Class Today

- More types of events
  - Model manipulation
  - `pointOfViewChanged`
- Guarding events
- Counters

Setup for Lecture today

- Put in the objects:
  - Biped: Panda, whiteRabbit
  - Automobile: Hatchback, Sportscar
  - Shapes/Text: TextModel – name it counter

Event: `DefaultModelManipulation`

- Allows you to click on any object and move it
  - Click on it and drag it
  - Click with Shift key – move up and down
  - Click with Control (or CTRL) – turn an object
Try it! – objects moved and turned

Event: pointOfViewChanged
• Pick a character and events can happen based on this character's location changed

Event: PointOfViewChanged (cont)
• I picked Panda

Whenever panda close to whiteRabbit
• Whenever the panda is close to the white rabbit, the white rabbit should tell him
• The event is with respect to the panda

• Move whiteRabbit? Move Panda?
Event Corresponds to Panda

- When you move the whiteRabbit close to Panda, nothing happens
- When you move the Panda close to the whiteRabbit, something does happen!

Counter

- Want the Panda to count the cars by getting close to each car
- We need a 3D text to display the count. This is a 3D text showing a “String” as a 3D model. Note you cannot add a number to a string.
- We will also need a number property to add to and then redisplay the new number

Create the 3D text counter

- 3D text counter – its an object
  - Has a text field
  - set it to “0”
- Note cannot add a number to a string
- “0” + 1 doesn’t compute!

Need to add a Number property to the 3D counter

- Under textModel add a property
  - Make it darker, I painted it Blue
Under textmodel add 2 procedures

- setupCounter
  - What things do we need to do?

- updateCounter
  - What things do we need to do to update the counter?

Interactive Story: Counting Cars

- Want the Panda to first come close to the whiteRabbit who will tell him to count the cars by touching them. At this point we show the counter
- The panda visits the cars and counts the two cars.
- Then the panda visits the whiteRabbit and this time he says “well done”

First update eventListener

- Have rabbit tell panda to count and initialize the counter
Create new `pointOfViewChangeListener` for panda

- Count a car when the panda is close to it

![Code snippet](image)

Run your program

- Have the panda get close to `whiteRabbit`, more than once, what happens?
- Have the panda get close to the cars, what happens? How many cars are there?

We need to **guard the events** so they only happen once, or when we want them to

- We only want the rabbit to tell the panda once to count the cars!
- We only want to count a car once!
- We need to make something happen the first time both of these occur, and then check for that later….

Guard getting close to `whiteRabbit`

- First set the 3D text to “hello”, then change it the first time the panda is close to the `whiteRabbit`.
- Change it to “0” in `setupCounter`
Guard getting close to whiteRabbit

- Check to see if contents are hello
- Change it to “0” in setupCounter
- This event can only happen once!

Guard getting close to cars

- Change something the first time panda is close to them so you can check it.
- Change the opacity of the car by 10% or more – I decided to set to 0% so invisible

Guard for the whiteRabbit to just say “great job” once

- Add two conditions, now it can only happen once

This lecture covered

- Two new types of events:
  - ModelManipulation
  - pointOfViewChanged
- How to guard an event so it only happens once, or when you want it to
- Counter that displays its count