Cognitively-grounded Procedural Content Generation

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AAAI2017 What’s Next for AI in Games Workshop
February 3rd, 2017
NO MAN'S SKY
“1.8 \times 10^{19} \text{ Planets}”
The effect is dizzying. But it wasn’t enough. After three years of hype, it took just a few hours for players to start complaining that the game was boring or was missing features they had seen in early trailers. Many asked for refunds. What went wrong?
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To answer why No Man's Sky fails, we can look at how it misses the target of human exceptionalism. The technology here is impressive, beautiful, and sometimes unforgettable. That tech's basic template, however, sets a level of expectations that maybe no game could ever deliver—and that this one certainly doesn't.
“We have seen the bankruptcy of that language” — Kate Compton
“We have seen the bankruptcy of that language” — Kate Compton

“I think the aesthetic of big numbers is dead” — Michael Cook
What is the problem?
What is the problem?
What is the solution?
Position:
the problem is a cognitive one
Position:
the problem is a *cognitive* one

- *Kaleidoscope Effect* —
  rapid comprehension of a system’s *expressive range*
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Position:
the solution requires *cognitive systems*
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- Systems that reify cognition relevant to the content being generated
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  - Procedural Narrative Generation
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  - Procedural Narrative Generation
    - Comprehension, Inferencing, Role-play, …
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- Systems that reify cognition relevant to the content being generated
  - Procedural Narrative Generation
    - Comprehension, Inferencing, Role-play, …
  - Procedural Terrain Generation
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- Systems that reify cognition relevant to the content being generated
  - Procedural Narrative Generation
    - Comprehension, Inferencing, Role-play, …
  - Procedural Terrain Generation
    - Psychophysics, Perception, Attention, …
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- AI that models *invariant relationships*
Position: the solution requires *cognitive systems*

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  - e.g. Newton’s Second Law, Fitts’ Law, Hick-Hyman Law
I am proposing to increasingly focus on identifying how a player’s internal makeup is affected by the generated content that is experienced, in order to understand the degree to which a content generator’s notion of meaning reconciles with a player’s. This is in service of what Simon (1996) might call a *science of (game) design*: a systematic characterization of invariant relationships between an inner environment (a player’s cognitive states), interface (game discourse), and outer environment (virtual worlds).

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