

Defensive Publication — Prior Art Disclosure

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Emotionally Coherent Procedural World Generation

Environmental Psychology as a Generative Framework

Abstract

This disclosure describes a method and system for procedurally generating three-dimensional virtual environments whose spatial composition, asset placement, and atmospheric properties are driven by parameters derived from empirical environmental psychology research. The core innovation is the use of multi-dimensional emotional profile vectors — parameterised from validated human perception studies including prospect-refuge theory, vastness-awe research, and spatial density psychology — as the primary control surface for an automated world generation pipeline.

Unlike prior approaches that use aesthetic heuristics, noise-based randomness, or manual artist direction, the system described here encodes psychological research findings directly as generative constraints. The result is environments in which emotional response is a designed output rather than an emergent side effect. This document constitutes a public prior art disclosure intended to prevent any third party from obtaining patent rights over the concepts and methods described herein.

1. Field of the Disclosure

This disclosure relates to procedural content generation (PCG) for real-time three-dimensional environments, and specifically to the application of environmental psychology theory as a computational framework for driving generative placement, terrain topology, atmospheric rendering, and scene composition. Applications include

but are not limited to: game development tooling, virtual reality environment generation, architectural visualisation, spatial design platforms, educational simulations, wellness and therapeutic virtual environments, and creative tooling for non-technical users.

2. Background

Procedural content generation for virtual environments has historically relied on two broad approaches: (a) noise-based terrain and placement systems that produce geographically plausible but emotionally neutral results, and (b) manual artist-directed workflows that achieve emotional resonance through skilled labour at high cost. Neither approach systematically encodes human emotional response as a generative objective.

A substantial body of empirical research in environmental psychology has established reliable, experimentally validated relationships between spatial properties and human emotional response — including prospect-refuge theory (Appleton, 1975), Kaplan and Kaplan's Attention Restoration Theory (1989), Russell's circumplex model of affect (1980), and work on vastness and awe (Keltner and Haidt, 2003). This body of research has not previously been applied as a primary generative constraint for automated 3D environment construction.

3. Disclosure of Concepts Placed into the Public Domain

The following concepts are hereby disclosed as prior art. Nothing in this disclosure is intended to restrict the independent development of any of these concepts by third parties. The purpose of this disclosure is exclusively to prevent exclusive patent rights from being granted to any party — including the publisher of this document.

3.1 Emotional Profile Vector as Primary Generative Control Surface

A multi-dimensional vector encoding psychological emotional parameters — derived from empirical environmental psychology research — used as the primary input to a procedural world generation pipeline. The vector encodes properties including but not limited to: prospect-refuge ratio, spatial density, vertical exposure, canopy density, water proximity, light character, and colour temperature. All downstream generation parameters are derived from this vector rather than being specified independently.

3.2 Physics-Simulation Terrain Generation Parameterised by Emotional Profile

Systems in which terrain topology is generated by a physics-based simulation whose governing parameters are derived from a multi-dimensional emotional profile vector grounded in environmental psychology research. The emotional profile determines the macro-topology character of the resulting terrain without prescribing specific geometric forms. The specific simulation method and its governing parameters are not disclosed herein.

3.3 Multi-Criteria Scored Evaluation for Procedural Asset Placement

Multi-criteria scored evaluation systems for procedural asset placement in which prospect-refuge theory (Appleton, 1975) is used as one factor within a multi-criteria scoring framework, and in which the target prospect-refuge ratio is determined by a psychological emotional profile parameter. Positions are evaluated for their visual exposure (prospect) and enclosure (refuge) characteristics, and assets are placed in positions whose scores match the emotional profile's target ratio.

3.4 Hero Spatial Anchor Points with Multi-Zone Emotional Influence Regions

Multi-zone emotional influence regions radiating from user-specified hero spatial anchor points, in which asset placement within each zone inherits an emotionally-blended profile interpolated between the local hero intent and the global scene emotional profile. The anchor point guarantees that the generated scene resolves spatially around the user-specified focal element.

3.5 Atmospheric Parameter Derivation from Emotional Profile Vectors

Atmospheric and rendering parameter derivation systems in which weather, lighting, fog density, colour palette, and particle properties are mapped from psychological emotional profile parameters using research-grounded rule systems. Atmospheric character is not selected from a discrete preset list but derived continuously from the emotional profile vector.

3.6 Platform-Agnostic Manifest Architecture with Emotional Metadata

Platform-agnostic manifest architectures for procedurally generated environments in which the same generation output — including emotional metadata — drives multiple rendering targets via adapter layers. The manifest preserves the emotional intent of the

generation independently of the target platform's rendering capabilities, allowing the same world to be instantiated across different platforms with appropriate fidelity tradeoffs.

3.7 Deterministic Seeded Generation with Emotional Profile as Co-Seed

Deterministic seeded procedural world generation systems in which a world seed combined with a psychological emotional profile vector uniquely and reproducibly determines the complete spatial composition of a generated environment — including terrain topology, asset placement, atmospheric parameters, and sightline design. The same (seed, emotional profile) pair always produces an identical output.

3.8 Server-Side Generation Architecture Protecting Emotional Scoring Implementation

Server-side generation architectures in which the emotional scoring and terrain generation pipeline executes remotely and client applications receive only a platform-agnostic output manifest, such that the implementation details of the emotional-to-spatial mapping — including scoring weights, parameter curves, and solver methods — are not derivable from client-side inspection of the output.

3.9 Walkability as a Mathematical Property of Emotionally-Parameterised Simulation

Terrain generation systems in which surface continuity and walkability are guaranteed as mathematical properties of an emotionally-parameterised physics-based simulation, rather than enforced by post-processing correction applied to independently generated geometry. The simulation's governing parameters are constrained such that the resulting geometry is provably traversable without requiring a separate walkability pass or navigation mesh correction step. The specific constraint mechanism is not disclosed herein.

4. Prior Art Context

The following prior works are acknowledged as relevant to this disclosure. None of the works below, individually or in combination, discloses or suggests the use of multi-dimensional emotional profile vectors derived from environmental psychology research as the primary control surface for a complete procedural world generation pipeline.

- Appleton, J. (1975). *The Experience of Landscape*. Wiley. (Prospect-refuge theory.)
- Kaplan, R. & Kaplan, S. (1989). *The Experience of Nature*. Cambridge University Press. (Attention Restoration Theory.)
- Russell, J.A. (1980). A circumplex model of affect. *Journal of Personality and Social Psychology*, 39(6), 1161–1178.
- Keltner, D. & Haidt, J. (2003). Approaching awe, a moral, spiritual, and aesthetic emotion. *Cognition and Emotion*, 17(2), 297–314.
- Shaker, N., Togelius, J. & Nelson, M.J. (2016). *Procedural Content Generation in Games*. Springer. (General PCG survey.)
- Perlin, K. (1985). An image synthesizer. *ACM SIGGRAPH Computer Graphics*, 19(3), 287–296. (Noise-based terrain generation.)

5. Scope of This Disclosure

Nothing in this disclosure is intended to restrict the independent development of any of the concepts described by third parties for their own use. The purpose is exclusively to place these concepts in the public domain as prior art.

The concepts disclosed are listed below. Each entry corresponds to one of the sections in §3 above:

- (1) Multi-dimensional emotional profile vectors derived from environmental psychology research used as the primary generative control surface for automated 3D world generation pipelines.
- (2) Systems in which terrain topology is generated by physics-based simulation whose parameters are derived from multi-dimensional emotional profile vectors grounded in environmental psychology research.
- (3) Multi-criteria scored evaluation systems for procedural asset placement in which prospect-refuge theory is used as one factor within a multi-criteria scoring framework, and in which the target prospect-refuge ratio is determined by a psychological emotional profile parameter.
- (4) Multi-zone emotional influence regions radiating from hero spatial anchor points, in which asset placement within each zone inherits an emotionally-blended profile interpolated between the local hero intent and the global scene emotional profile.

- (5) Atmospheric and rendering parameter derivation systems in which weather, lighting, fog, colour palette, and particle properties are mapped from psychological emotional profile parameters using research-grounded rule systems.
- (6) Platform-agnostic manifest architectures for procedurally generated environments in which the same generation output drives multiple rendering targets via adapter layers, with emotional metadata preserved in the manifest.
- (7) Deterministic seeded procedural world generation systems in which a world seed combined with a psychological emotional profile vector uniquely and reproducibly determines the complete spatial composition of a generated environment.
- (8) Server-side generation architectures in which the emotional scoring and terrain generation pipeline executes remotely and client applications receive only a platform-agnostic output manifest, such that implementation details are not derivable from client-side inspection.
- (9) Terrain generation systems in which surface continuity and walkability are guaranteed as mathematical properties of an emotionally-parameterised physics-based simulation, rather than enforced by post-processing correction applied to independently generated geometry.

6. Publication Statement

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convergence methods, scoring weight values, data structures, manifest schemas, and all other implementation specifics remain proprietary and are not disclosed herein.

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— *End of Prior Art Disclosure* —