

Materials List for:

# Insect-controlled Robot: A Mobile Robot Platform to Evaluate the Odor-tracking Capability of an Insect

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## Materials

| Name                                       | Company              | Catalog Number | Comments   |
|--|----------------------|----------------|--|
| Male adult silkmoth ( <i>Bombyx mori</i> ) |                      |                | Rear from eggs, or purchase as pupae.  |
| Incubator                                  | Panasonic            | MIR-254        | Store pupae or adult silkmoths at a constant temperature, 238 L.   |
| Plastic box                                | Sunplatec            | O-3            | Store pupae or adult silkmoths, 299 × 224 × 62 mm L × W × H.   |
| Copper wire                                |                      |                | 2-mm diameter for the attachment. Any rigid bar can be used as an alternative for making the attachment to tether a silkmoth.  |
| Plastic sheet                              | Kokuyo               | VF-1420N       | Sold as overhead projector film with thickness of 0.1 mm. Use at the tip of the attachment.  |
| Forceps                                    | As one               | 5SA            | Remove scales on the thorax.   |
| Adhesive                                   | Konishi              | G17            | Bond a silkmoth to the attachment.   |
| Insect-controlled robot                    | Custom               |                | Bearing an air-supported treadmill, an optical sensor, custom-built AVR-based microcontroller boards, and two DC brushless motors. It is powered by 8 × AA and 3 × 006P batteries. |
| Microcontroller                            | Atmel                | ATMEGA8        | A component of the insect-controlled robot.  |
| DC blower                                  | Nidec                | A34342-55      | A component of the insect-controlled robot for floating a ball in an air-supported treadmill.  |
| DC fan                                     | Minebea              | 1606KL-04W-B50 | A component of the insect-controlled robot for suctioning air containing an odor.  |
| Optical mouse sensor                       | Agilent technologies | HDNS-2000      | A component of the insect-controlled robot, obtained from an optical mouse (M-GUWSRSV, Elecom, Japan).   |
| Brushless motor                            | Maxon                | EC-45          | A component of the insect-controlled robot for driving a wheel.  |
| White polystyrene ball                     |                      |                | A component of the insect-controlled robot. Diameter 50 mm, mass approximately 2 g.  |
| Bombykol: (E,Z)-10,12-hexadecadien-1-ol    | Shin-Etsu chemical   |                | Custom synthesis.  |
| n-hexane                                   | Wako                 | 085-00416      | Solvent for bombykol.  |
| Wind tunnel                                | Custom               |                | Pulling-air type, sized 1,800 × 900 × 300 mm L × W × H.  |

|                   |        |            |  |
|-------------------|--------|------------|--|
| BioSignal program | Custom |            | A program to establish serial communication between the insect-controlled robot and a PC via Bluetooth. Used for sending commands to start/stop the robot or configuring its motor properties. |
| Camcorder         | Sony   | HDR-XR520V | Capture robot movements.   |