

# **nuWar: A prototype sketch-based strategy game**

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November 26, 2007

## **Paper Specifics**

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- 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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  - Faculty
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  - Senior Software Engineer
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  - Grad Student



## 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

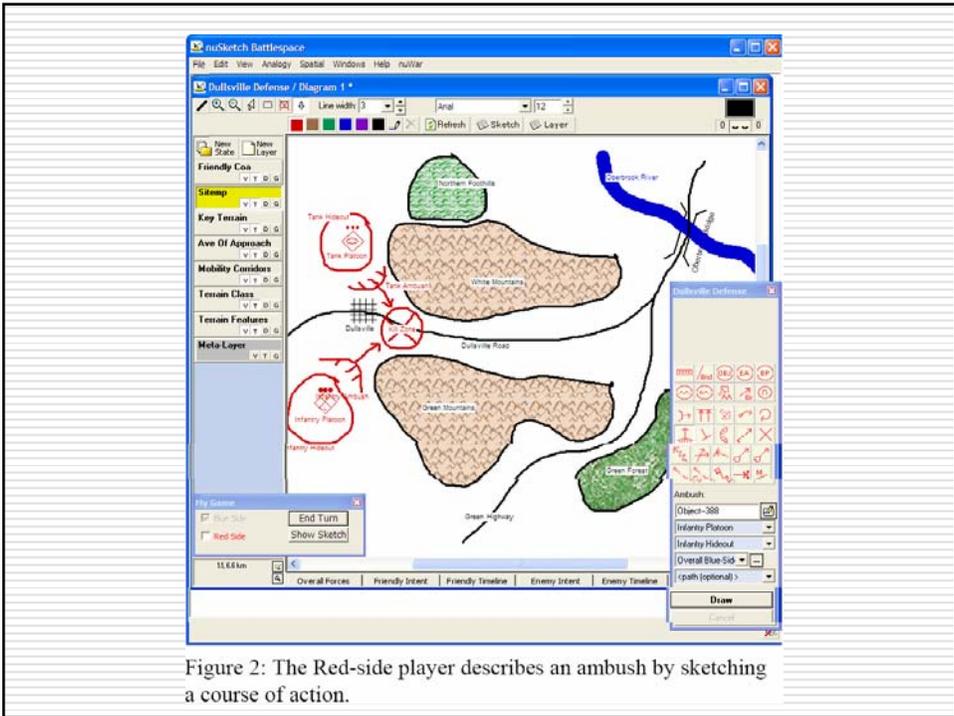
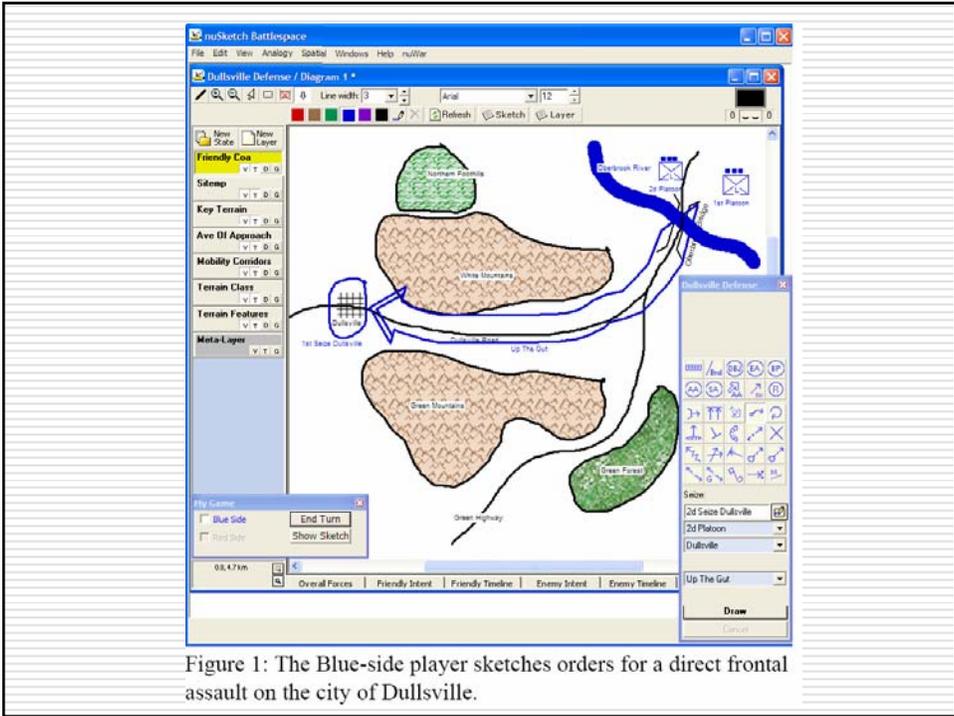
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- Other students have already explained how this system works
  - These authors started with this system as a basis for their interface, and built a game called nuWar on top of it
  - This is the same group that created nuSketch Battlespace in 2003,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

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- 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

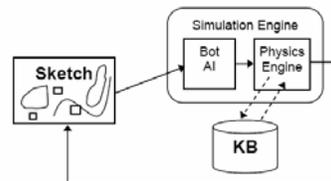


Figure 3: Architecture diagram illustrating the process used to generate each discrete "tick" of a turn movie.

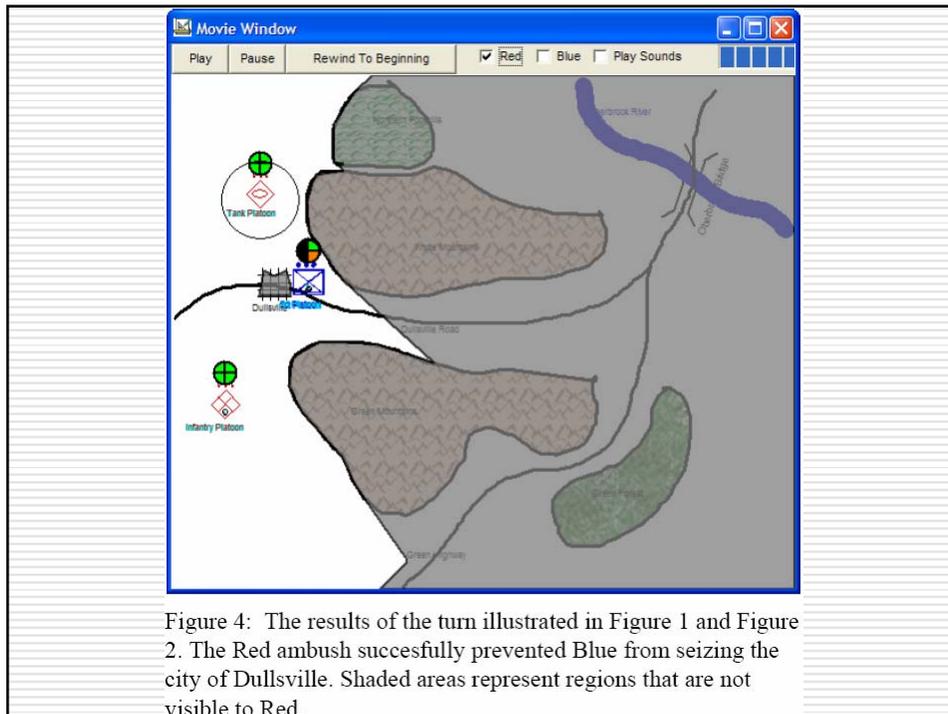


Figure 4: The results of the turn illustrated in Figure 1 and Figure 2. The Red ambush successfully prevented Blue from seizing the city of Dullsville. Shaded areas represent regions that are not visible to Red.

## Motivation

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- ❑ 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

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- ❑ 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

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

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- 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

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

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- ❑ 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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