



Procedural generation

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# What is Procedural Content Generation (PCG)?

- 攔 algorithmical creation of game content
- 攔 limited or indirect user input
- 攔 computer software that can create game content on its own
- 攔 key term here is “content”
- 攔 levels, maps, game rules, textures, stories, items, quests, music, weapons, vehicles, characters, etc
- 攔 another important term is “games”
- 攔 generated content must be playable

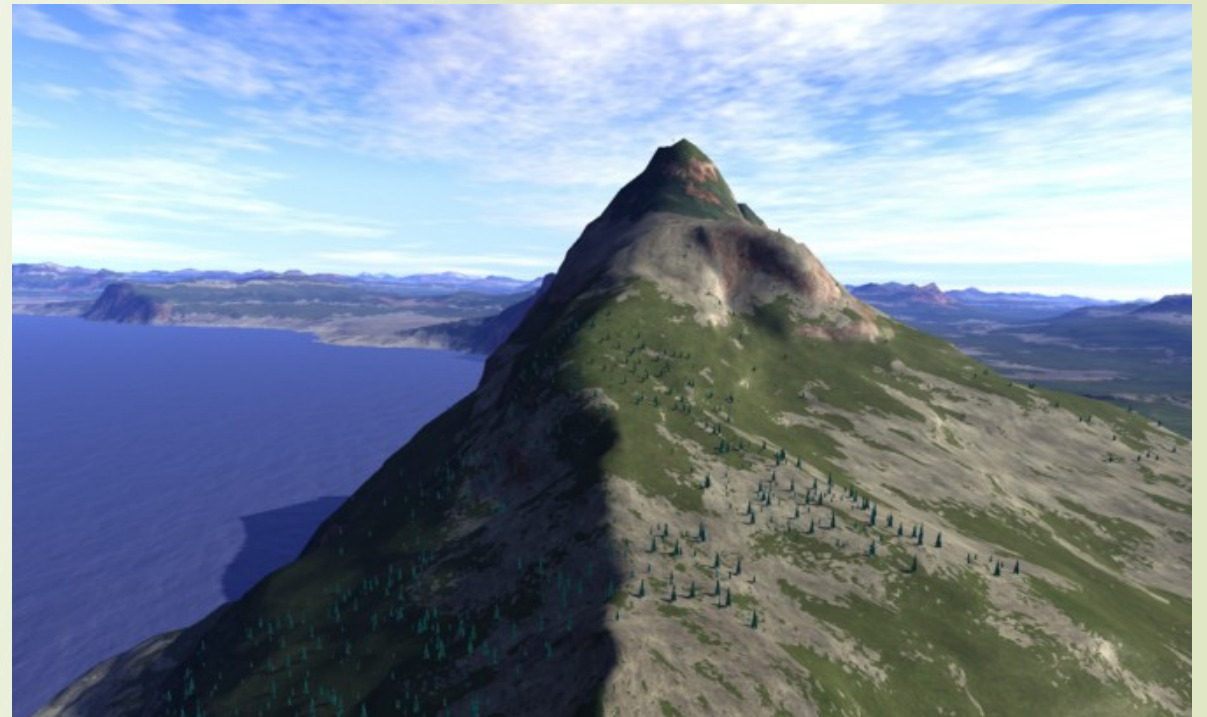


# Why use procedural content generation?

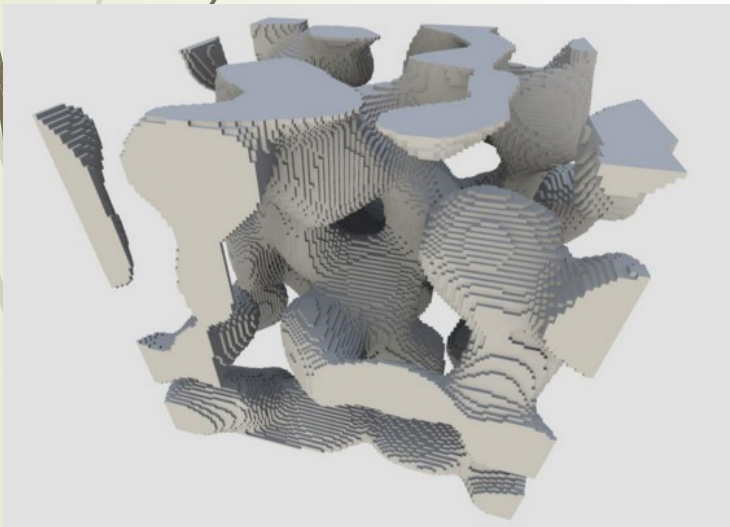
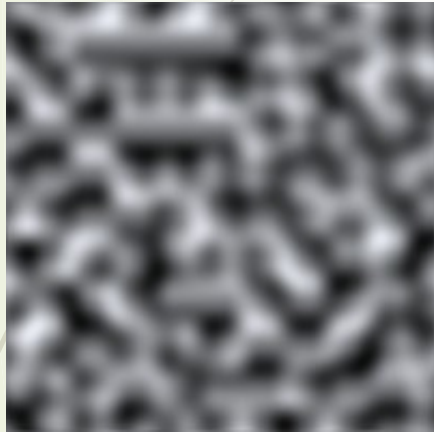
- 摺 removes the need for having a human designer or artist generate that content
- 摺 saves development time
- 摺 helps us be more creative
- 摺 storage limitations

# Map/terrain generation

- 攔 map requires values over a 2d or 3d grid
- 攔 forms the space that a player occupies and interacts with



# Perlin noise



- 攔 an extremely powerful algorithm
- 攔 used often in procedural content generation
- 攔 a type of gradient noise
- 攔 developed by Ken Perlin in 1983
- 攔 can be used for any sort of wave-like, undulating material or texture
- 攔 could be used for procedural terrain, fire effects, water, and clouds

# Cellular Automaton

a grid of cells, each "on" or "off"

off	off	on	off	on	on
on	off	off	off	on	on
on	off	on	on	on	off
off	off	on	off	on	on
on	on	off	off	on	off
on	on	on	off	off	on
on	off	off	on	on	on
off	off	on	off	on	off

a neighborhood  
of cells

- 擱 model of a system of "cell" objects
- 擱 each cell has a state
- 擱 each cell has a neighborhood
- 擱 used for dungeon generation
- 擱 create organic looking patterns