nuWar: A prototype sketch-based strategy game

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Paper Specifics

- nuWar: A prototype sketch-based strategy game
- Published in 2005
- For the American Association for Artificial Intelligence
About the Authors

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The Qualitative Reasoning Group conducts research on:
- Qualitative representations and reasoning, for capturing both everyday reasoning and expert reasoning about quantities, space, time, and causality.
- Sketch understanding, to create systems that can participate in sketching with people, and to model how visual, spatial, and conceptual processing combine to understand sketches.
- Analogical reasoning and learning, for being able to reason with, and learn from, examples and stories.
- Learning by reading, to discover how systems can extend their knowledge by understanding text and diagrams.
- How our progress in AI and cognitive science can be used to create new kinds of systems for education, performance support, and interactive entertainment.
Problem Statement

- Today's military strategy games using the usual point and click mouse interface with menus to control units.
- Today's military commanders use a sketch based interface to determine battlefield tactics.
- Game AIs are built on top of specifics of game interface paradigm, meaning AIs that get developed for a particular game are only usable on that game.
- This paper tries to solve these problems simultaneously by using a game interface that mimics "real" sketch-based interfaces, and builds an AI engine that interfaces with...
nuSketch Battlespace

- Other students have already explained how this system works
- These authors started with this system as a basis for their interface, and built a game called nuWar on top of it
- This is the same group that created nuSketch Battlespace in 2003, so this is follow-on work using that system

nuWar Overview

- Two player game
  - Head-to-Head or Hotseat
  - Initial scenario
    - Drawn from Library of scenarios
    - Sketched by one of the players
  - Players analyze scenario, then sketch a plan of attack
Figure 1: The Blue-side player sketches orders for a direct frontal assault on the city of Dullsville.

Figure 2: The Red-side player describes an ambush by sketching a course of action.
High Level Architecture

- Once each player clicks the button that they are ready to proceed, the simulation runs
- The sketches are animated to show progress of troops

Figure 3: Architecture diagram illustrating the process used to generate code to create "flick of a turn movie.

Figure 4: The results of the turn illustrated in Figure 1 and Figure 2. The Red ambush successfully prevented Blue from seizing the city of Dullsville. Shaded areas represent regions that are not visible to Red.
Motivation

- NuWar is not designed to be a game
- Want to let military strategists play the game and build up libraries of strategies and tactics
- Realism more important than in a normal mass-market game

Sketching Advantage for Gameplay

- Spatial Reasoning is a large component of military strategy games
- “Sketching is a particularly good interface match for a war game because it simulates how real military commanders communicate plans, thus providing another source of immersion.”
- I take issue with this by the way
  - Real != Immersive in general
Sketching interface

- A traditional recognition interface works against immersion in a gaming environment
  - Training
  - Multi-Modal nature
  - Tightly adhered to a certain domain
- nuSketch provides “100% reliable, reasonably natural” alternatives
- I’m not buying it – I think this simplifies the problem greatly

Interface

- Glyphs
  - Normal interface modified
  - Glyph Bar breaks down possible entity entry by using submenus to break the list down into 3 dimensions
  - A template is stored for each possible dimension selection to limit the size of the glyph bar
Gestures

- Manual segmentation used instead of recognition
  - “Draw” button to start
  - Dynamically changes to “Finish” button to end

Types of Glyphs

- Location Glyphs
  - Units – position matters, not size
- Line Glyphs
  - Roads and Rivers – position and extent
- Region Glyphs
  - Location and Boundary
- Path Glyphs
  - Two strokes to indicate width
- Symbolic Glyphs
  - Task List – no positional significance
Leveraging Past Projects

- Cycorp’s Cyc Knowledge Base used for entity properties
- SHAKEN Action Description Language (SADL) used to guide units

Summary

- Not what I was expecting
  - I expected a game with a sketch interface
  - What I got was someone’s idea for a game with a sketch interface, where they hacked on an existing system (nSB) to a couple other legacy systems and called it a game.
- Since it’s a research project, it is only used internally, no external testing has been done, and product is not available
- Good “follow-on” work would be to actually make a game and test whether a sketch based interface is more natural by doing user testing on it