

# Cognitively-grounded Procedural Content Generation

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# NO MAN'S SKY

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A stylized illustration of a planet with a red and orange landscape. In the center, a person in a spacesuit stands looking out. To the right, a futuristic vehicle is parked. The scene is set against a backdrop of a large, glowing planet in the sky. The text "NO MAN'S SKY" is overlaid in the center.

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## NO MAN'S SKY

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.



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“I think the aesthetic of big numbers is dead” — Michael Cook



What is the problem?

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What is the solution?



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the problem is a *cognitive* one

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- *Kaleidoscope Effect* —  
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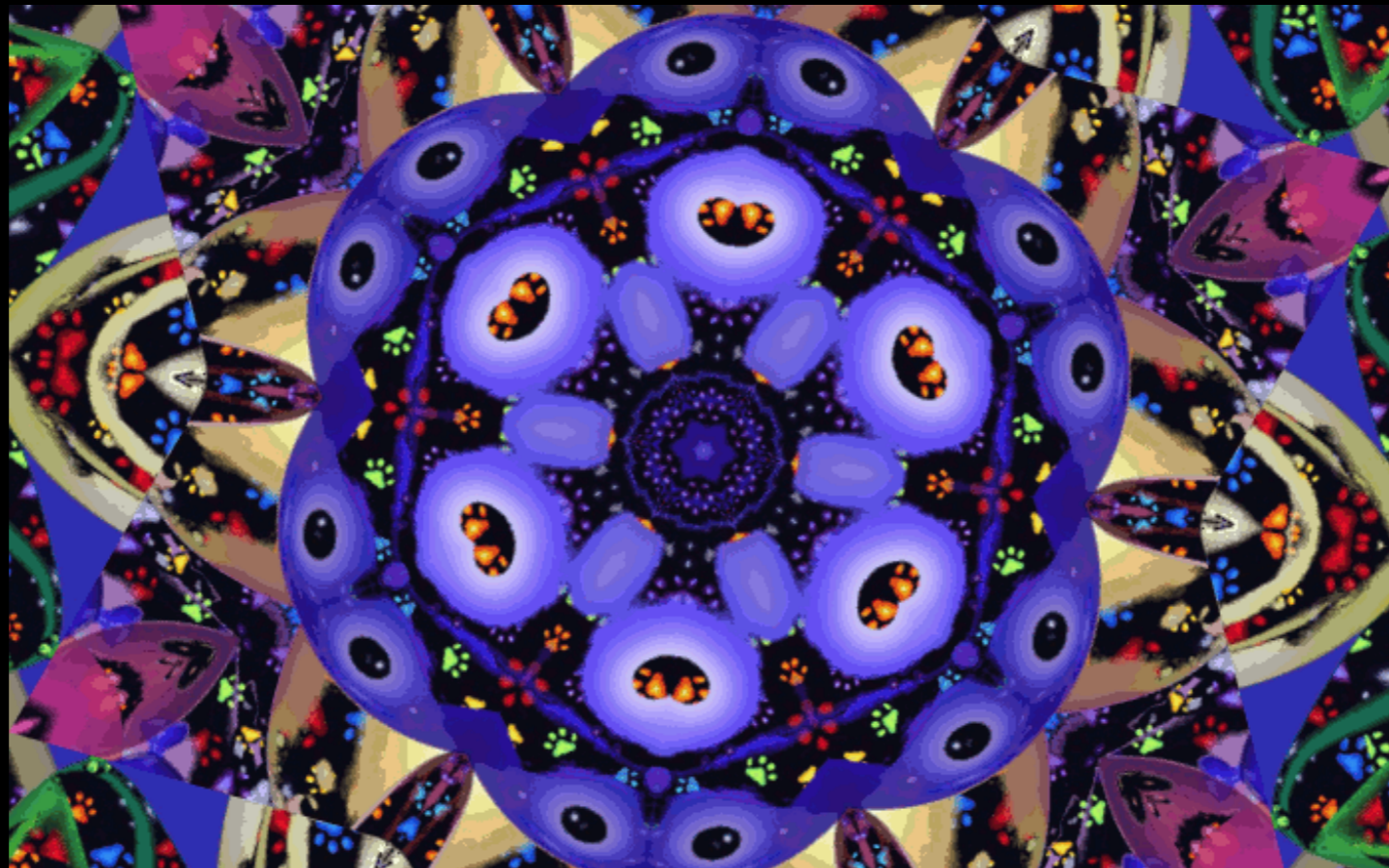
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    - Comprehension, Inferencing, Role-play, ...
  - ▶ Procedural Terrain Generation
    - Psychophysics, Perception, Attention, ...

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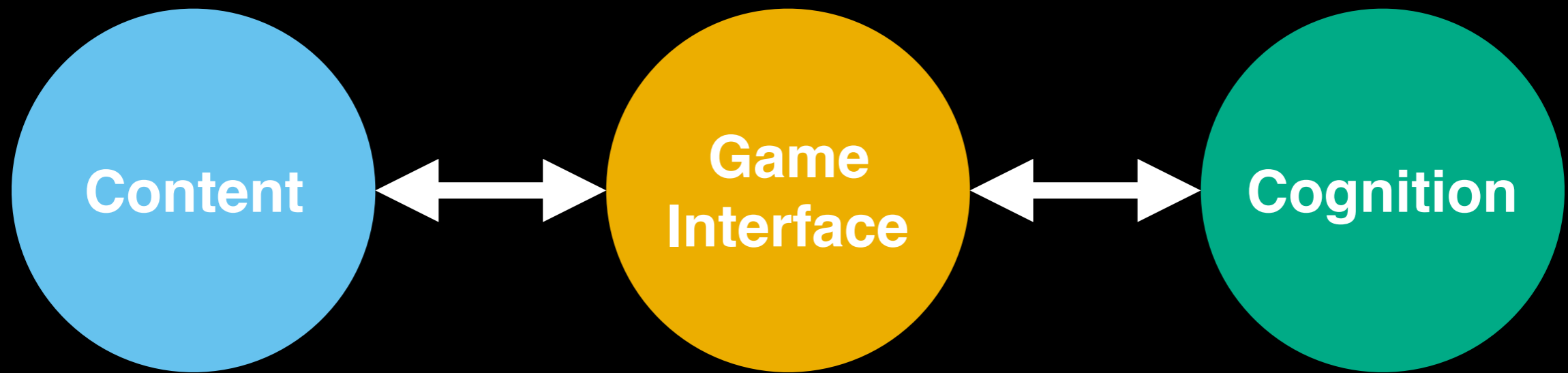
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Content

Game  
Interface

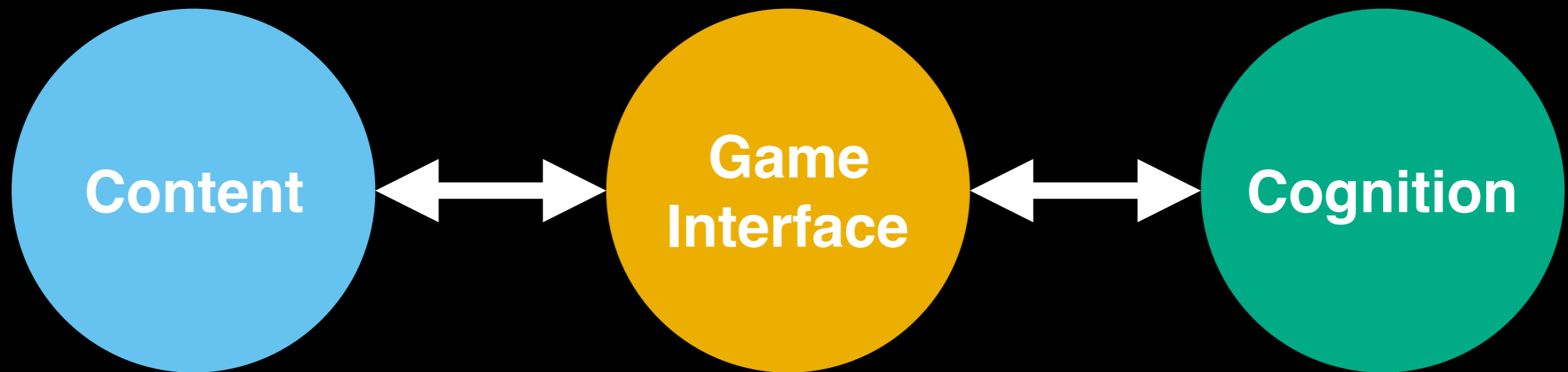
Cognition

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- AI that models *invariant relationships*
  - e.g. Newton's Second Law,  
Fitts' Law, Hick-Hyman Law

# Recap

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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