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A Appendix

A.1 Test Bed for Tracking the Robot OSCAR-X during the Experiments

The tracking of the robot’s walking was done with a web camera and specially made tracking software utilizing the OpenCV library [Ope09] and its methods for blob tracking. There were also one red and one green circle placed on the robot (Figure A.1). The red circle was mounted on the back of the robot between legs 0 and 5 (Figure A.1, Figure A.3), the green circle on the front of the robot between legs 2 and 3 (Figure A.1, Figure A.3). The colored circles are recognized by the tracking software and a vector pointing from the red circle to the green circle shows the direction in which the robot is walking.

The test setup is presented in Figure A.2. The web camera is positioned about 4.5 meters above the terrain on which the robot is walking. The camera is connected to the computer (PC) where the tracking, recording of video, and logging of the orientation of the robot is done by the specially prepared tracking software.

![Fig. A.1 Setup of the robot OSCAR-X with red and green indicators that aid in tracking with camera.](image)
Fig. A.2 Schematic of the tracking setup for robot's walking with the web camera and a specially developed tracking software running on a computer (PC).

Fig. A.3 Model of a hexapod robot with its legs numbered.
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Keywords

## Glossary

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<tr>
<td>AIS</td>
<td>Artificial Immune System</td>
</tr>
<tr>
<td>BCU</td>
<td>Basic Control Unit</td>
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<tr>
<td>CPG</td>
<td>Central Pattern Generator</td>
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<tr>
<td>DAQ</td>
<td>Data acquisition</td>
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<tr>
<td>DOF</td>
<td>Degrees Of Freedom</td>
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<tr>
<td>OCU</td>
<td>Organic Control Unit</td>
</tr>
<tr>
<td>RADE</td>
<td>Robot Anomaly Detection Engine</td>
</tr>
<tr>
<td>S.I.R.R.</td>
<td>Swarm Intelligence for Robot Reconfiguration</td>
</tr>
<tr>
<td>OSCAR</td>
<td>Organic Self Configuring and Adapting Robot</td>
</tr>
<tr>
<td>ORCA</td>
<td>Organic Robot Control Architecture</td>
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<tr>
<td>PC</td>
<td>Personal Computer</td>
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<tr>
<td>S2-HuRo</td>
<td>Self Stabilizing Humanoid Robot</td>
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<td>SelSta</td>
<td>Self-Stabilization (Approach)</td>
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<td>SymbScore</td>
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<td>Zero Moment Pole</td>
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