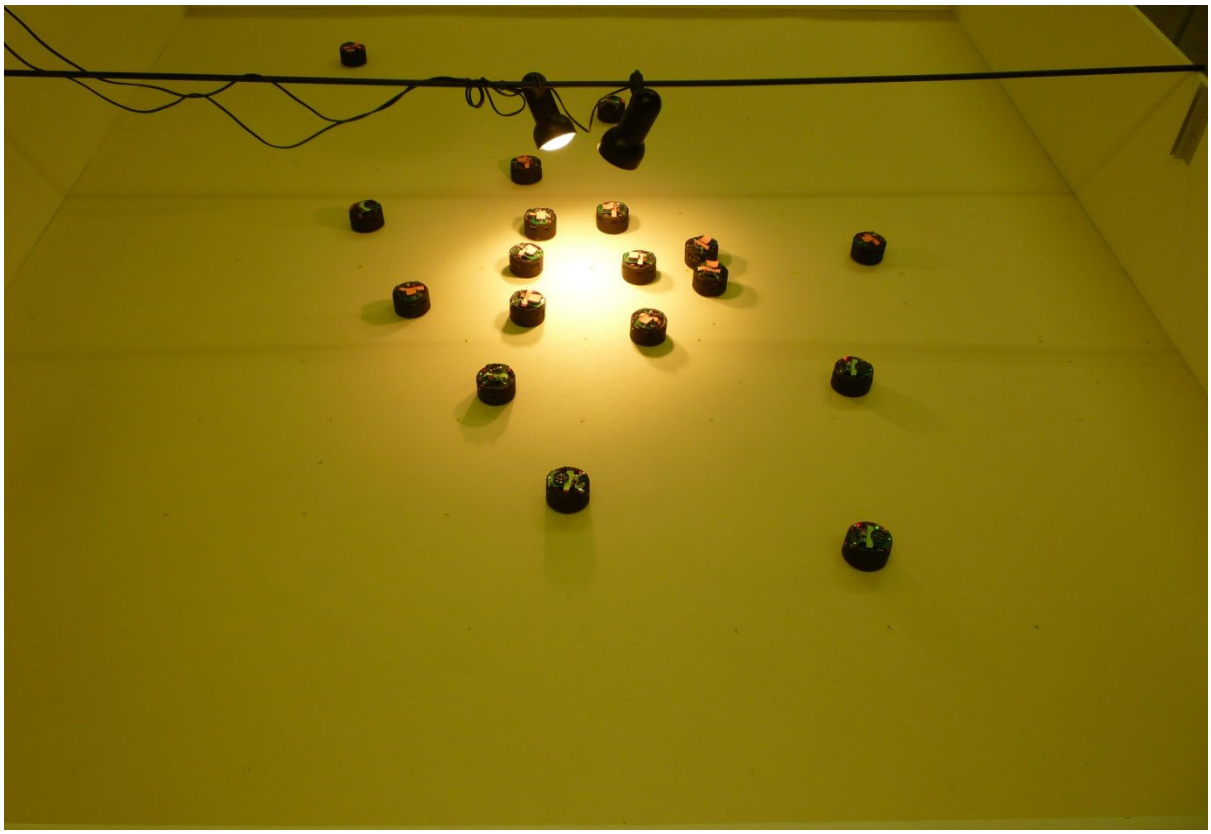
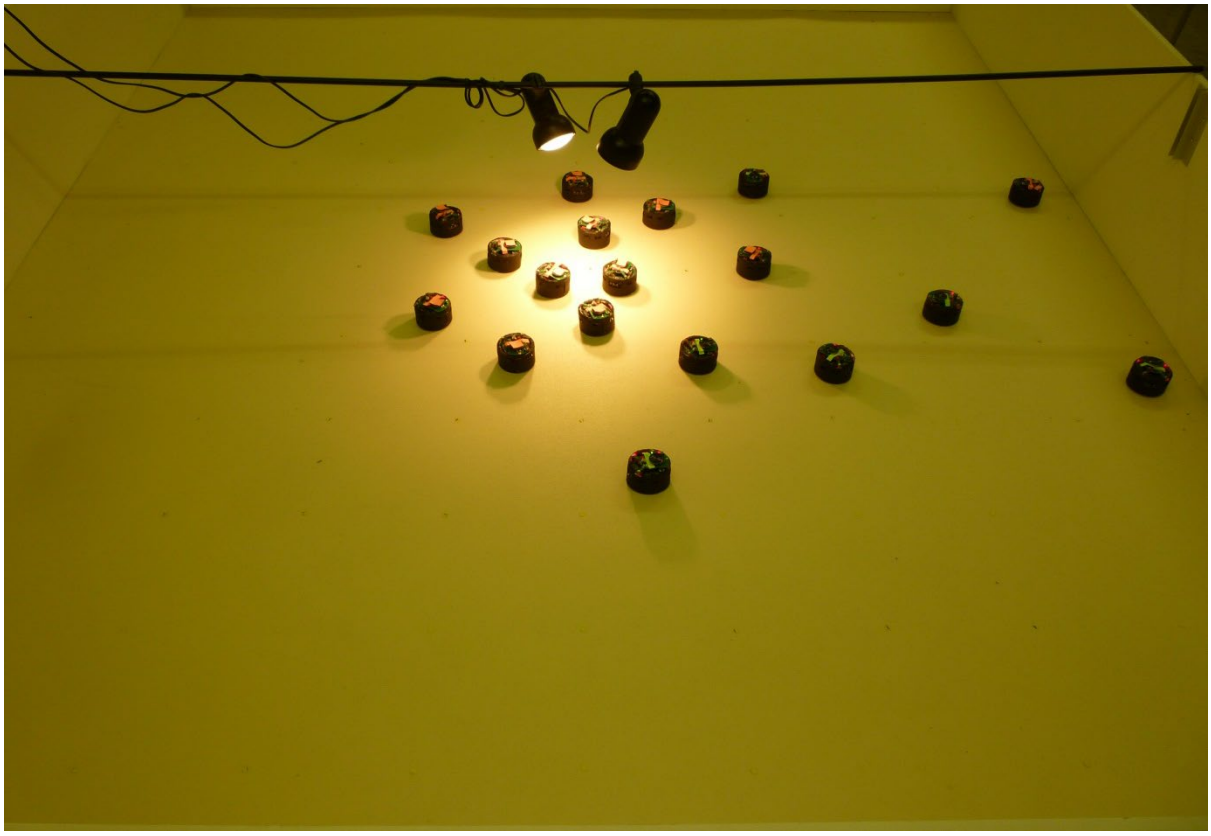
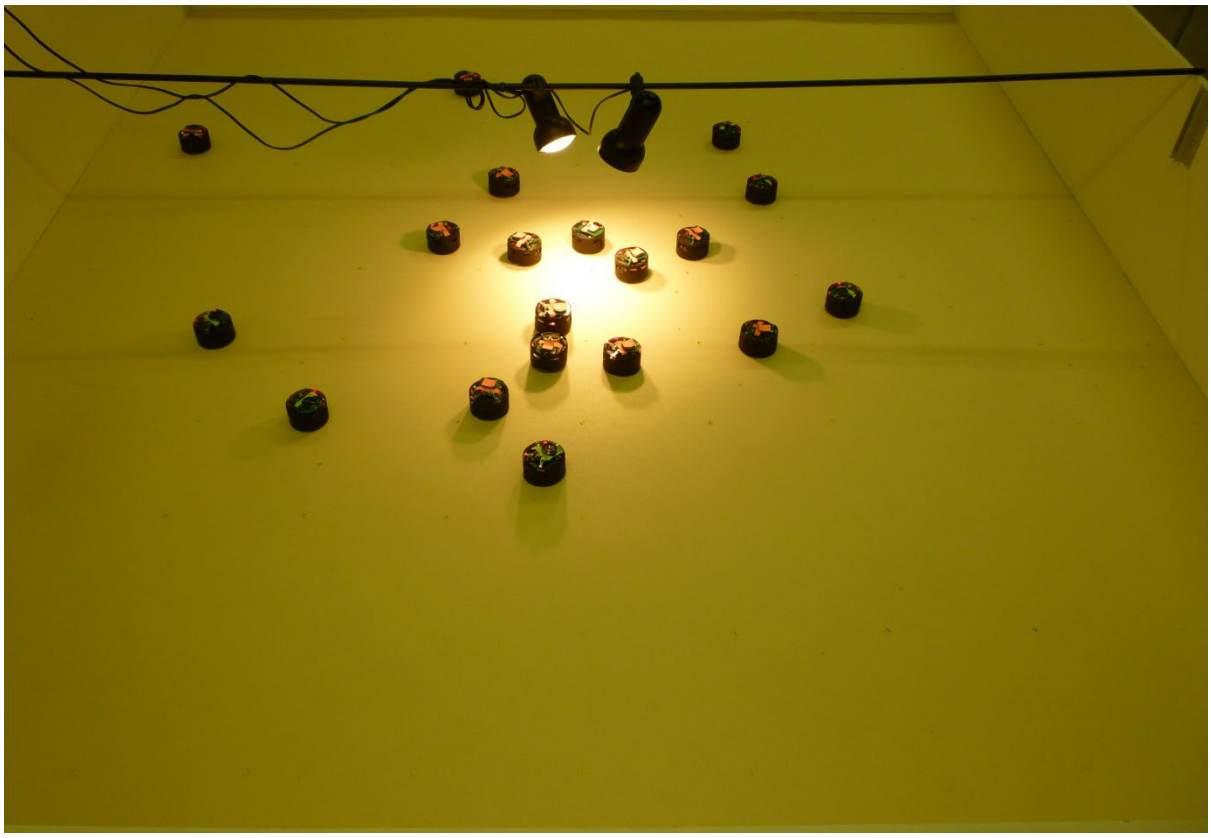


**Figure 0.XIX: Experiment 9 Final Segregation Patterns (A-E)**









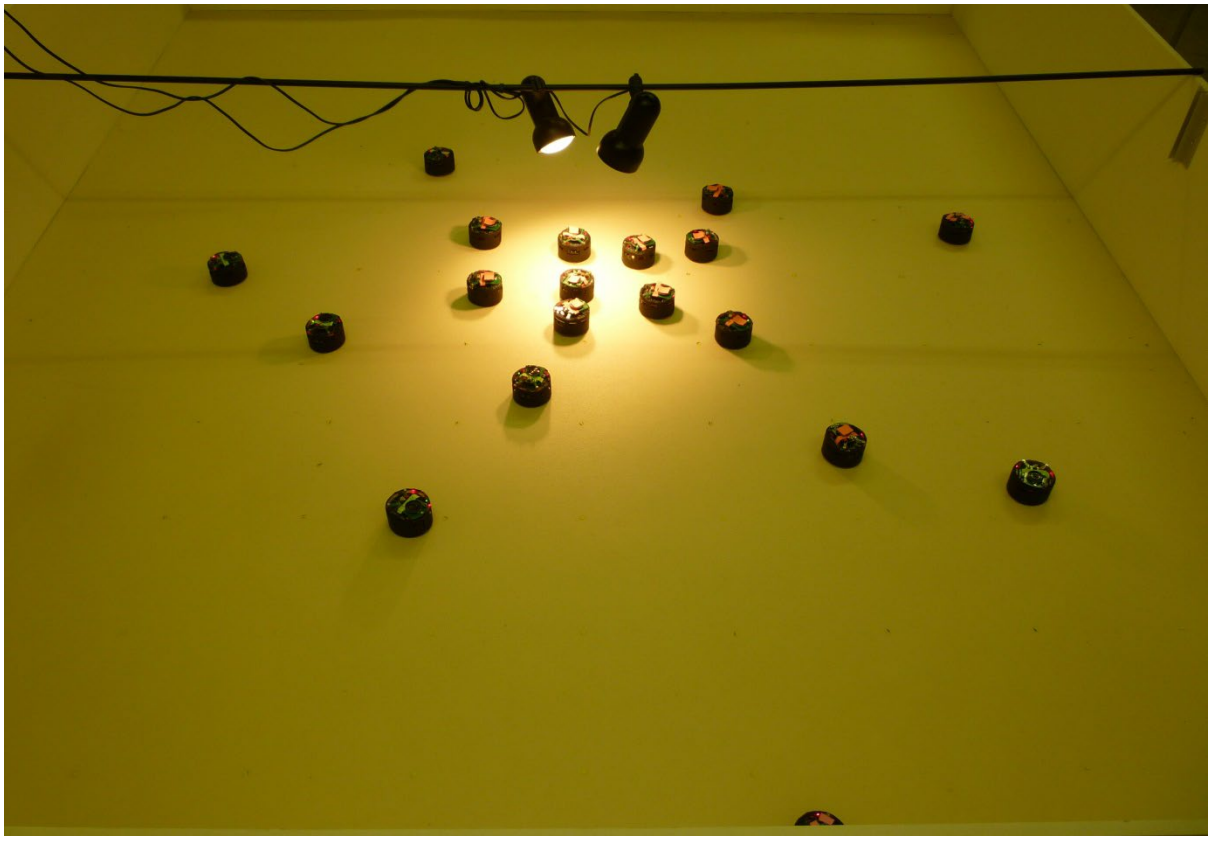
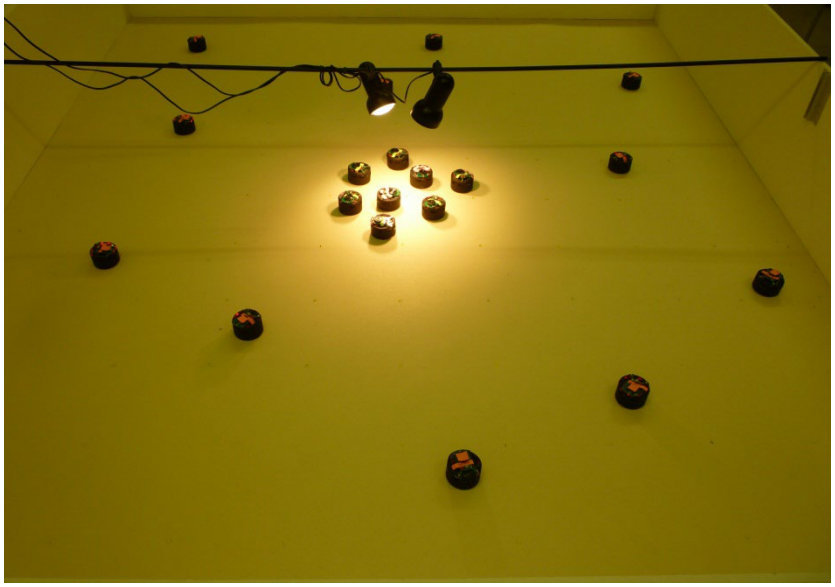


**Figure 0.XX: Experiment 10 Final Segregation Patterns (A-E)**

## 1.3 EXPERIMENT 11 – THE INVERSE-BRAZIL NUT EFFECT

The eleventh experiment produced similar results to the runs in the tenth experiment as expected, but the results are shown separately as the starting position has not been generated in the same pseudo-random manner:



This inverse-Brazil nut setup has two 'large' particles in the very centre, immediately surrounded by six 'medium' particles and with the eleven 'small' particles set nearer to the edge of the arena.

It represents the most challenging situation from which the segregation behaviour can develop as the segregation error beings at roughly 100%.

**Figure 0.XXI: Experiment 11A Starting Positions**

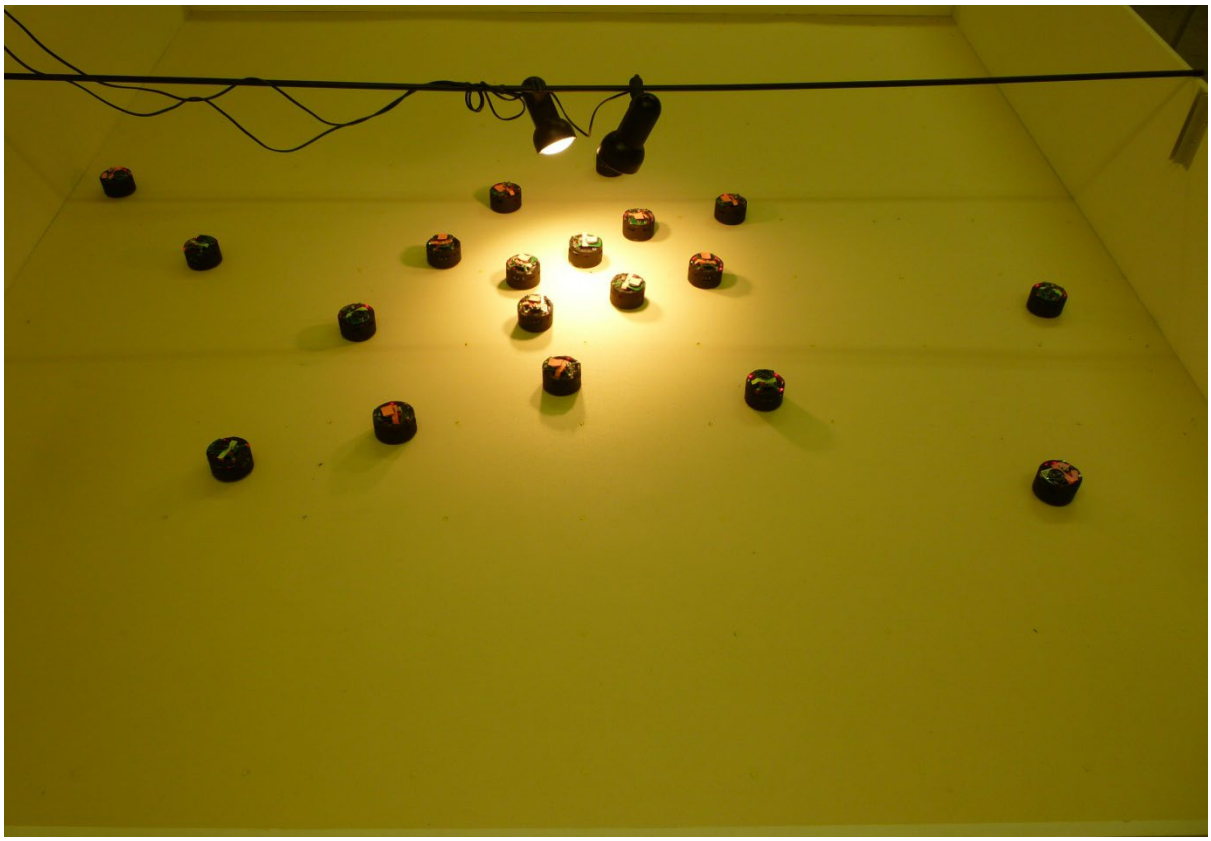


**Figure 0.XXII: Experiment 11A Final Segregation Pattern**

## 1.4 FINAL ROBOT POSITION DATA

The final position data for the experiments summarised in **Figure x** is given below:

| Experiment | 1A | | 1B | | 1C | | 1D | | 1E | |
|---|---|---|---|---|---|---|---|---|---|---|
| Group | S (0.20m) | M (0.45m) | S (0.20m) | M (0.45m) | S (0.20m) | M (0.45m) | S (0.20m) | M (0.45m) | S (0.20m) | M (0.45m) |
| Distance /m | 0.05 | 0.46 | 0.13 | 0.77 | 0.02 | 0.47 | 0.01 | 0.25 | 0.04 | 0.74 |
| | 0.09 | 0.68 | 0.18 | 0.84 | 0.14 | 0.56 | 0.14 | 0.33 | 0.13 | 0.84 |
| | 0.19 | 0.83 | 0.19 | 0.86 | 0.21 | 0.61 | 0.14 | 0.81 | 0.16 | 0.87 |
| | 0.20 | 1.07 | 0.25 | 0.87 | 0.21 | 0.94 | 0.20 | 1.23 | 0.18 | 1.28 |
| | 0.24 | 1.13 | 0.27 | 1.38 | 0.25 | 1.41 | 0.26 | 1.29 | 0.26 | 1.49 |
| | 0.25 | 1.30 | 0.31 | Wheel (0.05) | 0.28 | 1.61 | 0.34 | 1.58 | 0.34 | Wheel (0.35) |
| | 0.33 | | 0.40 | | 0.31 | | 0.39 | | 0.35 | |
| | 0.34 | | 0.42 | | Wheel (0.74) | | 0.52 | | 0.46 | |
| Minimum | 0.05 | 0.46 | 0.13 | 0.77 | 0.02 | 0.47 | 0.01 | 0.25 | 0.04 | 0.74 |
| Maximum | 0.34 | 1.30 | 0.42 | 1.38 | 0.31 | 1.61 | 0.52 | 1.58 | 0.46 | 1.49 |
| Average | 0.21 | 0.91 | 0.27 | 0.94 | 0.20 | 0.93 | 0.25 | 0.92 | 0.24 | 1.04 |
| Overlap | No | | No | | No | | Yes | | No | |
| H/W Errors | 0 | 0 | 1 | 1W | 1W | 0 | 1W | 0 | 0 | 1W |

**Table 0.I: Experiment 1 Final Distances (Size Ratio 2.25)**

| Experiment | 2A | | 2B | | 2C | | 2D | | 2E | |
|---|---|---|---|---|---|---|---|---|---|---|
| Group | S (0.20m) | M (0.20m) | S (0.20m) | M (0.20m) | S (0.30m) | M (0.30m) | S (0.30m) | M (0.30m) | S (0.20m) | M (0.20m) |
| Distance /m | 0.12 | 0.15 | 0.11 | 0.10 | 0.10 | 0.40 | 0.10 | 0.34 | 0.05 | 0.14 |
| | 0.16 | 0.17 | 0.23 | 0.14 | 0.17 | 0.47 | 0.11 | 0.43 | 0.10 | 0.20 |
| | 0.24 | 0.18 | 0.36 | 0.19 | 0.28 | 0.48 | 0.37 | 0.59 | 0.19 | 0.36 |
| | 0.30 | 0.37 | 0.38 | 0.21 | 0.29 | 0.54 | 0.38 | 0.60 | 0.26 | 0.45 |
| | 0.34 | 0.38 | 0.38 | 0.37 | 0.44 | 0.74 | 0.48 | 0.70 | 0.26 | 0.55 |
| | 0.47 | 0.49 | 0.43 | 0.37 | 0.57 | 0.82 | 0.65 | 0.87 | 0.29 | 0.78 |
| | 0.51 | | 0.47 | | 0.82 | | 0.89 | | 0.33 | |
| | 0.62 | | Stuck (0.70) | | 0.84 | | 0.94 | | 0.44 | |
| Minimum | 0.12 | 0.15 | 0.11 | 0.10 | 0.10 | 0.40 | 0.10 | 0.34 | 0.05 | 0.14 |
| Maximum | 0.62 | 0.49 | 0.47 | 0.37 | 0.84 | 0.82 | 0.94 | 0.87 | 0.44 | 0.78 |
| Average | 0.35 | 0.29 | 0.34 | 0.23 | 0.44 | 0.58 | 0.49 | 0.59 | 0.24 | 0.41 |
| Overlap | Yes | | Yes | | Yes | | Yes | | Yes | |
| H/W Errors | 0 | 1W | 1St | 0 | 0 | 0 | 1 | 0 | 0 | 1 |

**Table 0.II: Experiment 2 Final Distances (Size Ratio 1.00)**

| Experiment | 3A | | 3B | | 3C | | 3D | | 3E | |
|---|---|---|---|---|---|---|---|---|---|---|
| Group | S (0.20m) | M (0.40m) | S (0.20m) | M (0.40m) | S (0.20m) | M (0.40m) | S (0.20m) | M (0.40m) | S (0.20m) | M (0.40m) |
| Distance /m | 0.05 | 0.44 | 0.04 | 0.36 | 0.07 | 0.66 | 0.09 | 0.65 | 0.07 | 0.23 |
| | 0.17 | 0.65 | 0.08 | 0.70 | 0.16 | 0.74 | 0.11 | 0.82 | 0.09 | 0.84 |
| | 0.20 | 0.71 | 0.17 | 0.80 | 0.16 | 0.83 | 0.15 | 0.82 | 0.11 | 0.95 |
| | 0.22 | 0.77 | 0.19 | 0.83 | 0.18 | 0.90 | 0.22 | 0.89 | 0.22 | 1.23 |
| | 0.25 | 1.22 | 0.23 | 0.89 | 0.19 | 1.01 | 0.24 | 1.28 | 0.23 | 1.32 |
| | 0.26 | 1.34 | 0.28 | 1.11 | 0.28 | 1.04 | 0.24 | 1.62 | 0.31 | 1.40 |
| | 0.36 | | 0.38 | | 0.42 | | 0.36 | | 0.41 | |
| | 0.52 | | 0.38 | | 0.50 | | 0.41 | | Reset | |
| Minimum | 0.05 | 0.44 | 0.04 | 0.36 | 0.07 | 0.66 | 0.09 | 0.65 | 0.07 | 0.23 |
| Maximum | 0.52 | 1.34 | 0.38 | 1.11 | 0.50 | 1.04 | 0.41 | 1.62 | 0.41 | 1.40 |
| Average | 0.25 | 0.86 | 0.22 | 0.78 | 0.25 | 0.86 | 0.23 | 1.01 | 0.21 | 1.00 |
| Overlap | Yes | | Yes | | No | | No | | Yes | |
| H/W Errors | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1W | 2R, 2S | 1R |

**Table 0.III: Experiment 3 Final Distances (Size Ratio 2.00)**

| Experiment | 4A | | 4B | | 4C | | 4D | | 4E | |
|---|---|---|---|---|---|---|---|---|---|---|
| Group | S (0.20m) | M (0.36m) | S (0.20m) | M (0.36m) | S (0.20m) | M (0.36m) | S (0.20m) | M (0.36m) | S (0.20m) | M (0.36m) |
| Distance /m | 0.14 | 0.51 | 0.07 | 0.41 | 0.07 | 0.38 | 0.04 | 0.58 | 0.06 | 0.49 |
| | 0.10 | 0.63 | 0.16 | 0.72 | 0.11 | 0.51 | 0.14 | 0.60 | 0.17 | 0.71 |
| | 0.11 | 0.66 | 0.18 | 0.72 | 0.17 | 0.68 | 0.15 | 0.63 | 0.19 | 0.71 |
| | 0.15 | 0.92 | 0.23 | 0.74 | 0.21 | 0.75 | 0.17 | 0.87 | 0.21 | 0.74 |
| | 0.16 | 0.92 | 0.28 | 0.89 | 0.33 | 0.80 | 0.27 | 1.28 | 0.26 | 0.82 |
| | 0.29 | Reset | 0.39 | 0.92 | 0.59 | 1.18 | 0.31 | Battery | 0.27 | 1.48 |
| | 0.33 | | 0.45 | | Battery | | 0.42 | | 0.28 | |
| | 0.47 | | Reset | | Reset | | Battery | | 0.37 | |
| Minimum | 0.10 | 0.51 | 0.07 | 0.41 | 0.07 | 0.38 | 0.04 | 0.58 | 0.06 | 0.49 |
| Maximum | 0.47 | 0.92 | 0.45 | 0.92 | 0.59 | 1.18 | 0.42 | 1.28 | 0.37 | 1.48 |
| Average | 0.22 | 0.73 | 0.25 | 0.73 | 0.25 | 0.72 | 0.21 | 0.79 | 0.23 | 0.83 |
| Overlap | No | | Yes | | Yes | | No | | No | |
| H/W Errors | 1W | 1R | 2R | 0 | 2B, 1R | 0 | 1B | 1B | 0 | 0 |

**Table 0.IV: Experiment 4 Final Distances (Size Ratio 1.80)**

| Experiment | 5A | | 5B | | 5C | | 5D | | 5E | |
|---|---|---|---|---|---|---|---|---|---|---|
| Group | S (0.20m) | M (0.32m) | S (0.20m) | M (0.32m) | S (0.20m) | M (0.32m) | S (0.20m) | M (0.32m) | S (0.20m) | M (0.32m) |
| Distance /m | Stuck (0.15) | 0.35 | 0.04 | 0.56 | 0.06 | 0.47 | 0.15 | 0.41 | 0.01 | 0.54 |
| | 0.07 | 0.61 | 0.12 | 0.62 | 0.07 | 0.66 | 0.15 | 0.53 | 0.11 | 0.55 |
| | 0.11 | 0.64 | 0.16 | 0.68 | 0.15 | 0.66 | 0.18 | 0.54 | 0.20 | 0.58 |
| | 0.19 | 0.86 | 0.20 | 0.86 | 0.16 | 0.67 | 0.22 | 0.60 | 0.21 | 0.81 |
| | 0.25 | 0.95 | 0.23 | 1.00 | 0.23 | 0.89 | 0.28 | 0.91 | 0.23 | 0.83 |
| | 0.33 | 1.08 | 0.25 | 1.11 | 0.23 | 1.00 | 0.31 | Skirt (0.02) | 0.24 | 0.92 |
| | 0.46 | | 0.33 | | 0.35 | | 0.38 | | 0.25 | |
| | Battery | | 0.35 | | 0.39 | | 0.43 | | 0.25 | |
| | | | 0.38 | | 0.40 | | 0.49 | | 0.33 | |
| | | | 0.46 | | 0.43 | | 0.53 | | 0.40 | |
| | | | 0.57 | | 0.45 | | 0.59 | | 0.42 | |
| | | | | | 0.55 | | Stuck (0.15) | | 0.45 | |
| | | | | | | | Skirt (0.22) | | 0.52 | |
| Minimum | 0.07 | 0.35 | 0.04 | 0.56 | 0.06 | 0.47 | 0.15 | 0.41 | 0.01 | 0.54 |
| Maximum | 0.46 | 1.08 | 0.57 | 1.11 | 0.55 | 1.00 | 0.59 | 0.91 | 0.52 | 0.92 |
| Average | 0.24 | 0.75 | 0.28 | 0.81 | 0.29 | 0.73 | 0.34 | 0.60 | 0.28 | 0.71 |
| Overlap | Yes | | Yes | | Yes | | Yes | | No | |
| H/W Errors | 1B, 1St | 1R | 1R | 0 | 2R | 0 | 1St, 1Sk | 1Sk | 3R | 1R |

**Table 0.V: Experiment 5 Final Distances (Size Ratio 1.60)**

| Experiment | 6A | | 6B | | 6C | | 6D | | 6E | |
|---|---|---|---|---|---|---|---|---|---|---|
| Group | S (0.20m) | M (0.28m) | S (0.20m) | M (0.28m) | S (0.20m) | M (0.28m) | S (0.20m) | M (0.28m) | S (0.20m) | M (0.28m) |
| Distance /m | 0.05 | 0.36 | 0.06 | 0.21 | 0.10 | 0.08 | 0.07 | 0.31 | 0.04 | 0.24 |
| | 0.09 | 0.61 | 0.10 | 0.49 | 0.16 | 0.48 | 0.17 | 0.49 | 0.09 | 0.46 |
| | 0.16 | 0.61 | 0.16 | 0.60 | 0.24 | 0.50 | 0.20 | 0.51 | 0.19 | 0.54 |
| | 0.18 | 0.62 | 0.17 | 0.74 | 0.26 | 0.64 | 0.23 | 0.67 | 0.21 | 0.60 |
| | 0.19 | 0.67 | 0.25 | 0.74 | 0.28 | 0.66 | 0.23 | 0.75 | 0.22 | 0.71 |
| | 0.26 | 0.90 | 0.33 | 0.98 | 0.29 | 0.84 | 0.31 | 0.78 | 0.24 | Skirt (0.09) |
| | 0.30 | | 0.34 | | 0.30 | | 0.35 | | 0.32 | |
| | 0.30 | | 0.42 | | 0.38 | | 0.37 | | 0.32 | |
| | 0.31 | | 0.43 | | 0.48 | | 0.38 | | 0.46 | |
| | 0.33 | | 0.45 | | 0.50 | | 0.42 | | 0.50 | |
| | 0.44 | | 0.49 | | 0.54 | | 0.47 | | 0.54 | |
| | 0.50 | | 0.49 | | 0.58 | | 0.66 | | 0.55 | |
| | 0.57 | | Stuck (0.26) | | Skirt (0.11) | | Skirt (0.08) | | 0.62 | |
| Minimum | 0.05 | 0.36 | 0.06 | 0.21 | 0.10 | 0.08 | 0.07 | 0.31 | 0.04 | 0.24 |
| Maximum | 0.57 | 0.90 | 0.49 | 0.98 | 0.58 | 0.84 | 0.66 | 0.78 | 0.62 | 0.71 |
| Average | 0.28 | 0.63 | 0.31 | 0.63 | 0.34 | 0.53 | 0.32 | 0.59 | 0.33 | 0.51 |
| Overlap | Yes | | Yes | | Yes | | Yes | | Yes | |
| H/W Errors | 3R | 1R | 1St, 2R | 0 | 1Sk | 1R | 1Sk | 0 | 1R | 1Sk, 1R |

**Table 0.VI: Experiment 6 Final Distances (Size Ratio 1.40)**

| Experiment | 7A | | 7B | | 7C | | 7D | | 7E | |
|---|---|---|---|---|---|---|---|---|---|---|
| Group | S (0.20m) | M (0.24m) | S (0.20m) | M (0.24m) | S (0.20m) | M (0.24m) | S (0.20m) | M (0.24m) | S (0.20m) | M (0.24m) |
| Distance /m | 0.01 | 0.34 | 0.10 | 0.30 | 0.12 | 0.55 | 0.08 | 0.43 | 0.09 | 0.43 |
| | 0.10 | 0.45 | 0.11 | 0.52 | 0.13 | 0.55 | 0.19 | 0.45 | 0.20 | 0.45 |
| | 0.18 | 0.46 | 0.17 | 0.58 | 0.19 | 0.60 | 0.19 | 0.58 | 0.23 | 0.51 |
| | 0.19 | 0.55 | 0.20 | 0.81 | 0.20 | 0.68 | 0.19 | 0.72 | 0.24 | 0.60 |
| | 0.26 | 0.62 | 0.28 | Battery | 0.22 | 0.70 | 0.20 | 0.93 | 0.26 | 0.74 |
| | 0.27 | 0.85 | 0.30 | Skirt (0.09) | 0.25 | Skirt (0.08) | 0.25 | Stuck (0.15) | 0.31 | Skirt (0.06) |
| | 0.34 | | 0.30 | | 0.28 | | 0.27 | | 0.31 | |
| | 0.36 | | 0.33 | | 0.29 | | 0.33 | | 0.39 | |
| | 0.39 | | 0.38 | | 0.33 | | 0.36 | | 0.44 | |
| | 0.40 | | 0.40 | | 0.35 | | 0.41 | | 0.57 | |
| | 0.51 | | 0.42 | | 0.40 | | 0.47 | | 0.63 | |
| | 0.54 | | 0.43 | | 0.50 | | 0.62 | | 0.64 | |
| | 0.55 | | 0.59 | | 0.56 | | 0.68 | | Skirt (0.07) | |
| Minimum | 0.01 | 0.34 | 0.10 | 0.30 | 0.12 | 0.55 | 0.08 | 0.43 | 0.09 | 0.43 |
| Maximum | 0.55 | 0.85 | 0.59 | 0.81 | 0.56 | 0.70 | 0.68 | 0.93 | 0.64 | 0.74 |
| Average | 0.32 | 0.55 | 0.31 | 0.55 | 0.29 | 0.62 | 0.33 | 0.62 | 0.36 | 0.55 |
| Overlap | Yes | | Yes | | Yes | | Yes | | Yes | |
| H/W Errors | 2R | 1R | 3R | 1B, 1Sk | 5R | 1R, 1Sk | 1R | 1St | 3R, 1Sk | 1Sk |

**Table 0.VII: Experiment 7 Final Distances (Size Ratio 1.20)**

| Experiment | 8A | | 8B | | 8C | | 8D | | 8E | |
|---|---|---|---|---|---|---|---|---|---|---|
| Group | S (0.20m) | M (0.60m) | S (0.20m) | M (0.60m) | S (0.20m) | M (0.60m) | S (0.20m) | M (0.60m) | S (0.20m) | M (0.60m) |
| Distance /m | 0.08 | 0.63 | 0.05 | 0.49 | 0.06 | 0.63 | 0.08 | 0.56 | 0.09 | 0.52 |
| | 0.11 | 0.66 | 0.17 | 0.78 | 0.15 | 0.71 | 0.12 | 0.71 | 0.11 | 0.66 |
| | 0.18 | 0.75 | 0.17 | 1.02 | 0.17 | 0.99 | 0.13 | 0.75 | 0.13 | 0.73 |
| | 0.20 | 1.46 | 0.17 | 1.22 | 0.27 | 1.33 | 0.14 | 1.30 | 0.19 | 1.29 |
| | 0.20 | 1.54 | 0.21 | 1.61 | 0.29 | 1.59 | 0.21 | 1.36 | 0.24 | 1.31 |
| | 0.23 | Stuck (1.19) | 0.25 | Stuck (1.38) | 0.29 | 1.70 | 0.29 | 1.80 | 0.25 | 1.62 |
| | 0.27 | | 0.28 | | 0.38 | | 0.32 | | 0.25 | |
| | 0.30 | | 0.36 | | 0.38 | | 0.33 | | 0.27 | |
| | 0.30 | | 0.37 | | 0.38 | | 0.33 | | 0.36 | |
| | 0.32 | | 0.38 | | 0.40 | | 0.35 | | 0.43 | |
| | 0.36 | | 0.38 | | 0.59 | | 0.35 | | 0.44 | |
| | 0.42 | | 0.40 | | 0.73 | | 0.58 | | 0.51 | |
| | 0.57 | | 0.71 | | Stuck (0.17) | | 0.62 | | 0.73 | |
| Minimum | 0.08 | 0.63 | 0.05 | 0.49 | 0.06 | 0.63 | 0.08 | 0.56 | 0.09 | 0.52 |
| Maximum | 0.57 | 1.54 | 0.71 | 1.61 | 0.73 | 1.70 | 0.62 | 1.80 | 0.73 | 1.62 |
| Average | 0.27 | 1.01 | 0.30 | 1.02 | 0.34 | 1.16 | 0.30 | 1.08 | 0.31 | 1.02 |
| Overlap | No | | Yes | | Yes | | Yes | | Yes | |
| H/W Errors | 0 | 1St | 2R | 1St | 1St | 2R | 2R | 0 | 3R | 1B |

**Table 0.VIII: Experiment 8 Final Distances (Size Ratio 3.00)**

| Experiment | 9A | | 9B | | 9C | | 9D | | 9E | |
|---|---|---|---|---|---|---|---|---|---|---|
| Group | S (0.20m) | M (0.50m) | S (0.20m) | M (0.50m) | S (0.20m) | M (0.50m) | S (0.20m) | M (0.50m) | S (0.20m) | M (0.50m) |
| Distance /m | 0.04 | 0.61 | 0.06 | 0.44 | 0.04 | 0.57 | 0.08 | 0.45 | 0.07 | 0.74 |
| | 0.17 | 0.65 | 0.12 | 0.86 | 0.13 | 0.81 | 0.09 | 0.73 | 0.07 | 0.81 |
| | 0.18 | 0.73 | 0.15 | 1.09 | 0.18 | 0.84 | 0.11 | 0.92 | 0.13 | 1.19 |
| | 0.19 | 1.51 | 0.23 | 1.38 | 0.20 | 1.35 | 0.18 | 1.34 | 0.16 | 1.34 |
| | 0.23 | 1.78 | 0.24 | 1.68 | 0.21 | 1.40 | 0.20 | 1.86 | 0.24 | 1.81 |
| | 0.26 | Selector | 0.30 | Selector | 0.27 | Selector | 0.25 | Selector | 0.26 | Selector |
| | 0.30 | | 0.31 | | 0.30 | | 0.30 | | 0.26 | |
| | 0.33 | | 0.35 | | 0.31 | | 0.31 | | 0.28 | |
| | 0.35 | | 0.37 | | 0.35 | | 0.35 | | 0.30 | |
| | 0.38 | | 0.41 | | 0.38 | | 0.41 | | 0.37 | |
| | 0.47 | | 0.54 | | 0.41 | | 0.42 | | 0.37 | |
| | 0.51 | | 0.63 | | 0.49 | | 0.46 | | 0.43 | |
| | 0.59 | | Battery | | 0.51 | | 0.47 | | 0.46 | |
| Minimum | 0.04 | 0.61 | 0.06 | 0.44 | 0.04 | 0.57 | 0.08 | 0.45 | 0.07 | 0.74 |
| Maximum | 0.59 | 1.78 | 0.63 | 1.68 | 0.51 | 1.40 | 0.47 | 1.86 | 0.46 | 1.81 |
| Average | 0.31 | 1.06 | 0.31 | 1.09 | 0.29 | 0.99 | 0.28 | 1.06 | 0.26 | 1.18 |
| Overlap | No | | Yes | | No | | Yes | | No | |
| H/W Errors | 5R | 2R | 4R | 2R | 4R | 1R | 3R | 2R | 1Sk | 1R, 1B |

**Table 0.IX: Experiment 9 Final Distances (Size Ratio 2.50)**

| Experiment | 10A | | | 10B | | | 10C | | | 10D | | | 10E | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | S (0.20m) | M (0.30m) | L (0.45m) | S (0.20m) | M (0.30m) | L (0.45m) | S (0.20m) | M (0.30m) | L (0.45m) | S (0.20m) | M (0.30m) | L (0.45m) | S (0.20m) | M (0.30m) | L (0.45m) |
| Distance /m | 0.12 | 0.06 | 0.92 | 0.11 | 0.46 | 1.28 | 0.09 | 0.53 | 0.95 | 0.09 | 0.38 | 1.12 | 0.08 | 0.43 | 0.88 |
| | 0.26 | 0.64 | 1.07 | 0.14 | 0.56 | 1.68 | 0.10 | 0.56 | 1.16 | 0.11 | 0.52 | 1.47 | 0.09 | 0.59 | 1.36 |
| | 0.27 | 0.70 | | 0.18 | 0.64 | | 0.16 | 0.64 | | 0.11 | 0.60 | | 0.11 | 0.60 | |
| | 0.27 | 0.89 | | 0.19 | 0.70 | | 0.22 | 0.69 | | 0.19 | 0.66 | | 0.18 | 0.74 | |
| | 0.28 | 0.95 | | 0.22 | 0.73 | | 0.24 | 0.73 | | 0.20 | 0.76 | | 0.20 | 0.81 | |
| | 0.35 | Skirt (0.17) | | 0.25 | 0.94 | | 0.33 | 0.81 | | 0.25 | 1.17 | | 0.26 | 1.03 | |
| | 0.35 | | | 0.27 | | | 0.33 | | | 0.31 | | | 0.26 | | |
| | 0.44 | | | 0.27 | | | 0.35 | | | 0.35 | | | 0.37 | | |
| | 0.53 | | | 0.41 | | | 0.40 | | | 0.35 | | | 0.41 | | |
| | Battery | | | 0.42 | | | 0.43 | | | 0.36 | | | 0.73 | | |
| | Battery | | | 0.63 | | | 0.49 | | | 0.38 | | | 0.80 | | |
| Minimum | 0.12 | 0.06 | 0.92 | 0.11 | 0.46 | 1.28 | 0.09 | 0.53 | 0.95 | 0.09 | 0.38 | 1.12 | 0.08 | 0.43 | 0.88 |
| Maximum | 0.53 | 0.95 | 1.07 | 0.63 | 0.94 | 1.68 | 0.49 | 0.81 | 1.16 | 0.38 | 1.17 | 1.47 | 0.80 | 1.03 | 1.36 |
| Average | 0.32 | 0.65 | 0.995 | 0.28 | 0.67 | 1.48 | 0.29 | 0.66 | 1.055 | 0.25 | 0.68 | 1.295 | 0.32 | 0.70 | 1.12 |
| Overlap | | Yes | Yes | | Yes | No | | No | No | | Yes | Yes | | Yes | Yes |
| H/W Errors | 1R | 1R | 1R | 4R | 1R | 1R | 2R | 0 | 0 | 3R | 0 | 1R | 3R | 1R | 1R |

**Table 0.X: Experiment 10 Final Distances (Size Ratio 1.50)**

| Experiment | 11A | | |
|---|---|---|---|
| Group | S (0.20m) | M (0.30m) | L (0.45m) |
| Distance /m | 0.05 | 0.45 | 1.07 |
| | 0.05 | 0.53 | 1.21 |
| | 0.12 | 0.53 | |
| | 0.15 | 0.87 | |
| | 0.20 | 0.89 | |
| | 0.22 | 0.99 | |
| | 0.25 | | |
| | 0.34 | | |
| | 0.38 | | |
| | 0.41 | | |
| | 0.63 | | |
| Minimum | 0.05 | 0.45 | 1.07 |
| Maximum | 0.63 | 0.99 | 1.21 |
| Average | 0.25 | 0.71 | 1.14 |
| Overlap | | Yes | No |
| H/W Errors | 2R | 0 | 0 |

**Table 0.XI: Experiment 11 Final Distances (Size Ratio 1.50)**