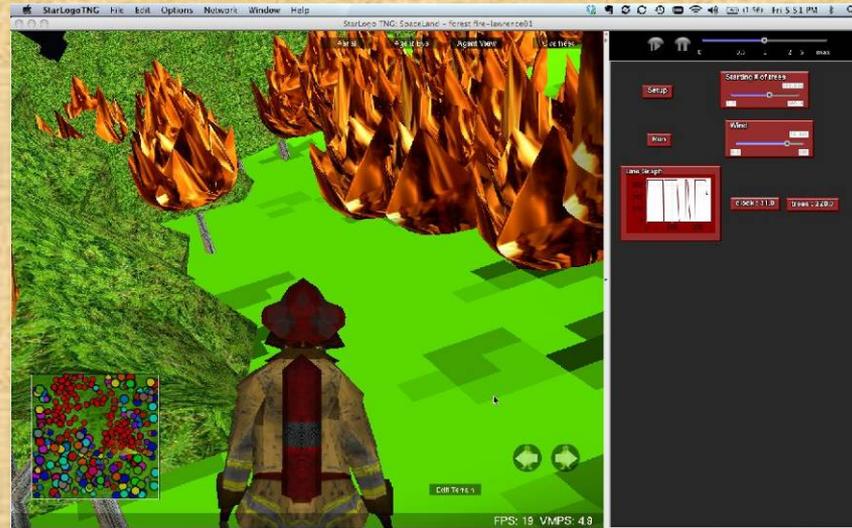


The Imagination Toolbox

Engaging students with relevant STEM topics through games and simulations



Daniel Wendel

Lead Developer, StarLogo TNG

Project Lead, Imagination Toolbox

MIT Scheller Teacher Education Program

Outline

- **Introduction & Philosophy**
- StarLogo TNG
- Imagination Toolbox's Beginnings
- Imagination Toolbox Today
- Imagination Toolbox Tomorrow

STEP - Getting kids to eat their vegetables since 1999



- Teacher training and development
- Educational technology research

- Prof. Eric Klopfer, Director
- Wendy Huang, Program Manager



Educational Technology Research (Games!)



Educational Technology Research (Games!)



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StarLogo TNG

Factory

Subsets My Blocks

Edit Breeds

Search blocks

Setup and Run

Movement

Logic

Controls

Terrain

Traits

Text

Math

Other Agents

Procedure

Variables

List

Colors

Shapes

Sounds

Blocks-based programming

clear all

setup

create Turtles

num 100

do

forward steps 5

forever

Turtles

pen down

forward steps 1

left degs 10

Turtle EverycSetup Runtir Collisi

Turtles

StarLogo TNG



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Imagination Toolbox's Beginnings

- Partnership between DHS S&T OUP and MIT STEP
- Goal: package DHS-relevant content for middle schoolers to promote STEM interest
- No black helicopters or terrorist hunts; needed activities that were appropriate for classrooms and fit with existing curricula
- Focused on two topics: Wildfires and Epidemics

Imagination Toolbox's Beginnings



Runtime Levels

0 0.5 1 2 5 max

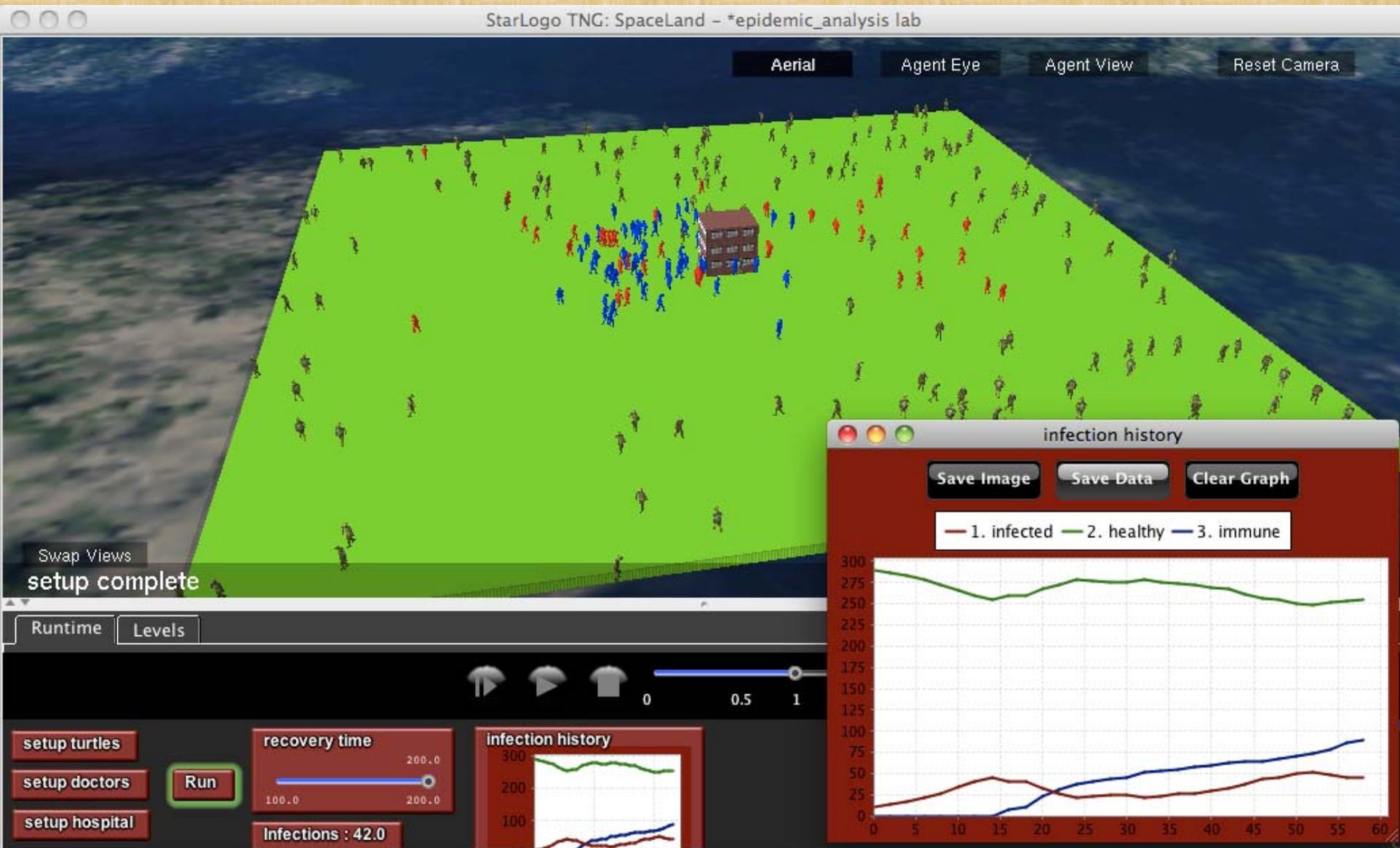
Level 1 Level 2

Required # of houses : 1.0 trees : 73.0 Get Score

setup Run

Required # of trees : 400.0

Imagination Toolbox's Beginnings



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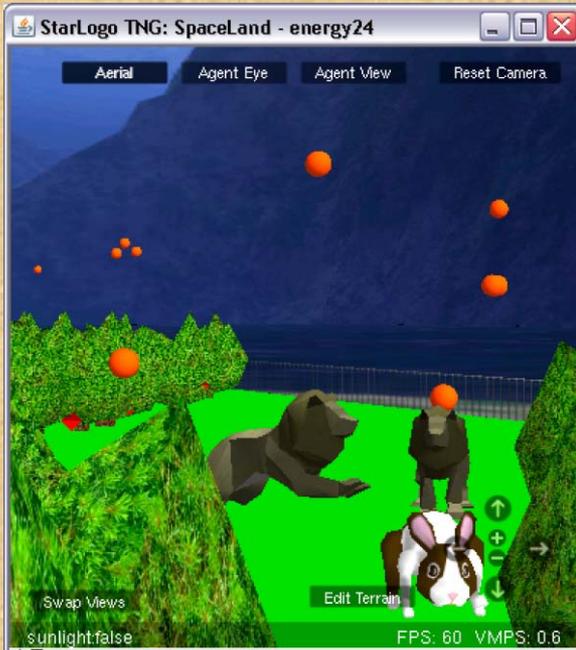
Imagination Toolbox Today

- After initial DHS grant, continued generous support from Linde Family Foundation
- Dozens of lessons and activities available, free of charge, to help teachers increase their students' interest and ability in STEM
- Active teacher training and support
- Currently planning training workshops for this summer

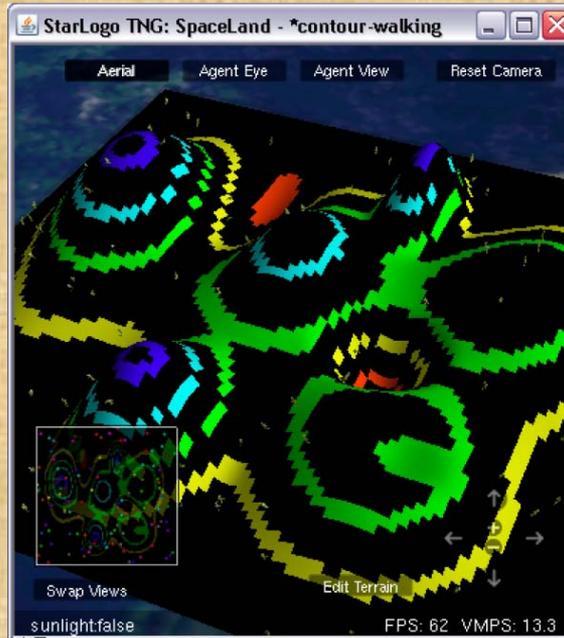
Imagination Toolbox Today



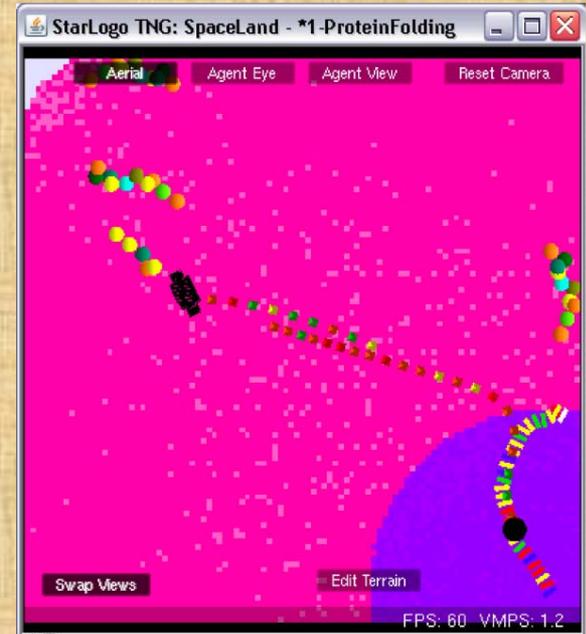
Imagination Toolbox Today



Energy flow in an ecosystem



Contour mapping



DNA -> RNA -> Protein

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- Imagination Toolbox Today
- **Imagination Toolbox Tomorrow**

Imagination Toolbox Tomorrow

- Moving away from staff-maintained website
- Currently creating an online community integrated into StarLogo TNG
 - A creative teacher can share activities that everyone will be able to use and benefit from
 - Students can track their progress on projects without worrying about where files were saved
- Focusing training efforts on IT staff and tech teachers who can become trainers themselves

Imagination Toolbox Tomorrow



For More Information

- Handouts
- Imagination Toolbox Website
 - <http://imaginationtoolbox.org>
 - <http://education.mit.edu/starlogo-tng>
- Daniel Wendel: djwendel@mit.edu
- Team email: imaginationtoolbox@mit.edu