CSCI 1108
Review
The Sense-Decide-Act Loop

Sense → Decide → Act

Controller

Goal
Sensor model

Characterizing sensors

\[ m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1000 - 3800}{9 - 2} \approx -400 \]

\[ x = 2, \ y = 3800 \]

\[ y = mx + b \Rightarrow 3800 = -400 \times 2 + b \]

\[ b = 4600 \]

\[ y = mx + b \Rightarrow y = -400x + 4600 \]

Sensors are not perfect
Motion model

Internal model: Calculate from motor commands (such as run the left motor for 2 seconds) the new position (pose)

Again need experiments to calibrate the parameterized model
Combining observations (sensors) and motion (actuators) models

Examples:

**Odometry** is the use of data from motion sensors to estimate change in position over time (Wikipedia)

**Localization:** More general techniques such as Kalman filter, and even SLAM
Programing in event-based framework with ASEBA

Event, Event handler, basic constructs like variables and constants, loops, conditional statements, lists, on event, subroutine
High level program planning: State Transition Diagrams

What are states?
What are transition?
Why is this useful?
Failure of strategy and

Debugging errors in the code

Detection and mediation
Advanced topics

**Search:** Some search methods

**Localization:** Bayes localization versus point estimates

**Object recognition:** Pattern matching

**PID:** Set point, why is this useful?
Team Work and Project Management

Teaming
Gantt charts
Components in Project Management