Scripting vs *Emergence*

by Elias and Trygve

Overview

- Scripting vs Emergence
- Concerns for Devs
- Concerns for players
- Techniques

Scripting vs Emergence

Scripting:

- Bottom up
- Handcrafted and Rigid
- Focus on Narrow interactions

Emergence:

- Top down,
- Systemic design,
- Focus on Broad interactions.

The difference between the two

Scripting:

- Little uncertainty
- “Railroaded” / Linear Gameplay
- Direct Feedback, Clear Goal

Emergence:

- More uncertainty
- More freedom
- Less Feedback, Unclear Goal

Notes

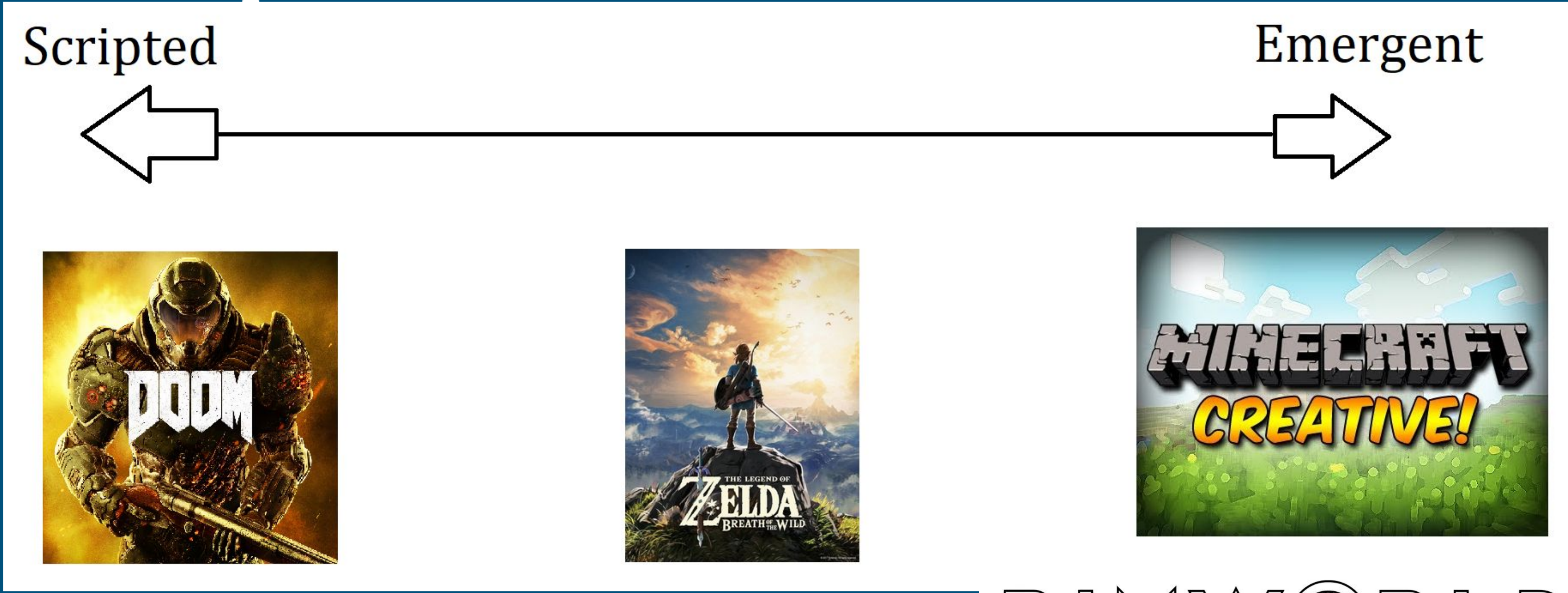
Two extremes on a spectrum

Most games fall in the middle

Paper stresses most games are scripted

Is a sandbox environment a game?

Examples



RIMWORLD

Point and click

Concerns for Devs

	Scripting	**Emergence**
Effort in initial design	Medium, easy to start, hard to maintain consistency	High, a lot of planning before coding starts
Effort in modifying	High, scales poorly and is difficult to modify	Low, scales well, easy to add and modify
Level of control	High control, devs decide permitted actions/outcomes	Low control, dev can't anticipate actions
Quality assurance / testing	Fewer outcomes means easier testing	High uncertainty, requires much testing
Ease of feedback / direction	Less feedback needed because the players path is predetermined	Player requires additional feedback / direction

Concerns for players

	Scripting	**Emergence**
Consistency and Immersion	Scripting often causes inconsistencies which easily ruins immersion	Consistent rules makes it easier to suspend disbelief, increasing immersion.
Intuitiveness and Learning	Inconsistencies in interaction often makes it harder to learn how the game works (eg. barrels)	Games that follow realistic rules are often more intuitive, and therefore easier to learn.
Player expression	Both actions and strategies are limited to the vision of the developer	Player can make their own choices and explore paths and strategies not anticipated by the developers. This can increase replayability.

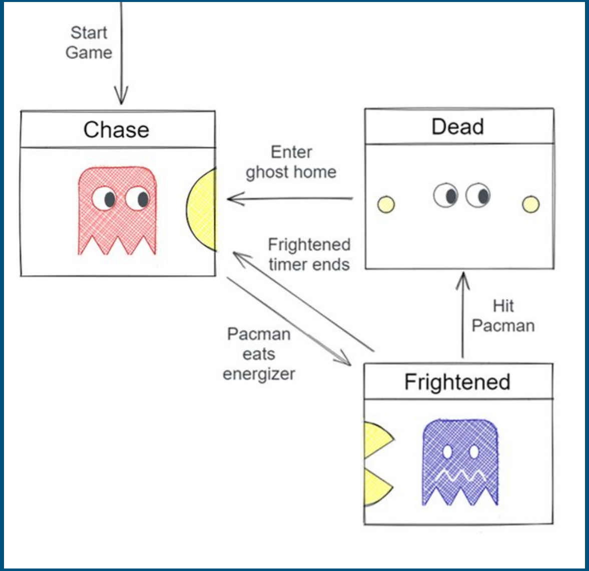
Techniques for Scripting

Finite State Machines (FSM)

Scripting Languages

Finite State Machines (FSM)

- Consists of a set of states, inputs, outputs and a state transition function
- Simple to create and understand
- Offers high power relative to their complexity
- Scales poorly as system gets more complex



Scripting languages

- High level programming language

- Allows communities to create mods

- Claim form the paper: Easier to use for non-programmers (not sure if we agree)

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ertions.push({result:!!e,message:t})
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),notDeepEqual:function(e,t,n){o(!
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):(m.blocking=!1,i())},stop:
setTimeout(function
jQuery&&(jQuery(
```

Techniques for Emergence

Flocking

Cellular Automata

Neural Networks

Evolutionary Algorithm

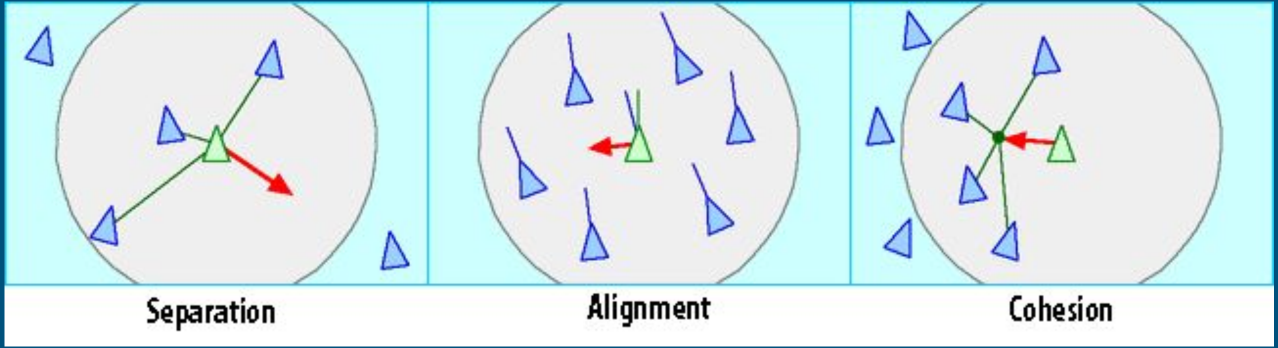
Flocking

Movement algorithm

Separation: Don’t crash

Alignment: Go to where my neighbours are going

Cohesion: Go towards the center of the flock

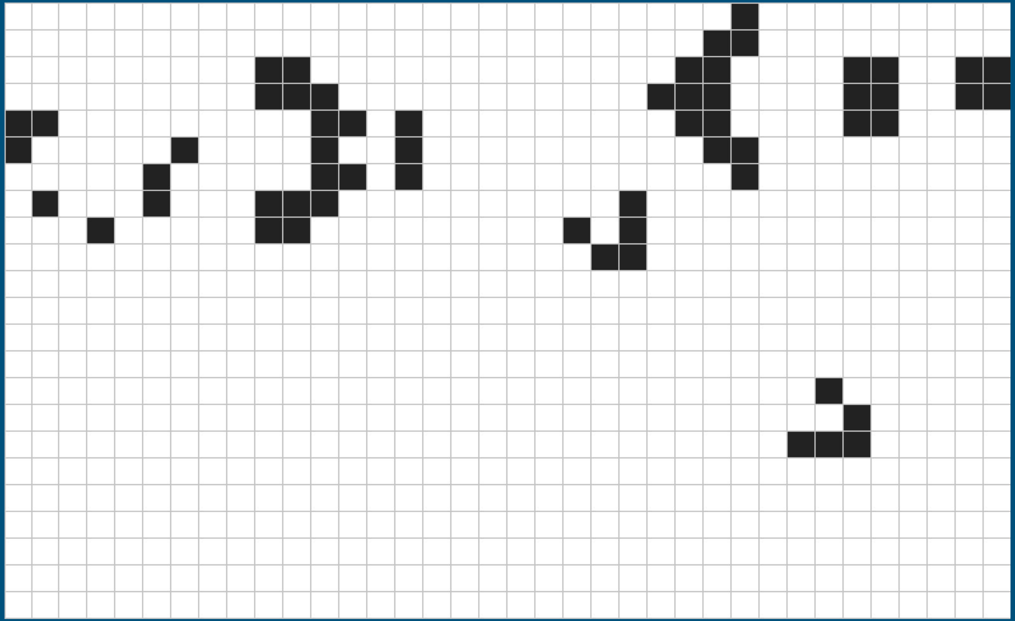


Cellular Automata

Each cell in a grid updates based on a set of rules

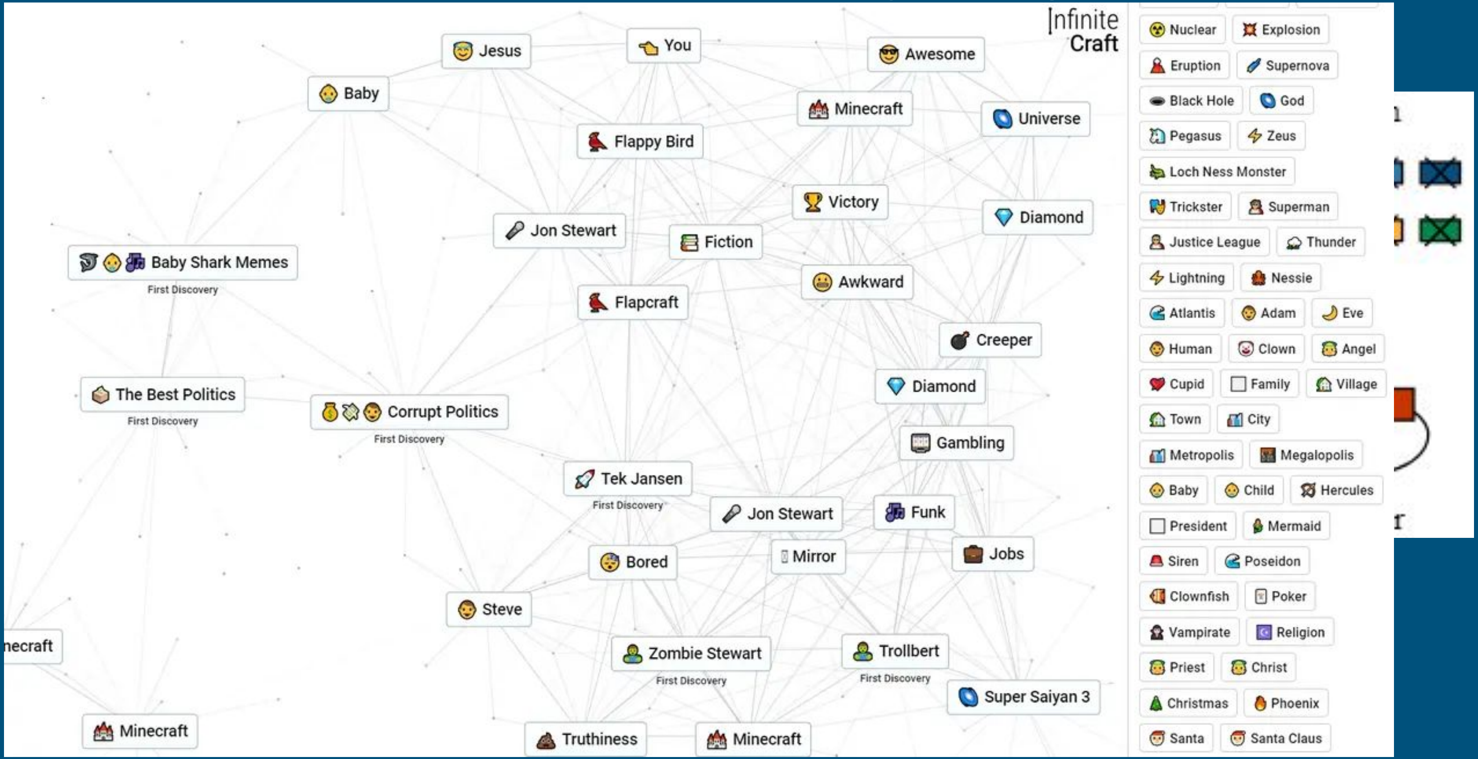
More realistic: Fire, Water or Smoke

Famously :
Conway's game of life



Neural Networks & Evolutionary Algorithms

Infinite craft


Infinite Craft
Jesus
You
Awesome
Baby
Minecraft
Universe
Flappy Bird
Victory
Diamond
Jon Stewart
Fiction
Baby Shark Memes
First Discovery
Awkward
Flapcraft
Creeper
Diamond
The Best Politics
First Discovery
Corrupt Politics
First Discovery
Gambling
Tek Jansen
First Discovery
Jon Stewart
Funk
Bored
Mirror
Jobs
Steve
Zombie Stewart
First Discovery
Trollbert
First Discovery
Super Saiyan 3
Minecraft
Truthiness
Minecraft
Nuclear
Explosion
Eruption
Supernova
Black Hole
God
Pegasus
Zeus
Loch Ness Monster
Trickster
Superman
Justice League
Thunder
Lightning
Nessie
Atlantis
Adam
Eve
Human
Clown
Angel
Cupid
Family
Village
Town
City
Metropolis
Megalopolis
Baby
Child
Hercules
President
Mermaid
Siren
Poseidon
Clownfish
Poker
Vampirate
Religion
Priest
Christ
Christmas
Phoenix
Santa
Santa Claus