

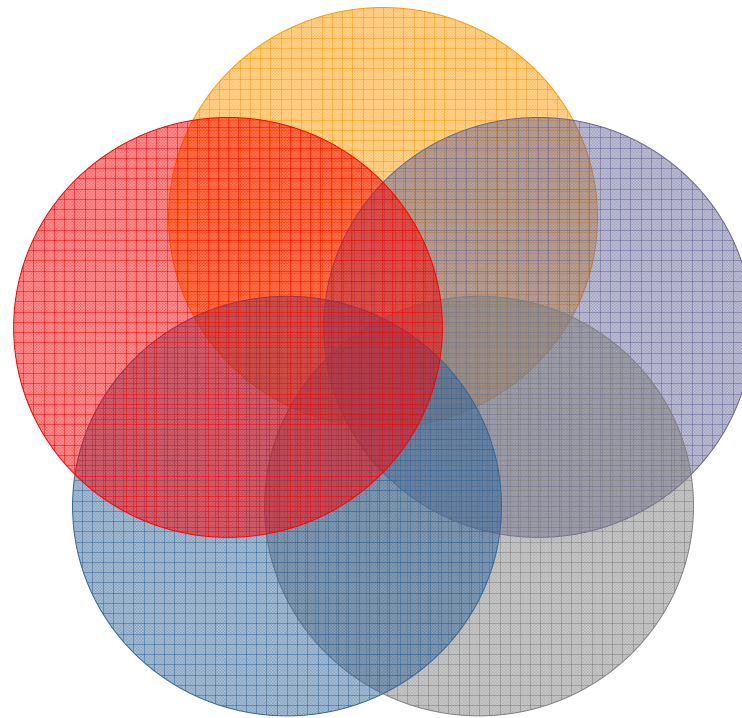


传感器智能

网络机器人

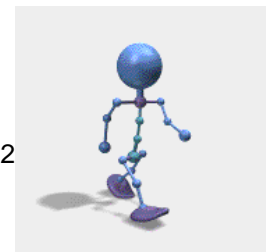
智能传感器

分布式计算



逻辑传感器

多传感器融合





逻辑传感器[Henderson84]

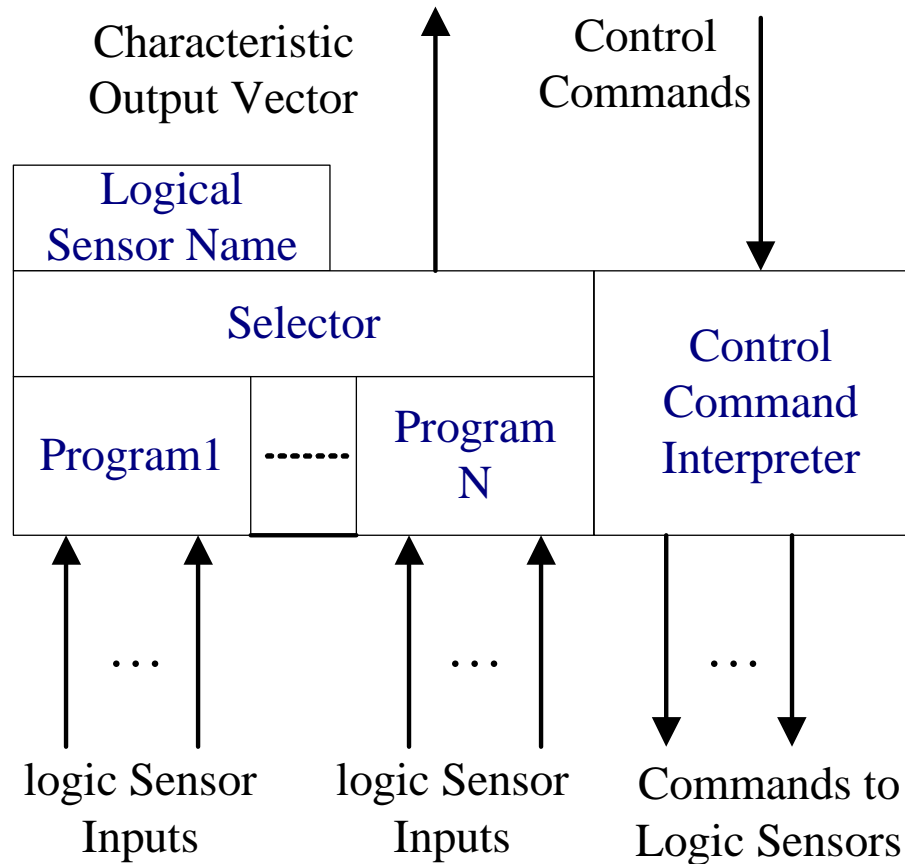
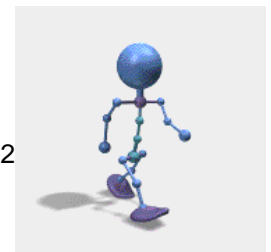


图2.2.1 逻辑传感器





逻辑传感器

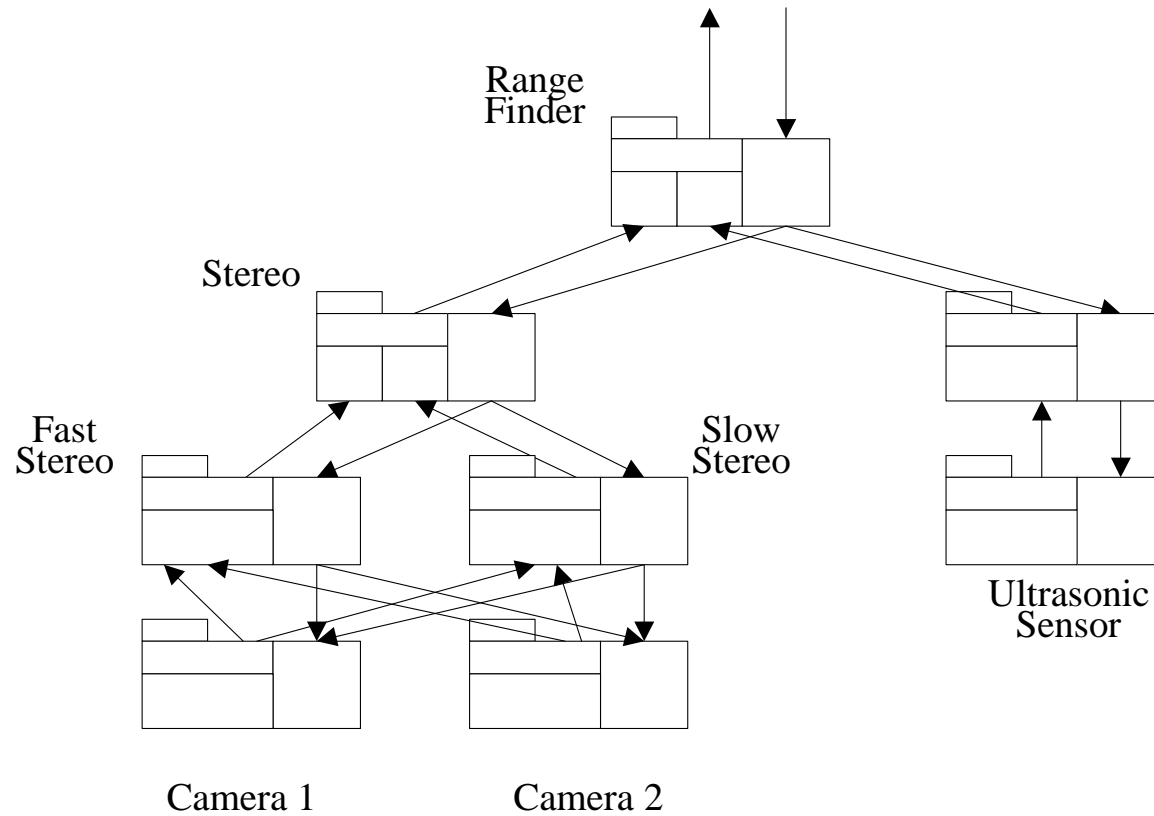
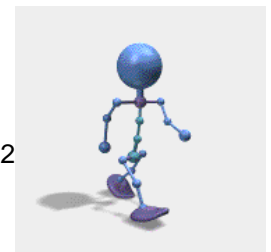


图2.2.2 测距逻辑传感器网络

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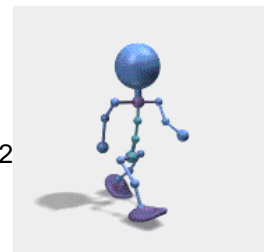
逻辑传感器

○ 特点:

- 逻辑处理与具体硬件环境无关
- 基于功能的模块化设计思想
- 提供了一种统一的功能设计规范

○ 实现

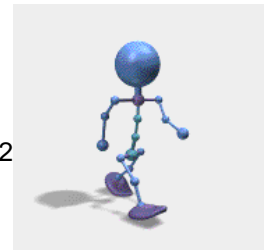
- [Hende84] 数据库中的可执行代码, C-LSS/FUN-LSS





Smart/Intelligent Sensor

- 自补偿
 - 偏差补偿，如ADC
 - 增益补偿，如通过可变成增益实现
 - 线性补偿，如通过查表实现
 - 温度补偿





Smart/Intelligent Sensor

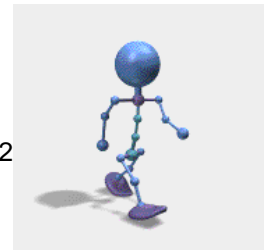
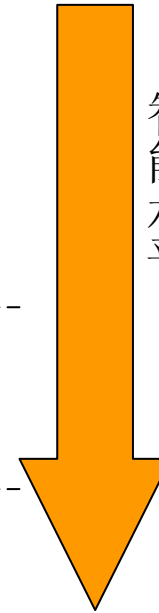
○ 计算

- 信号调谐（如滤波）
- 信号转换（如A/D）

- 逻辑功能（出发事件）
- 数据压缩（特征提取）

- 决策（分类，决策）

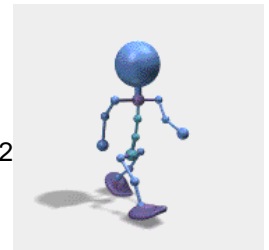
智能水平





Smart/Intelligent Sensor

- 通讯
- 多模态集成 (Multimodal Integration)





Smart/Intelligent Sensor

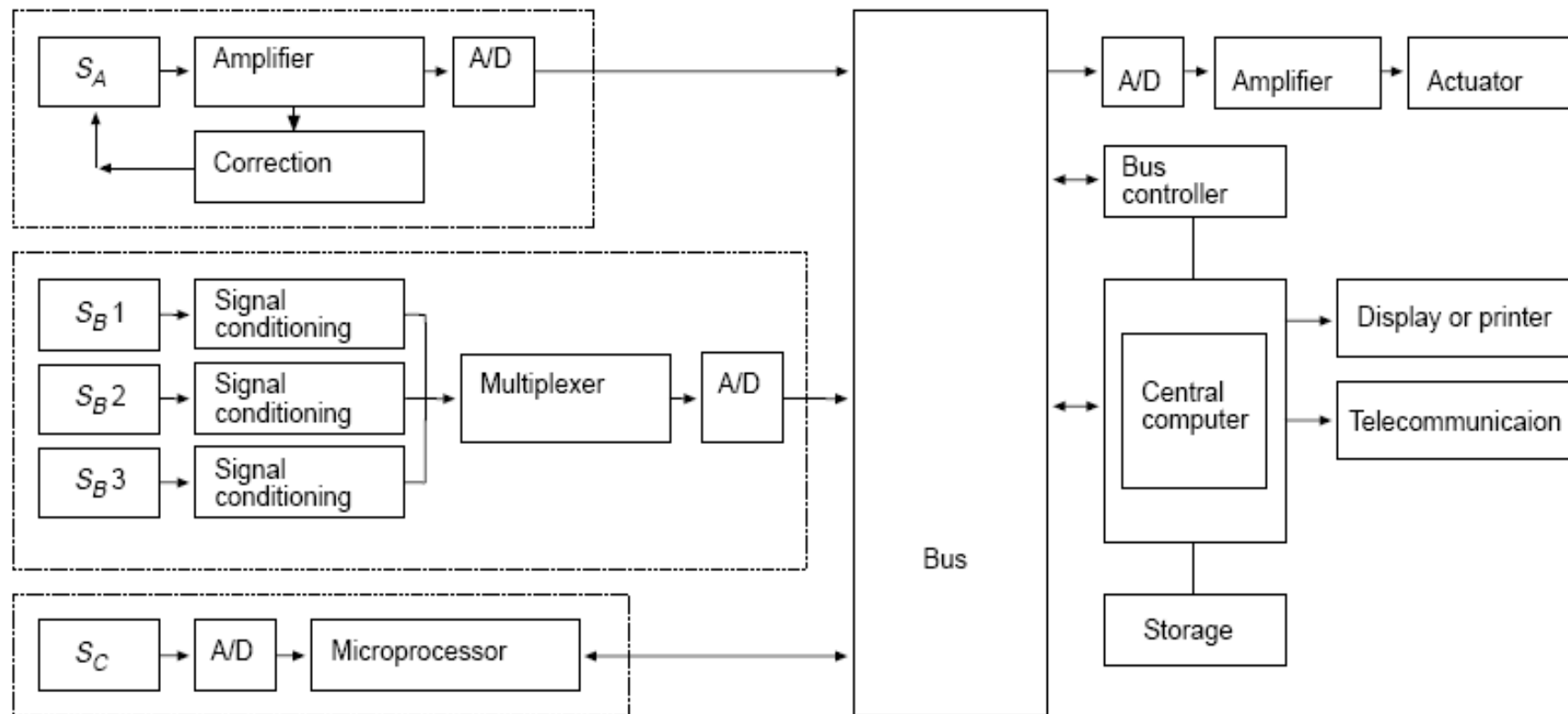
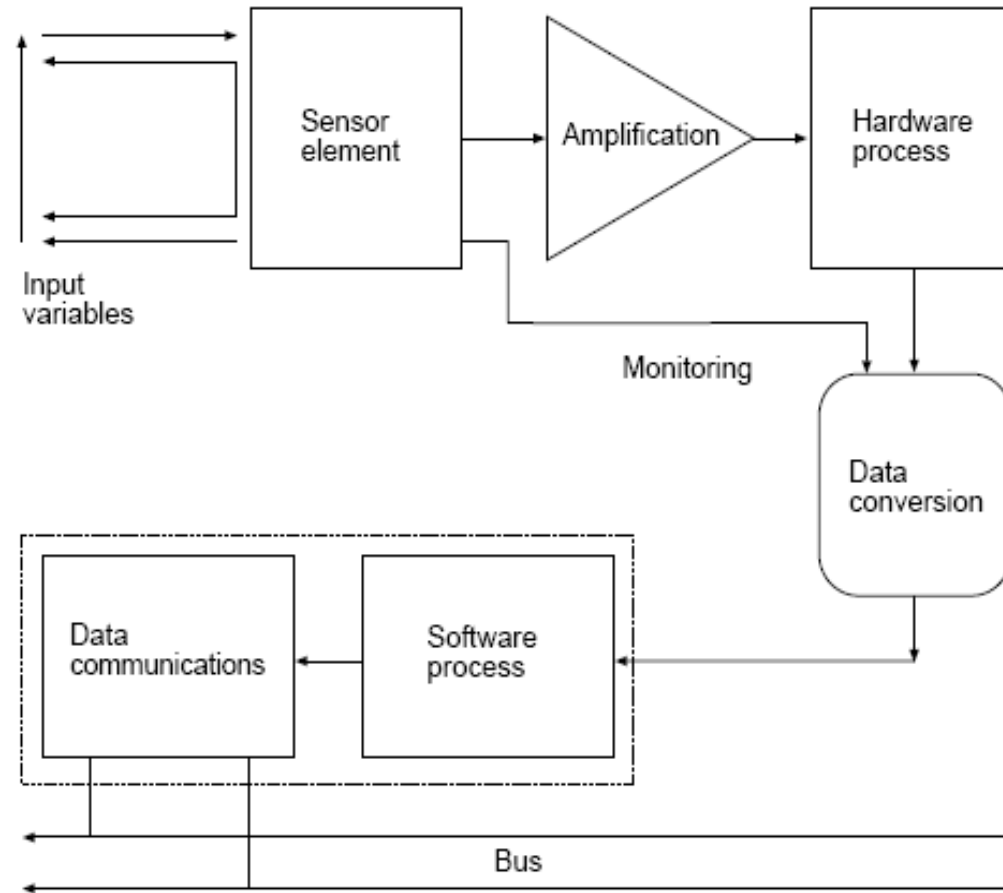


Figure 1. Schematic of a digital sensor bus interface structure



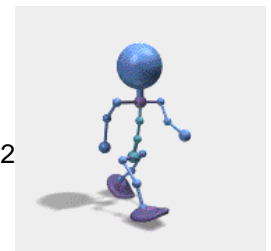


Smart/Intelligent Sensor



Source: [3]

Figure 4. Elements of an intelligent sensor



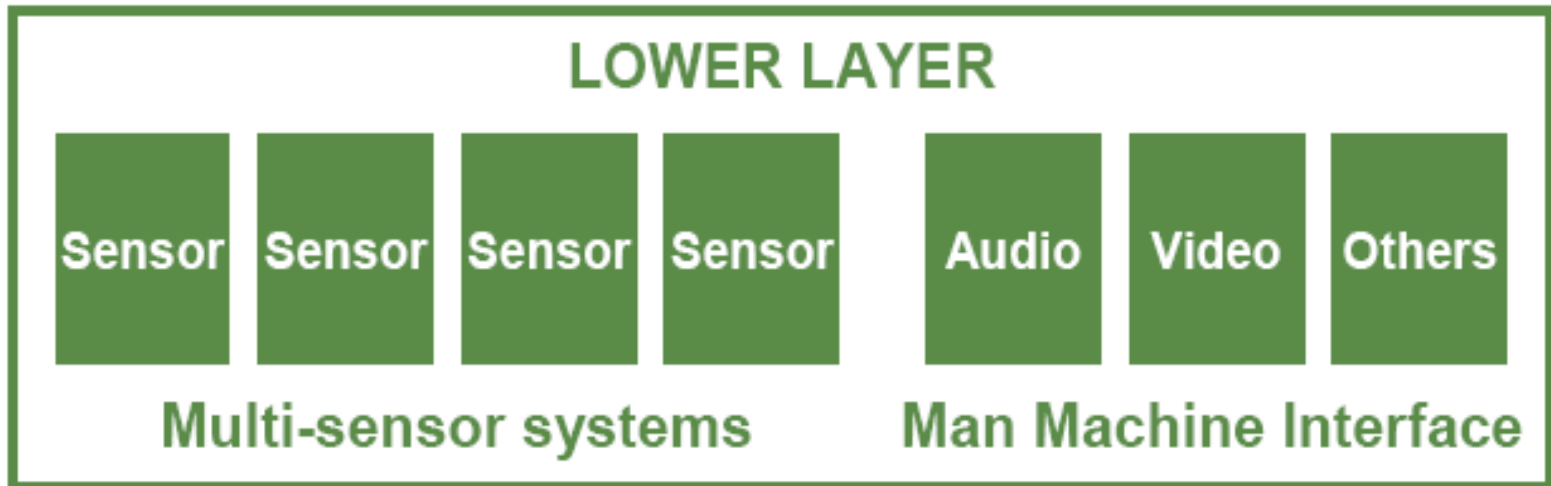
Hierarchical system structure



UPPER LAYER
Knowledge Processing

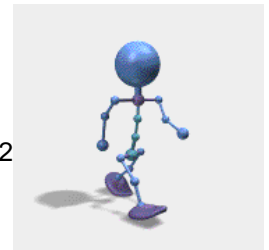
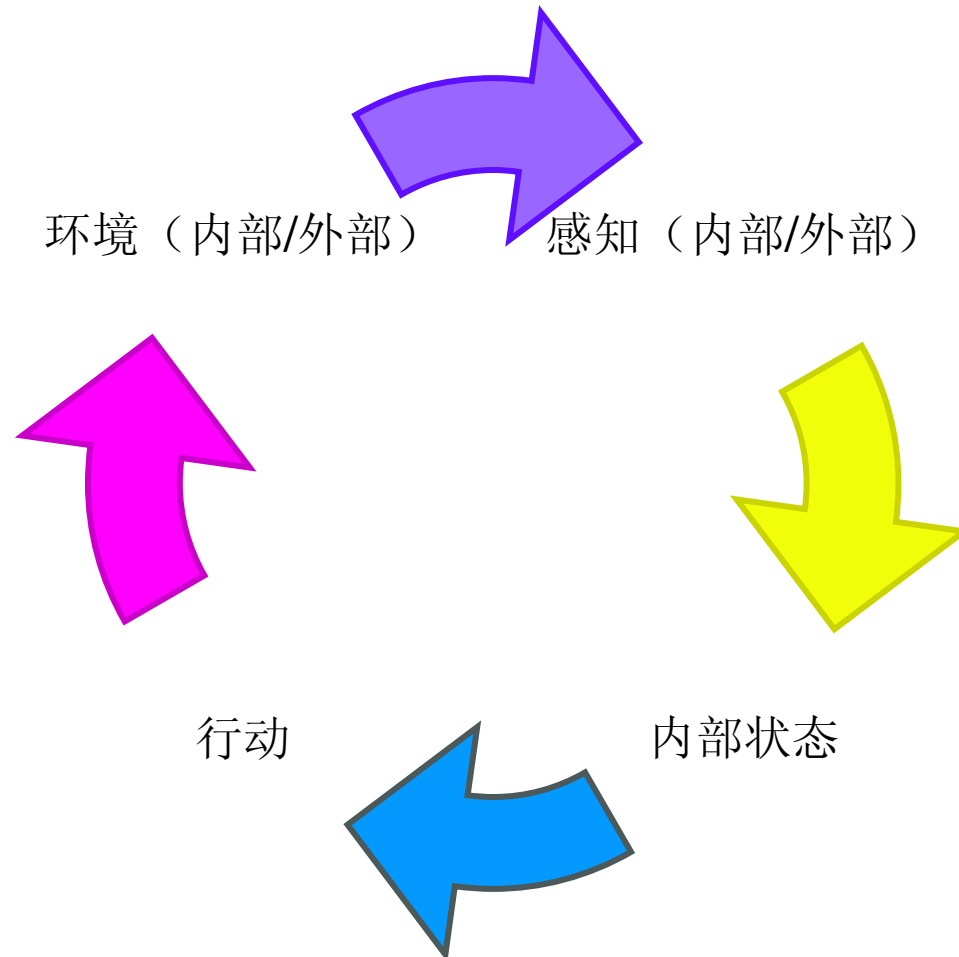
MIDDLE LAYER
Information Processing

MIDDLE LAYER
Info. Processing



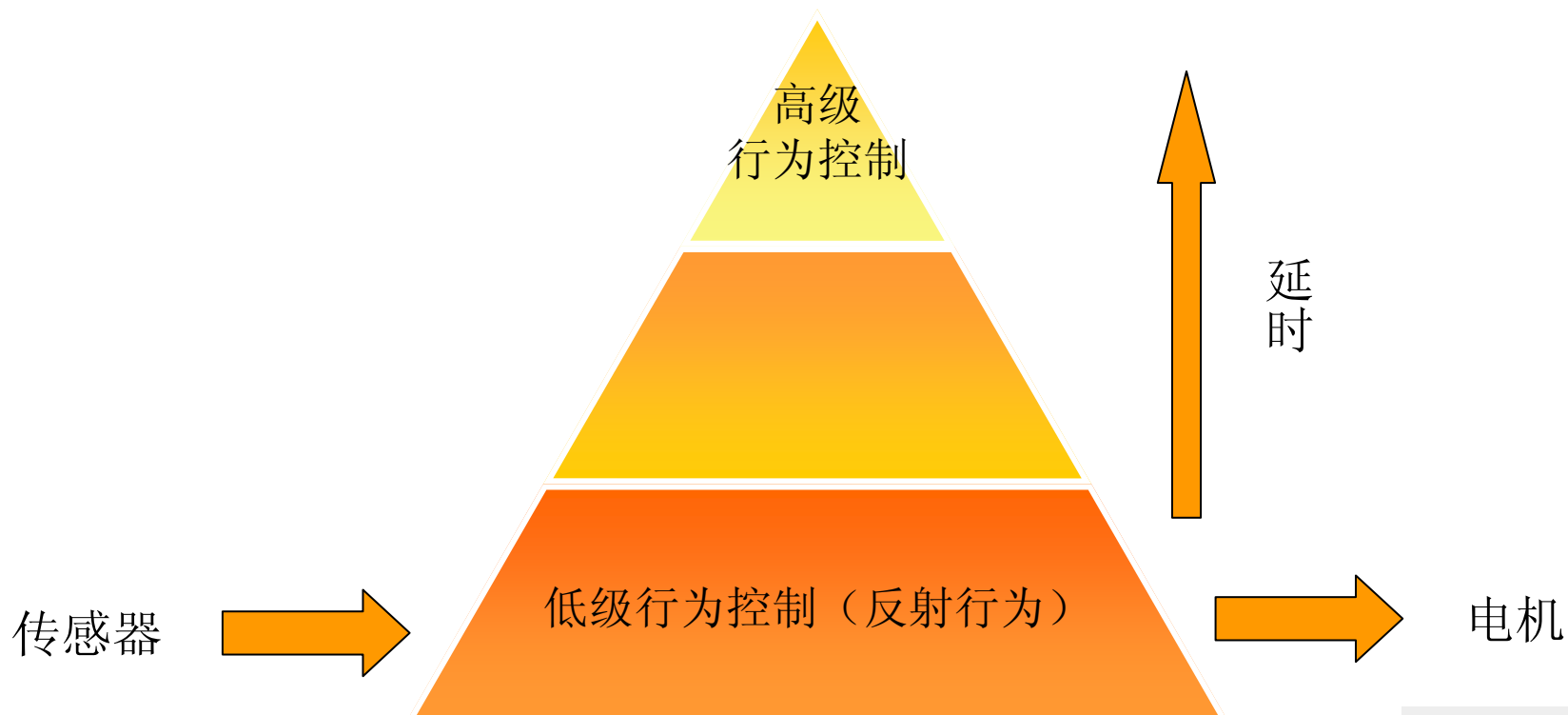


智能传感器控制结构





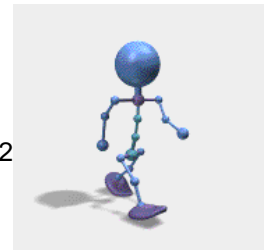
智能传感器控制结构





智能传感器控制结构

- 底层
 - 分布式信号处理：信号增强、自我维护
- 中层
 - 特征提取
 - 多传感器集成
 - 参数调节
- 顶层
 - 知识提取





智能传感器控制结构

○ 例子:

- 引擎压力、温度、气体流量，不仅输出测量结果，而且直接参与控制。

