

Isometric Grammars

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Contents

1	Introduction	1
2	Transformation	1
3	Iteration 1	2
4	DONE Implement repeat function	3
5	DONE Bounds check be adding cuboid to grid	3
6	DONE Allow isize for positions	3
7	TODO Remove random cuboids from image	3
8	DONE Bounding box f list of cuboids	3
9	TODO bounded + randomly placed translate repeat	3

1 Introduction

This post extends the ideas presented in Isometric Snowflakes adding other transformations on cuboids.

To do so, transformations are combined in (randomly generated) groups, then used to generate cuboids to add to the image.

2 Transformation

- Swapping axes

- Mirroring along an axis

3 Iteration 1

```
language=Lisp,label= ,caption= ,captionpos=b,numbers=none (defun plt-
swap-random-both (obj) (plt-choice (plt-swap-xy-both obj) (plt-swap-xz-both
obj) (plt-swap-yz-both obj)))
```

```
(defun plt-mirror-random-both (obj) (plt-choice (plt-mirror-x-at-both obj
64) (plt-mirror-x-at-both obj 64) (plt-mirror-x-at-both obj 64)))
```

```
(defun plt-translate-repeat-random (obj) (let ((times (plt-random-in-range
2 10)) (step (plt-random-in-range 2 10))) (plt-choice (plt-translate-repeat-x
obj step times) (plt-translate-repeat-y obj step times) (plt-translate-repeat-z
obj step times))))
```

```
(defun plt-ig-random (obj) (plt-choice (plt-ig-random (plt-mirror-random-
both obj)) (plt-ig-random (plt-swap-random-both obj)) (plt-ig-random (plt-
swap-random-both obj)) (plt-ig-random (plt-swap-random-both obj)) (plt-
ig-random (plt-translate-repeat-random obj)) (plt-ig-random (plt-translate-
repeat-random obj)) (plt-ig-random (plt-translate-repeat-random obj)) obj
obj obj))
```

```
(let ((revision (format-time-string "(dotimes (i 100) (let* ((seed (plt-random-
seed)) (caption (vector (format "0x(randomseed) (let* ((grid-size 128) (n-
cuboids (plt-random-pow 214)) (grid (plt-make-grid grid-size))) (dotimes (n-
cuboids) (- >
(plt-random-iso-cuboid (plt-random-pow 2-size 06) grid-size) (plt-
ig-random) (plt-grid-add-grid))) (plt-grid-to-image-bw-grid (vector 32.032.0) (concatdir" /" revision
```

- 4 **DONE** Implement repeat function
- 5 **DONE** Bounds check be adding cuboid to grid
- 6 **DONE** Allow isize for positions
- 7 **TODO** Remove random cuboids from image
- 8 **DONE** Bounding box f list of cuboids
- 9 **TODO** bounded + randomly placed translate repeat

generate, bb, move to origin, translate repeat, randomly place