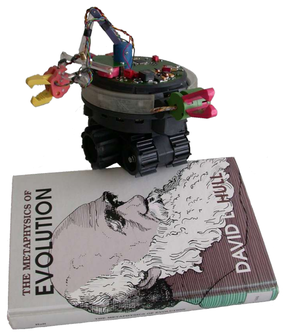


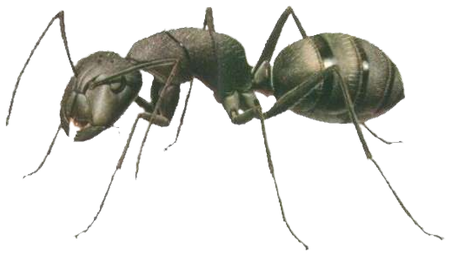
From s-bot to SWARM-BOT

Project's web site: http://www.swarm-bots.org

FET

Autonomous System Lab

S-bot : a highly mobile robot, with 9 DOF, high computation power and plenty of sensors



Sensors :

- 1 VGA camera
- 4 microphones + 2 speakers
- 19 IR distance (15 around, 4 bottom).
- 4 accelerometers (3D orientation)
- 2 humdity and temperature
- position and torque on all motors
- color light and sensor ring
- optical barrier in gripper

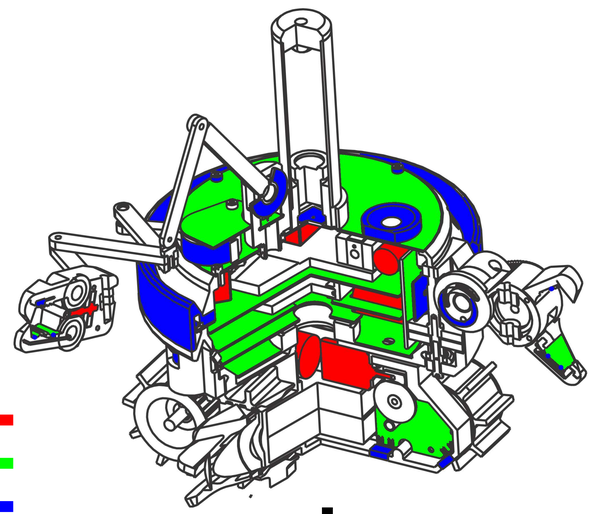
Computation :

- XScale 32 bits ARM CPU @ 400 Mhz. 64 MB RAM and 32 MB Flash.
- CompactFlash for storage and wireless ethernet.
- Linux operating system
- 12 PIC µC @ 20 Mhz
- I^2C bus.

Actuators :

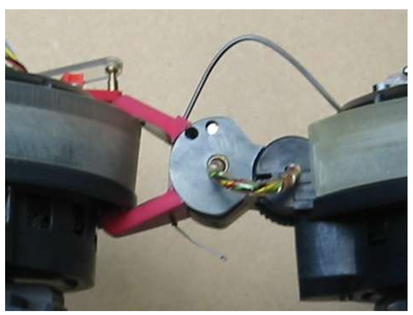
- 2 Treels© (2 DOF)
- Turret (1 DOF)
- "Fixed" gripper (2 DOF)
- "Mobile" gripper (4 DOF)

Total : 9 DOF, 6 motors, 3 servos

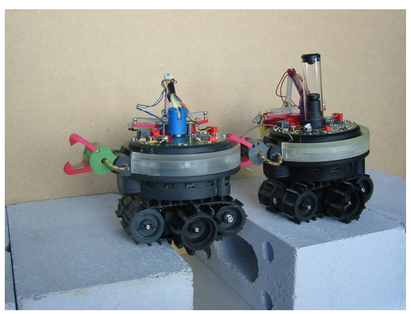


SWARM-BOT : an higher level structure, consisting in s-bots connected together

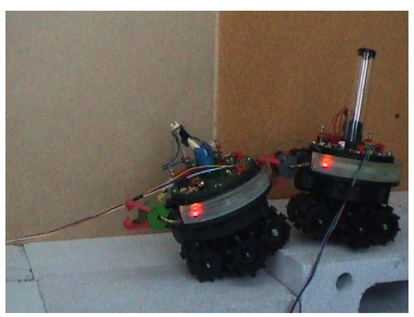
Gripper



Passing a gap



Passing a step



In these examples, the SWARM-BOT is built of s-bots interconnected using their "fixed" gripper. The "fixed" gripper has a degree of freedom with sufficient torque to lift and hold another s-bot.
Then the SWARM-BOT can pass a gap or a step that would have been too big for a single s-bot. This approach finds its theoretical roots in recent studies in the field of swarm intelligence.