

nuWar: A prototype sketch-based strategy game

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November 26, 2007

Paper Specifics

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

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About the Authors

- **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

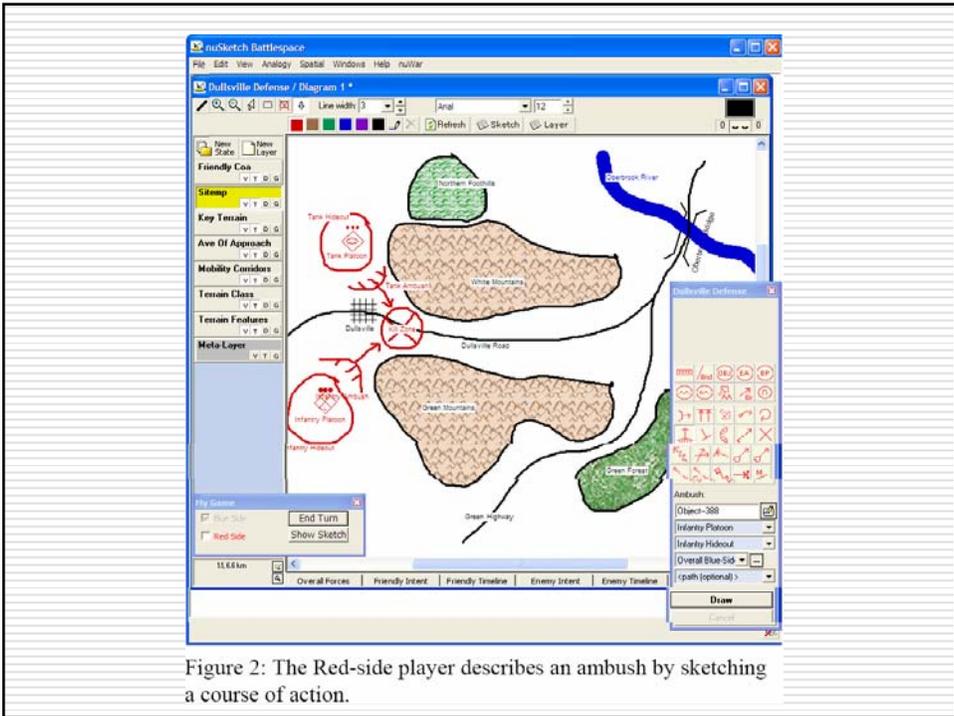
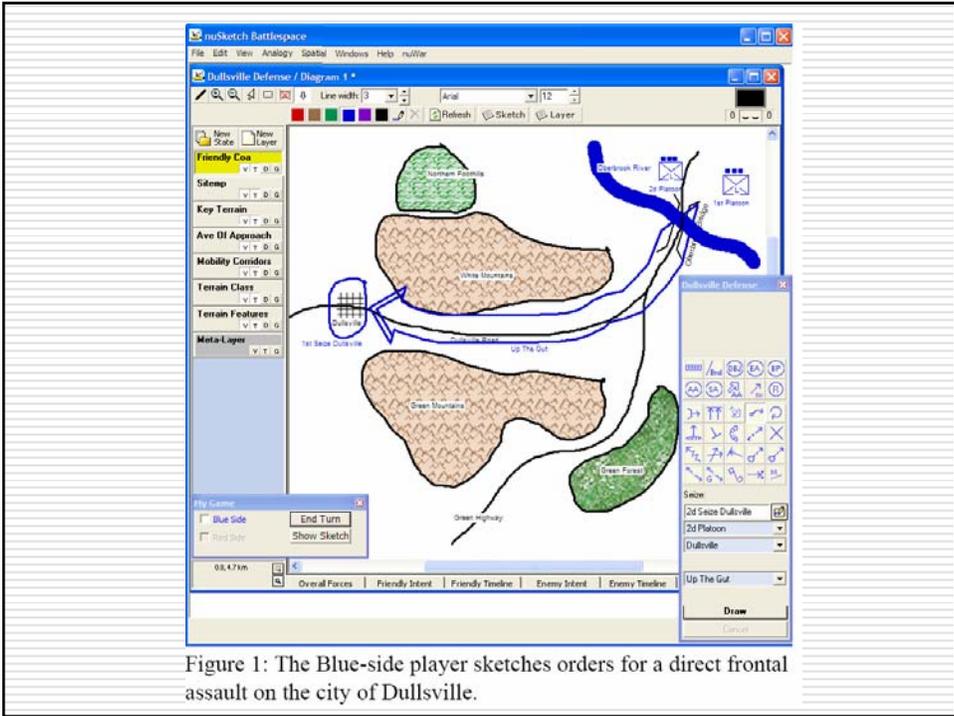


nuSketch Battlespace

- 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
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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
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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

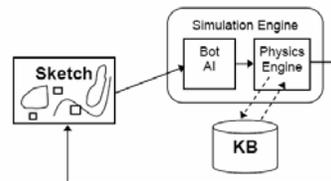


Figure 3: Architecture diagram illustrating the process used to generate each discrete "tick" of a turn movie.

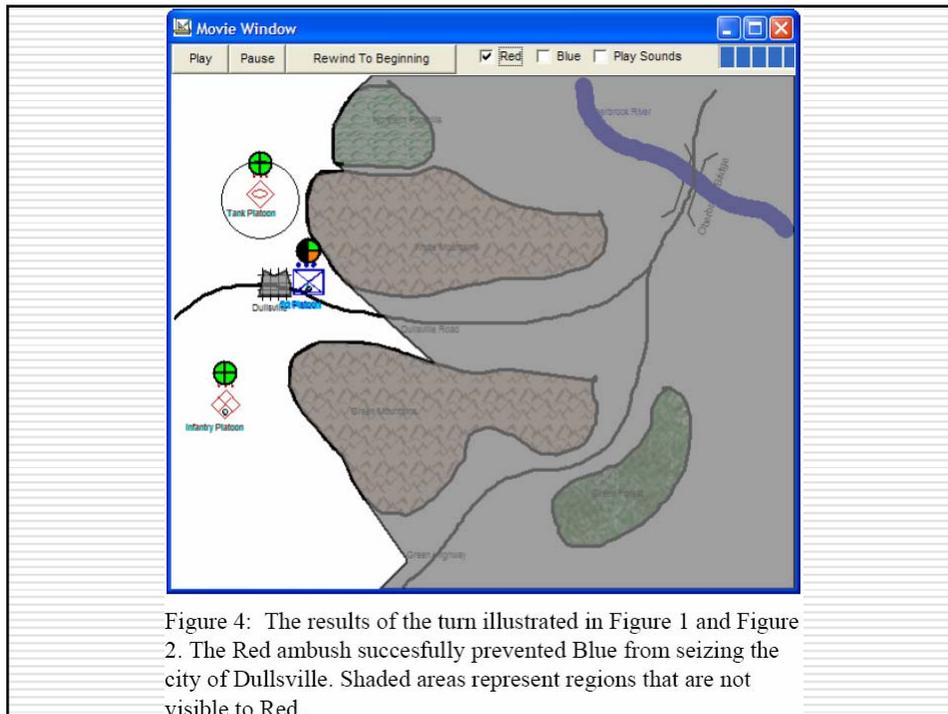


Figure 4: The results of the turn illustrated in Figure 1 and Figure 2. The Red ambush successfully prevented Blue from seizing the city of Dullsville. Shaded areas represent regions that are not visible to Red.

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
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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
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Sketching interface

- A traditional recognition interface work 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



Figure 5: Glyph bar

Gestures

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

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