LAIKA – AIBO RESEARCH

GROUP 2
MIDTERM PRESENTATION
PLAN

• 2 WEEKS (PHASE I):
  – DO DEMOS AND RESEARCH ALGORITHMS BY OTHER PEOPLE (GET TO KNOW AIBO AND LEARN HOW TO PROGRAM IN ENVIRONMENT)

• 2 WEEKS (PHASE II):
  – RESEARCH ALGORITHMS AND WRITE SIMPLE CODES
PLAN (con’t)

• 4 WEEKS
  – RECOGNIZE PERSON STANDING IN POSITION
  – MIDTERM PRESENTATION
  – SPEECH RECOGNITION AND OPTIONS
  – HARDCODING ENVIRONMENTS AND ALTERNATIVE PATHS
PLAN (con’t)

• 2 WEEKS (PHASE IV):
  – PUT EVERYTHING TOGETHER AND WORK ON EXTRA THINGS IF THERE IS TIME

• 1 WEEK (PHASE V):
  – PRESENTATION AND CONCLUSIONS
State Machine Overview

- Locate Wall
- Move toward the wall
- Move Straight relative to the wall
- Wait…
- Start Node
Start Node

- Get into lie down position
- Flash head button
- Detect button for transition
Locate Wall Node

• Position head for scanning mode
• Locate the closest object in the environment
• Prepare to move
• Turn the body perpendicular to the object
• Detect for state completion signal
Move Toward the Wall

• Walk toward the wall
• Constantly Update the distance from the wall
• Stop at a predefined distance from the wall
• Turn to the side
Move Straight

• Direction is relative to the wall
• Get distance from the wall
• Open loop control
IMAGE RECOGNITION

- Able to recognize solid color objects
- Able to recognize patterned objects (depending on lighting)
IMAGE RECOGNITION (con’t)

• Solid color:

• Pattern:
IMAGE RECOGNITION (con’t)
The Original Idea

Wait

- Detection of person
- Clap heard

Introduction intro.wav
- Timer finishes
- Clap heard

Option 1 op1.wav
- Timer finishes
- Clap heard

Option 2 op2.wav
- Timer finishes
- Clap heard

Ask for repeat rep.wav
- Completion
- Timer finishes

Action 1
- Completion

Action 2
Advantages of Design

• Easy method of determining which option the person picks
• Sets up loop of user interaction
State Machines in Tekkotsu

• Preset nodes:
  – SoundNode
  – HeadPointerNode
  – LedNode
  – TailwagNode
  – WalkNode
  – MotionSequenceNode

• Preset transitions
  – CompletionTrans
  – EventTrans
  – CompareTrans
  – TimeOutTrans
  – VisualTargetTrans
Programming the Original Idea

- Most of the Nodes can use SoundNode
- Most of the transitions can use the TimeOutTrans, and CompletionTrans
- So what about the rest?
  - Sound detection should be possible using EventTrans
  - For the actions, it may be possible to either make a custom node, or link to a nested State Machine
Steps for Implementation

• Start with basic transitions and nodes then add more advanced versions
  – Replace recognizing claps with touching head button, which is supplied in the Tekkotsu tutorials
  – Replace complicated nodes with preset nodes, such as TailWagNode or LedNode

• Begin with a few nodes before more complicated models
REVAMPED PLAN

• Next 6 weeks:
  – Continue working on Kinematics (Jimmy)
  – Human-AIBO interaction (Erin)
  – Continue working on Image and sound recognition (Manoj)