Herd of Sheep?

Group members

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Outline

- Overview of the game
- Tools
- An introduction to Herding
- Other sheep herding games
- The components that make up our game
- Look and feel

Game Overview

- To create a sheep dog simulator
  - Goal is to herd sheep into the pen or some other designate location
  - Sheep have a ‘mind of their own’
  - Dog is controlled either
    - in First Person (as though the player IS the dog)
    - zoomed out to Third Person
    - as an autonomous agent that learns the best way to herd sheep

Software Tools

- Ogre Libraries
- SDL
- 3D Studio max

Graphics

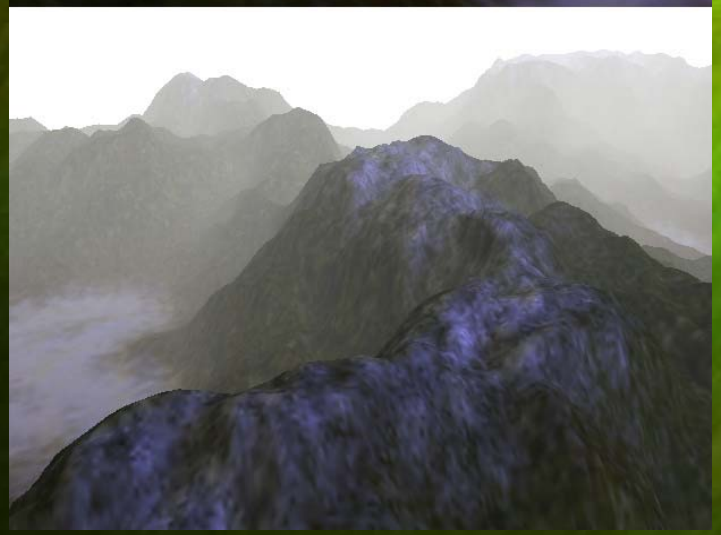
- Want 3d graphics with lighting, terrain, textures, sheep and dog models, fences, etc.
- Too much work in raw OpenGL - need existing 3d graphics engine
- Chose OGRE

OGRE

- OGRE: Object-Oriented Graphics Rendering Engine
- Free, open source, highly featured *graphics* engine
- Not a full game engine – still need sound, physics, AI, networking (?) etc.

OGRE Examples (1)

OGRE Examples (2)

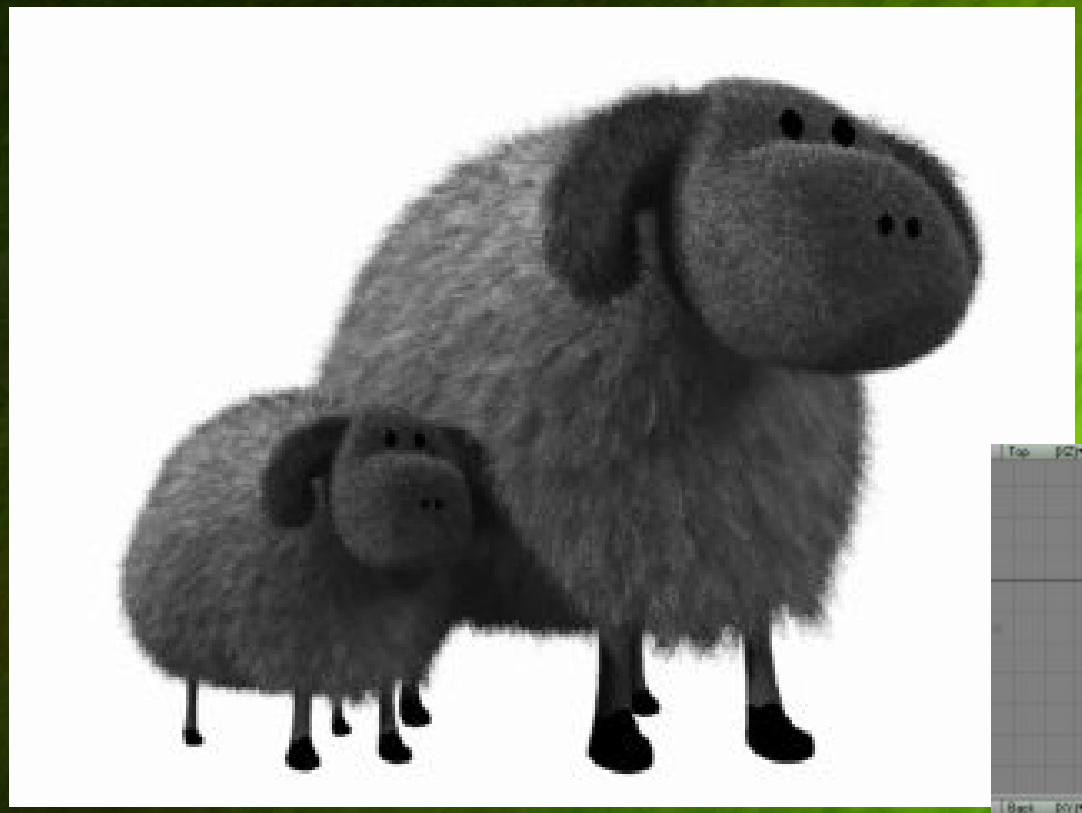


OGRE Examples (3)

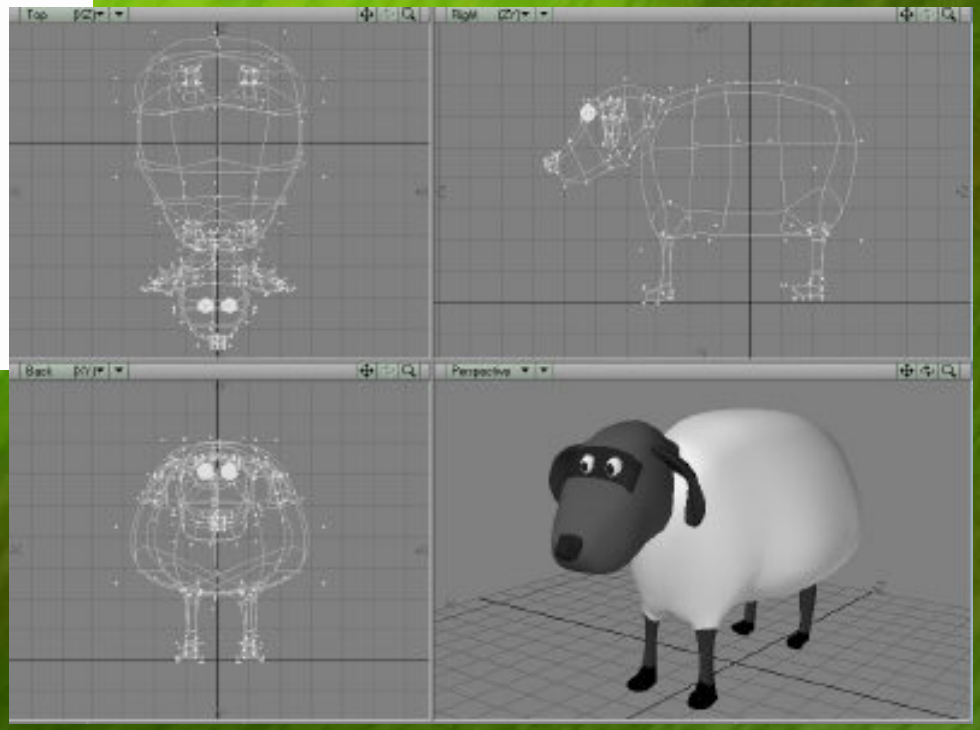
SDL

- Simple Direct Media Layer
- Cross Platform Multimedia Layer that provides low level access to
  - Audio
  - Keyboard
  - Mouse
  - Joystick
  - OpenGL
- Works on almost any platform; from OS X to Dreamcast

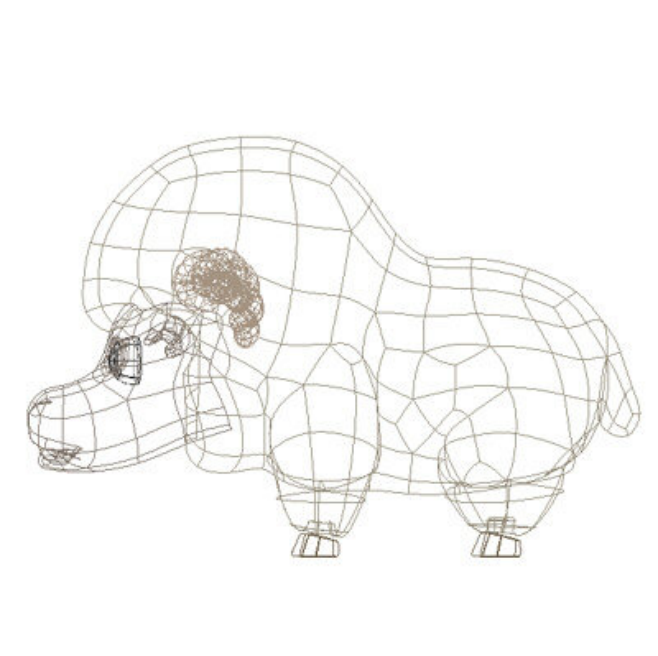
3DS max

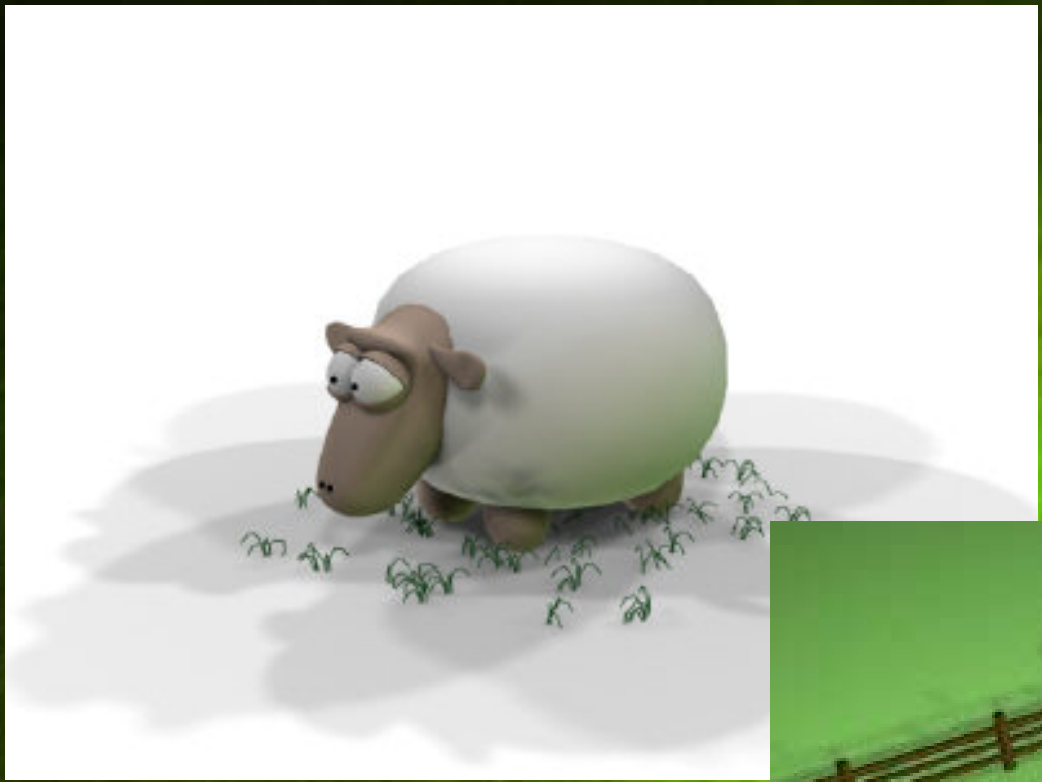


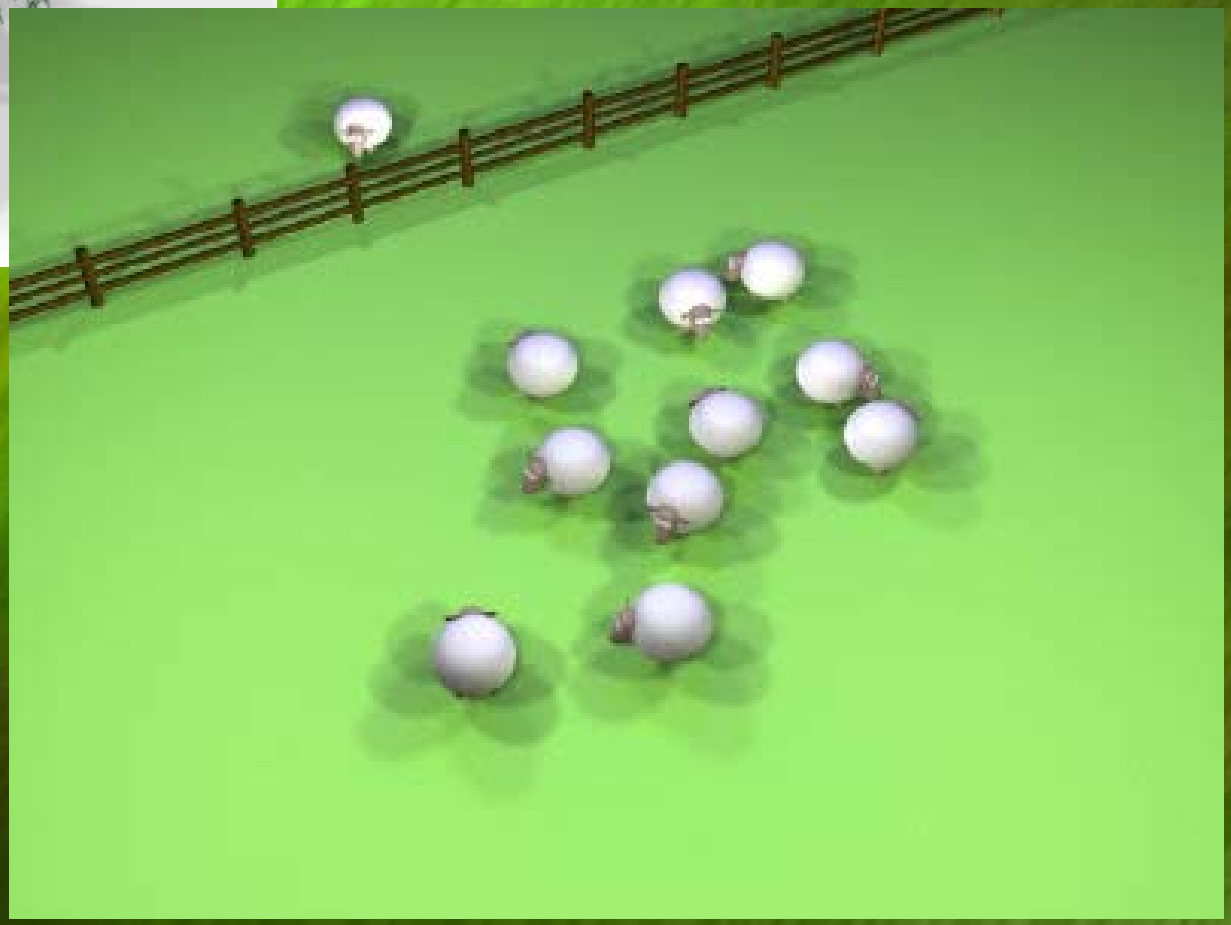
Examples of sheep

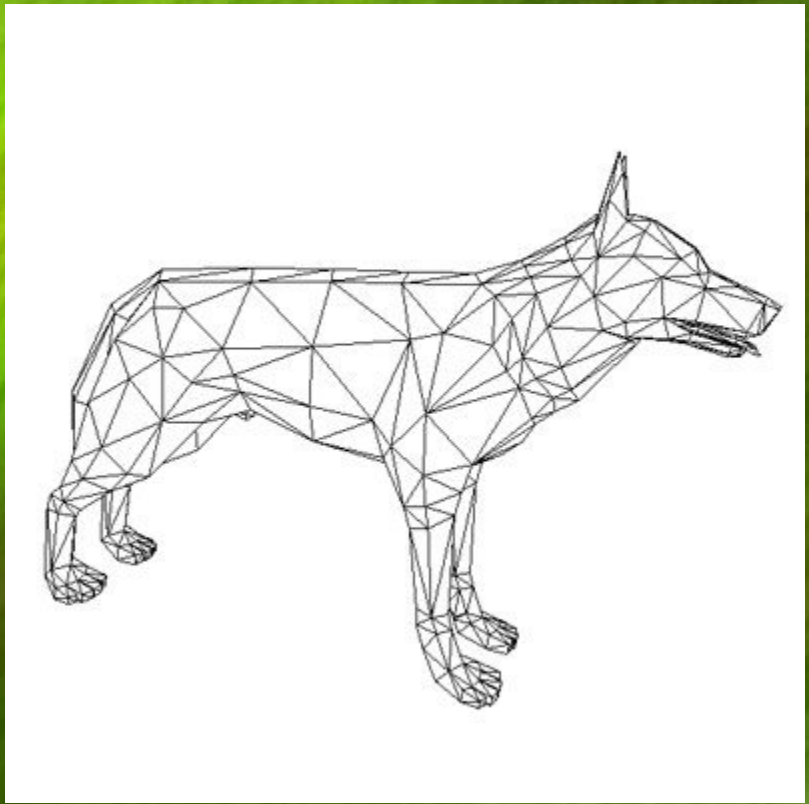



Sample Image







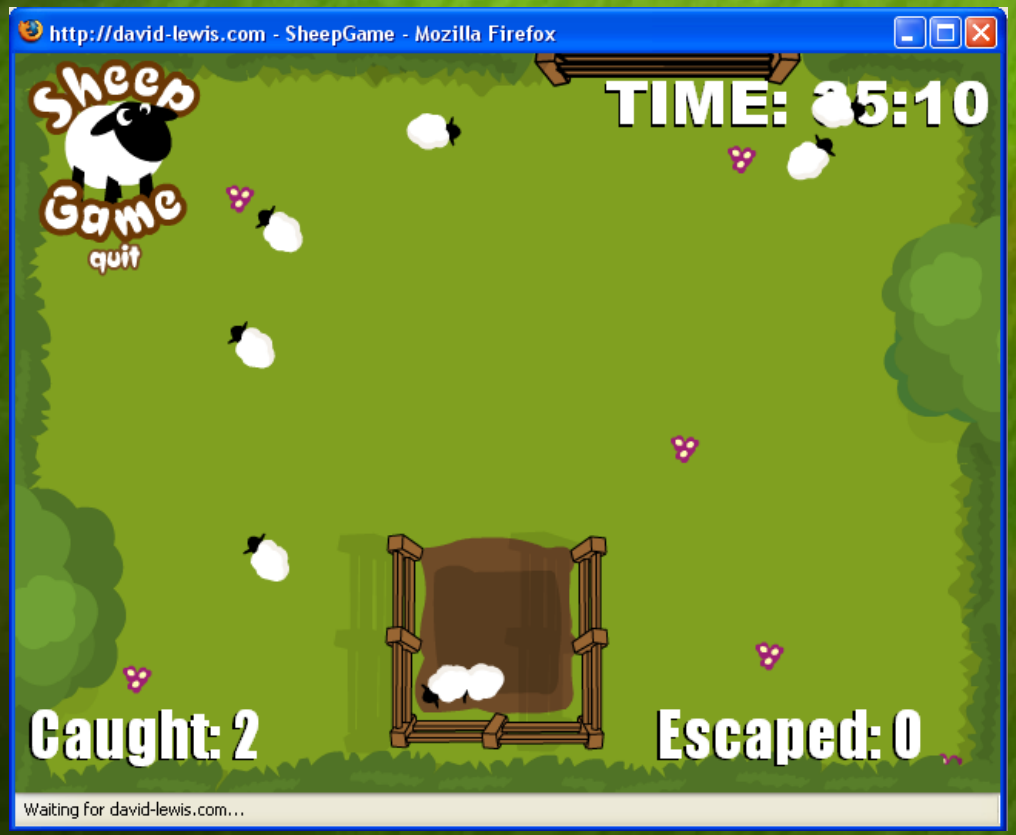


What is herding?

- Herding is an action by which a controlling object exerts forces upon multiple target objects in order to direct them to a particular location.

Existing Sheep Herding Games

- david-lewes.com
- Cursor pushes the sheep away



Existing Sheep herding Games (cont)

- www.thepcmanwebsite.com
- Sheep are attracted towards each other
- Dogs repulse the sheep
- Sheep naturally want to group together

Herding Sheep is ‘Serious’

- Simulates herding behaviour.
  - Herding is somewhat relevant to crowd, traffic and other particle effects.
- The characters of the game (minus the player character) are intelligent agents that make decisions based on their environment and their goals.

Game Play

- Level Based. Sheep get progressively more difficult to herd.
  - Use a genetic algorithm to make a new population of sheep that are less co-operative than the previous one.
  - Alternatively make the sheep dumber if the game gets too hard for the player
- Game could be:
  - ‘against the clock’.
  - against an AI opponent (another sheep dog)

Intelligent agents

- Can perceive the environment and be able to take actions that change the environment in order to reach a goal state
- Steps
  1. Interpret the world
  2. Determine an action that will advance the goal state
  3. Execute the action

Intelligent Agents (cont)

- Sheep have a desire to
  - flock (stay close together)
  - avoid collisions
  - Match speed with their flockmates
  - If the flock is moving, then align their velocities
- Sheepdog has a desire to
  - Direct the sheep towards the desired destination (pen)

Intelligent Agents (cont)

- A competing Sheepdog would ideally be able to learn from experience.
  - Update its beliefs when the sheep don't act as expected
- For randomness, the AI characters (sheep and dog(s)) have attributes that affect their beliefs and desires, and their ability to execute actions
  - Speed
  - Acceleration
  - Fear (of dog)
  - Herd Mentality (desire to stay with flock)
  - independence (wandering away from flock)

Herding by Force

- Attractive forces between sheep (or centre of flock)
- Dog influences velocity of flock by exerting a repulsive force against it, either by movement or barking
- Obstacles also exert repulsive forces
- Repulsive forces have the potential to split the flock.

Look and Feel

- Semi cartoon feel
- Makes the simulation feel more like a game
- Target audience will be youngsters
  - Probably more appreciative of a fun cartoon style as opposed to a 'real-world' simulation

By the way we know it’s a *flock* of sheep, not a *herd*