Background

- Developed by the University of Washington's Center for Game Science in conjunction with David Baker’s lab
- 2005: Rosetta@Home
- Reinvented as Foldit
  - Protein folding puzzle game
  - Public Beta version first released May 2008
  - 240,000 registered players
  - Online through a software for Windows, Mac, and Linux OS
Basic Gameplay

- Fold and twist a linear sequence of amino acids into a three-dimensional configuration
- Goal: to create the protein’s three-dimensional configuration with the highest score
- A higher score represents a protein with more favorable energetic interactions between amino acids and the surroundings
- Meaningful because no efficient algorithm has been developed to guess these natural protein configurations
- Humans are good at pattern recognition
Unfolded Streptococcal Protein Puzzle
Almost folded
Folded Protein
Protein folding as a puzzle

- Complex, relevant, and there will never be a shortage of puzzles
- Users can develop their own strategies and “train” to become better at solving the puzzles
  - Though no perfect strategy
- Knowing that you can never “win” it may discourage some players from even really starting
Intuitive Mechanisms

Toolbox model:
- Click and Drag
- Rubber Bands
- Wiggle & Shake
- Freeze
- Mutate sidechains
- Create “recipes”
A Cohesive System

- Colorful bright aesthetics
  - Uncluttered, simple
  - Also serve a purpose for gameplay

- Many forms of immediate feedback (has pros & cons)
  - Colors
  - Points
  - Sounds
Social Play

- Foldit game design supports a community
- Chatroom
- Wikis
- Forums
- Solve problems as soloists or groups
- Leaderboard
- Encourages collaboration & competition
Negative criticism

- Still a moderate sized learning curve, overwhelming
- Cannot skip tutorial levels
- Does the gamification really make it an entertaining game?
- No way to build proteins completely from scratch
Accomplishments

Foldit Gamers Solve Riddle of HIV Enzyme within 3 Weeks

When video gamers armed with the world’s most powerful supercomputers take on science and its most vexing riddles, who wins? Sometimes, it’s the gamers.

Another Success for Foldit: Gamers Increase Enzyme Activity by a Factor of 18

Players of the online protein folding game Foldit have reached another milestone, creating an 18-fold-more-active version of a model enzyme. The gamers worked on an enzyme that catalyses the Diels-Alder reaction, which is used in the synthesis of...
Walkthrough

https://www.youtube.com/watch?v=DvYFjo3vC-k
References


