LILI Interactive Storyteller

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Outline

• Background on the LILI Robot
• Our story architecture
• Implemented stories
• New features on LILI
• Future work
LILI Robot

• Lehigh Instrument for Learning Interaction
• LILI was created because children with autism tend to have difficulty interacting in social situations
• Low-cost option to be deployed in the home
Current Capabilities

• Interacts using voice commands and gestures
  • Follow me
  • Move left/right
  • Turn around

• Recognizes different users

• Uses an animated talking avatar
Our Goal

• Adding **interactive storytelling** function

• Increase **engagement** in a fun way
• Emulate a **social situation** to train a child how to respond to such a situation
Our Story Architecture

- Create a structure that allows many stories to be created, instead of a hard-coded story
- Our architecture is based on a graph data structure
  - Consists of nodes, activities, players
Nodes

• Attributes of a node:
  • Name
  • Description
  • Pre-conditions
  • Children

• Nodes can be bi-directional
Activities

• Defines the interaction
• Determines how the next node is chosen
Player

• Holds information about the current state of the story
• Which nodes have been visited
• Current location
• Pre-conditions required throughout the story
• Allows for easy access to this information
Putting it All Together

• Create the storyline by assigning parent/child relationships between the nodes
• Designate pre-conditions
• Attach an activity to each node
Implemented Story Types

• Instead of the traditional story, we implemented stories that model typical social situations children might encounter
  • Going to a movie theatre
  • Visiting a zoo
  • Conversation about pets
Movie

• Each dot represents a node
• Arrows represent relationships
Conversation

• Turn-taking and interaction practice
• Structure flexible enough for conversation
• User input interpreted and information extracted
• Knowledge of animals personalizes the conversation
Do you have any pets?

What kind of pet is it?

What is your pet’s name?

The End
Demo
Avatar

• Implemented a new avatar for improved text-to-speech
• Consists of two gifs to animate talking and idle sequences
Speech Recognition

• Use Google’s speech recognition engine
• Utilize NLTK, a natural language processor, to handle more general statements

Steps:
• Find root of every word in the user input
• Find root of the keyword(s) we are looking for
• Look for the keyword(s) in the user input
Future Work

• More intelligence
• Increased knowledge base
• More responsive to the user
• Gesture recognition
• More realistic avatar
Summary

• We successfully implemented an interactive storytelling feature
  • Using text-to-speech and speech recognition to interact between user and computer
• New, complex stories can be easily created
  • Versatile use
Questions?
Our Story Architecture

Implemented Story Types

Avatar