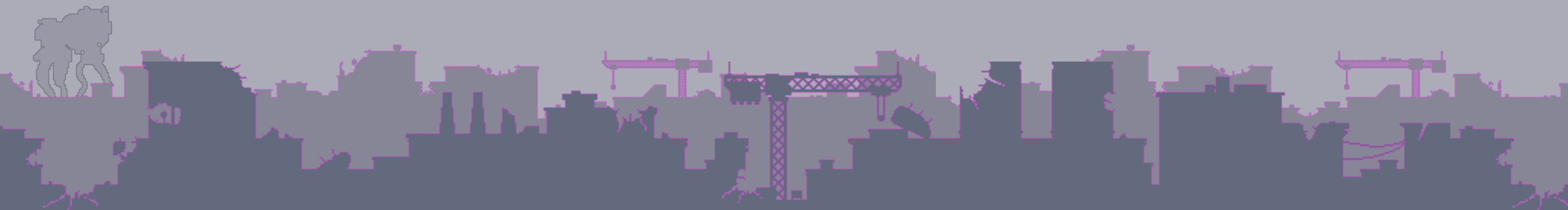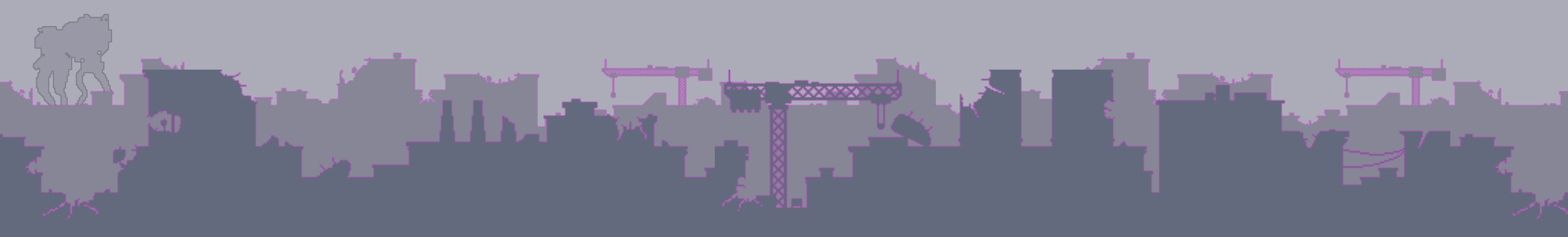# Falling to your Death:
The CANABALT Postmortem

Eric Johnson
Adam 'Atomic' Saltsman
Semi Secret Software
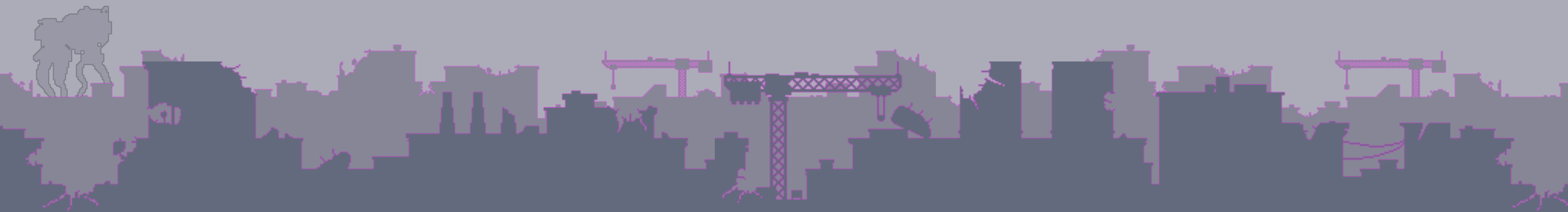
Canabalt

- ▶ adamatomic.com/canabalt

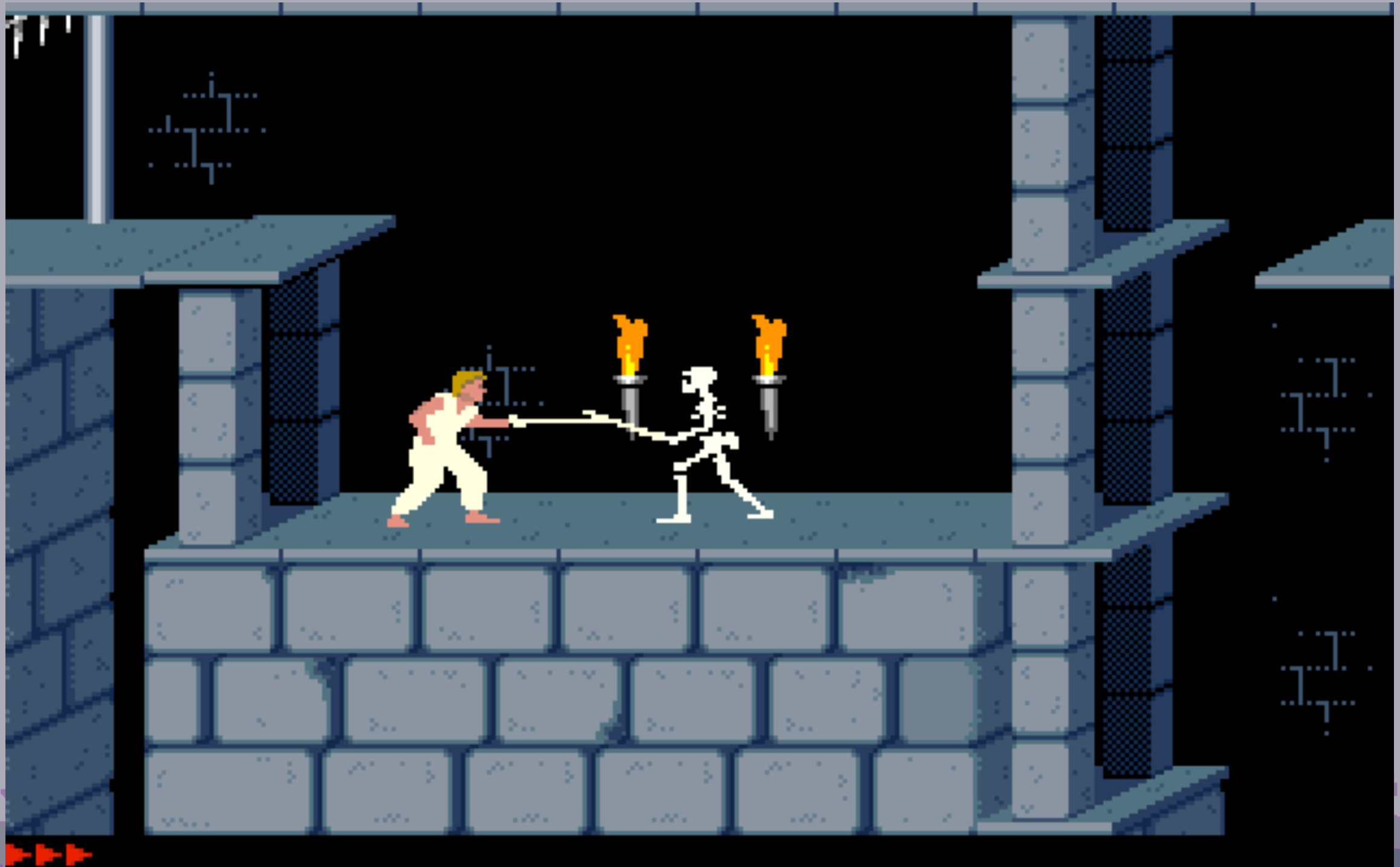- ▶ canabalt.com

Artwork Inspiration

Flashback: The Quest for Identity

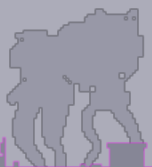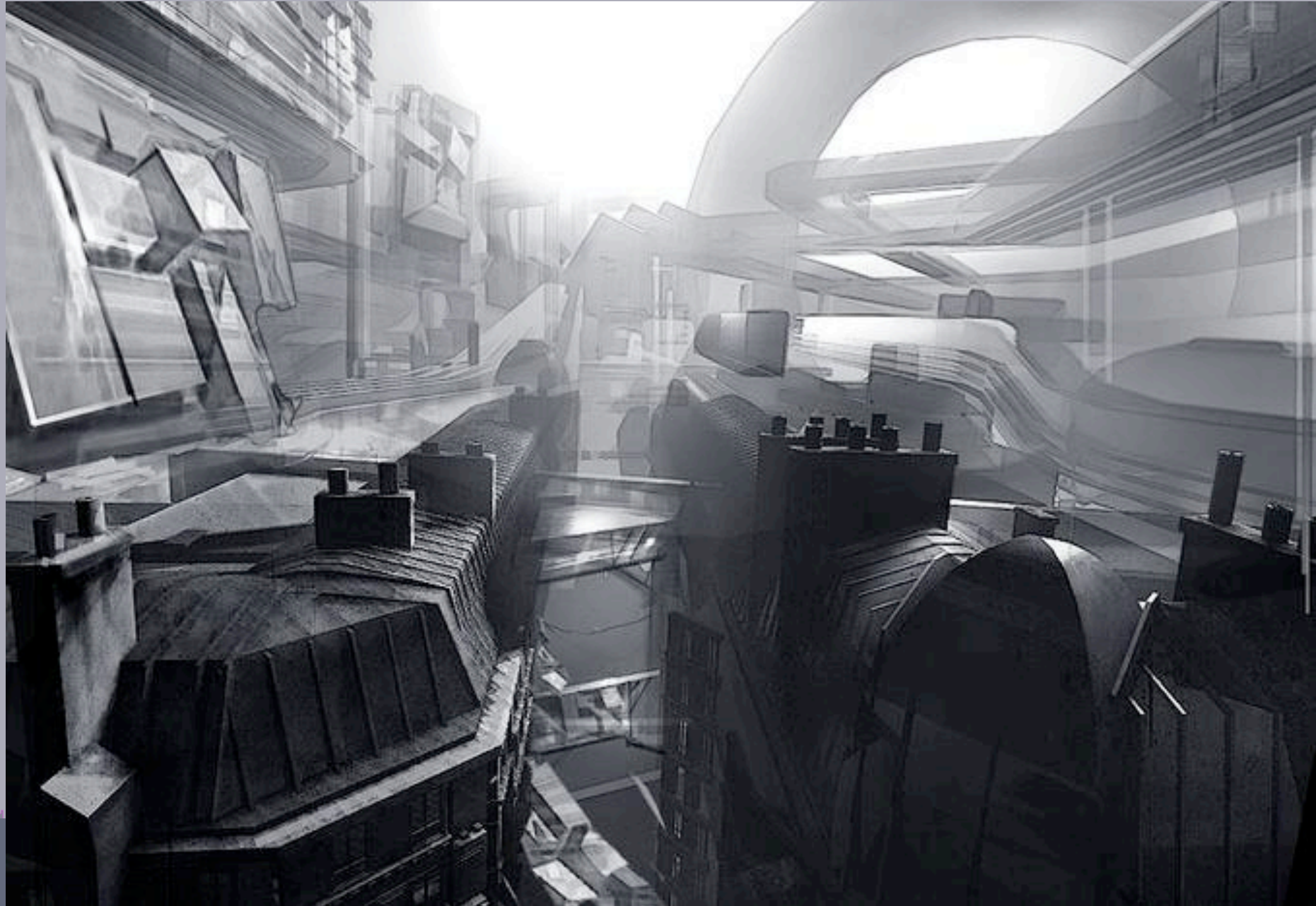# Another World, Eric Chahi

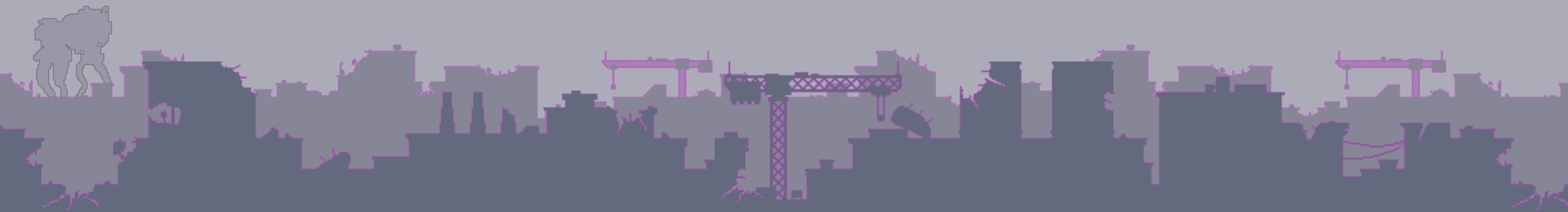# Prince of Persia, Jordan Mechner

Blomkamp's District 9

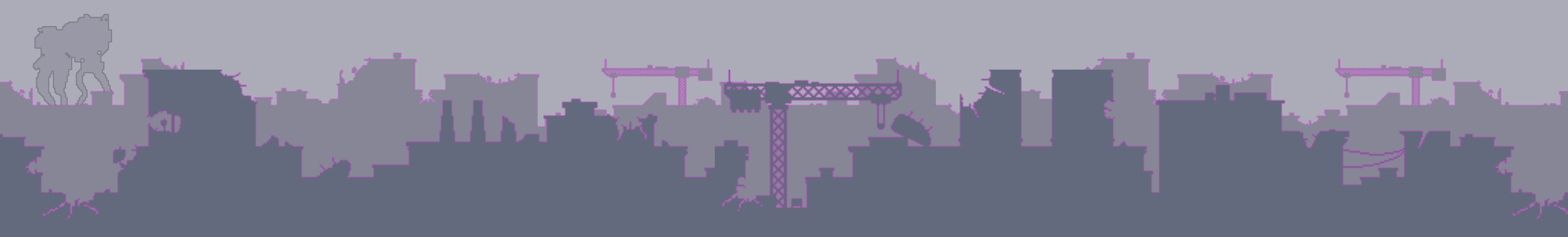# Viktor Antonov,
Art Director, Half Life 2

Level Generation

Building Spacing

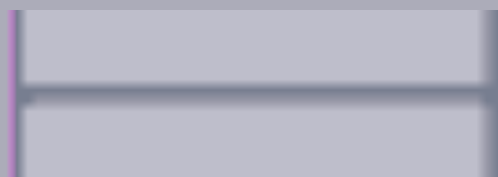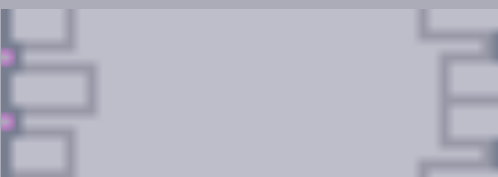▶ Inspired by a traditional, "the farther you go, the harder it gets" formula

▶ evolved into a speed based formula

Buildings:"Lego Pieces"
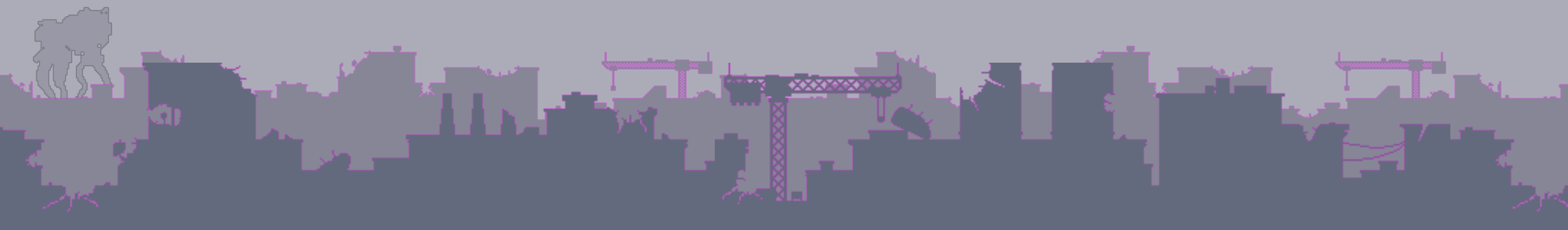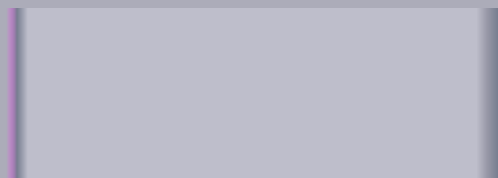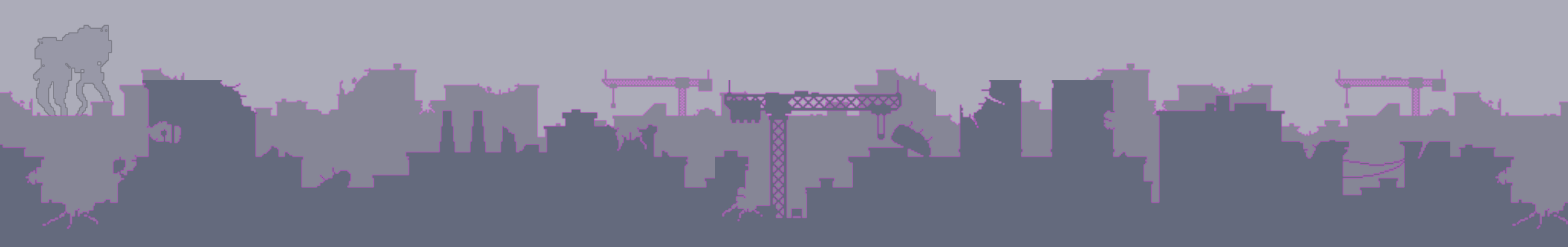
Guerilla Marketing

Free Flash Version

- Won't that hurt sales?
  - no Flash on iPhone
  - try before you buy
  - feel good about supporting indie developers

Aggregators

- ▸ stumbleupon.com → adamatomic.com
  - ▸ 190,000 hits

Twitter

▸ *I ran 4089m before hitting a wall and tumbling to my death on my iPhone* www.canabalt.com

▸ adamatomic.com 13,000 hits

▸ canabalt.com 41,000 hits
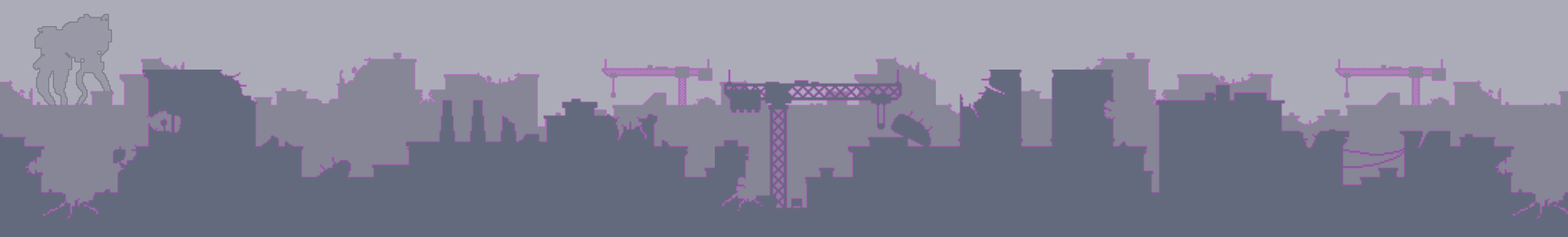
App Store Specifics

Sales / Piracy

▶ Just over 115,000 units in 5 months

▶ Estimated 20% piracy rate

$2.99 (Gasp)

▶ *"Rarely do I feel ripped of in the app store"*

▶ *"It should be free, or no more than .99"*

▶ *"Worth every penny"*

▶ *"This game is a value at $3"*

$2.99 (Gasp)

Canabalt
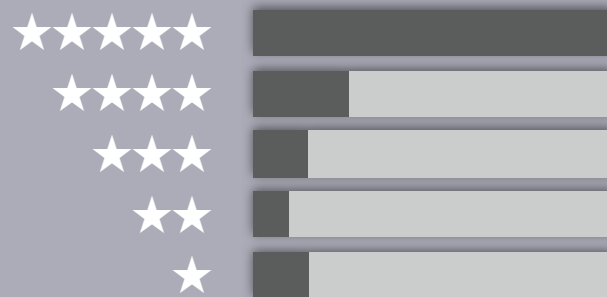
A Top 10 0.99 Game
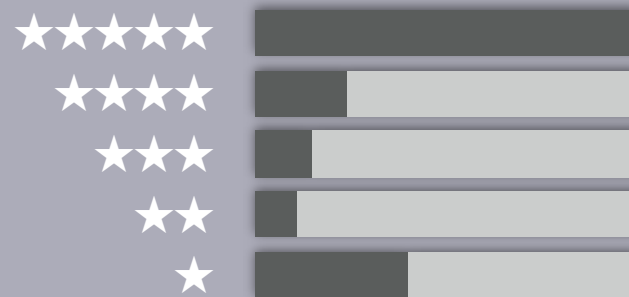
A Top 10 Free Game
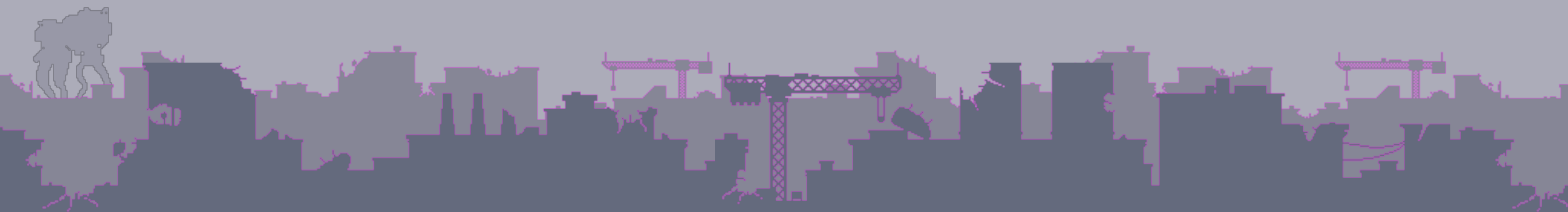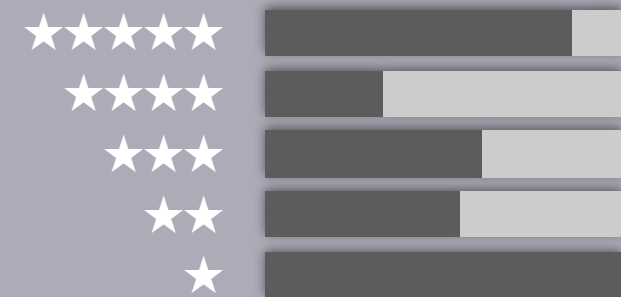
$2.99 (Gasp)

▶ generally must be a dollar to make it to top 10

▶ must be more than a dollar to sustain a company outside of the top 10
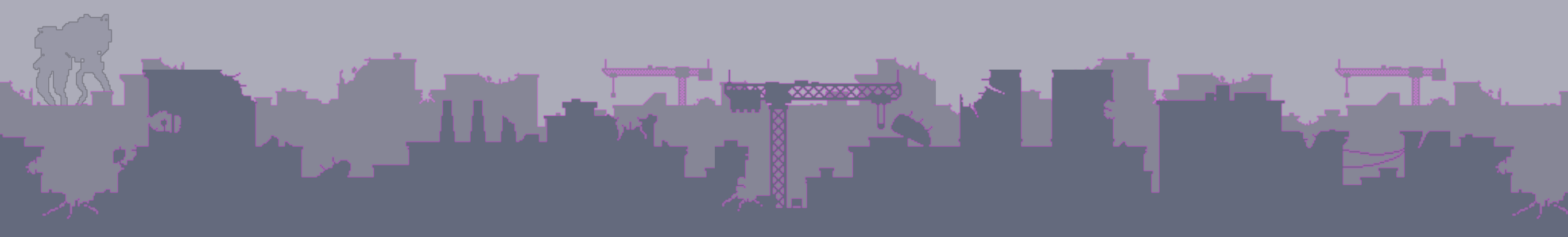
iPhone Port

Canabalt on the iPhone

▸ Flash version of Canabalt built around flixel

  ▸ 2D game library for Flash

▸ iPhone port of Canabalt includes a quick port of the flixel library

  ▸ very quick and dirty, porting work for flixel and Canabalt completed in just under 2 weeks

  ▸ Objective-C only, no C++

    ▸ Objective-C can be a very productive language once you get the hang of it

Flixel

▸ Rapid Game prototyping

▸ Strengths

  ▸ anyone can quickly and cheaply make games anywhere, just need Flash

▸ Weaknesses

  ▸ 3D, physics, and tweening all have to be done using external libraries

  ▸ current implementation limited to Flash

Optimizations

OpenGL Optimization

▸ Transparent objects infrequent

    ▸ menu page only in Canabalt

▸ Dynamically check whether to enable Alpha blending

```
if (alpha != 1.0) {
  glEnableClientState(GL_COLOR_ARRAY);
  glColorPointer(4, GL_UNSIGNED_BYTE, 0, colors);
}
//glVertexPointer, glTexCoordPointer, glDrawArrays
if (alpha != 1.0)
  glDisableClientState(GL_COLOR_ARRAY);
```

OpenGL Optimization

▸ Interleaved vertices and texture coordinates, GLshort instead of GLfloat

```
#define TEX_SCALE (512.0)
#define SCALE_TEX(t) ((GLshort)((t)*TEX_SCALE))
...
glMatrixMode(GL_TEXTURE);
glLoadIdentity();
glScalef(1/TEX_SCALE, 1/TEX_SCALE, 1.0);
...

vertsCoords[i] = SCALE_TEX(20.0);
...
glVertexPointer(2, GL_SHORT, sizeof(GLshort)*4, &
(vertsCoords[0]));
glTexCoordPointer(2, GL_SHORT, sizeof(GLshort)*4, &
(vertsCoords[2]));
```
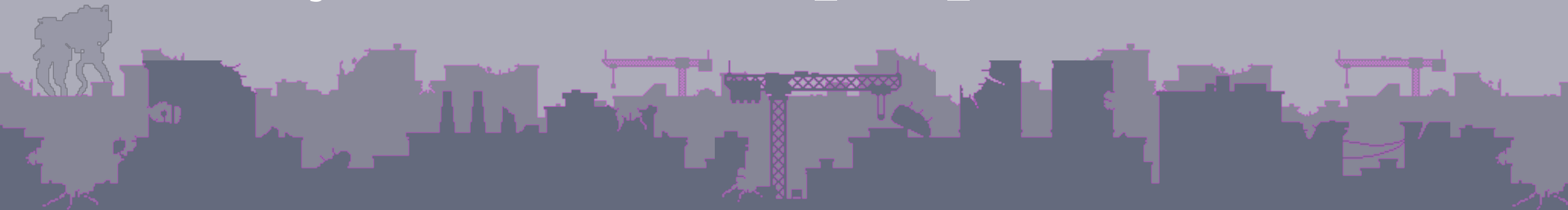
Memory Optimization

▸ For a finite group of objects that are used over and over again (e.g. doves)

  ▸ statically allocate pool of objects in memory
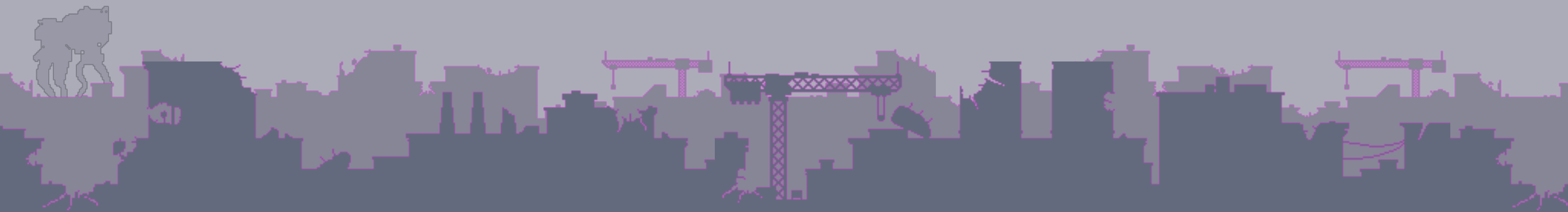
```
+ (void) initialize {
doves = malloc(sizeof(Dove *) * doveCount);
for (int i=0; i<doveCount; ++i)
   doves[i] = [[Dove alloc] init];
}
```

  ▸ override retain/release methods, create an allocator

```
- (id) retain { rtnCnt++; return self; }
- (oneway void) release { if (--rtnCnt == 0) freeDove(); }
+ (id) dove { return nextAvailableDove(); }
```
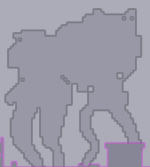
Special Announcement

Flixel for iPhone

▸ Public release of flixel for iPhone nearing completion

▸ Rudimentary Actionscript 3 to Objective-C translator, to accelerate iPhone ports of flixel games

  ▸ will not translate just any generic Actionscript 3 program

  ▸ does not yet produce 100% compilable code (but hopefully will soon)

  ▸ but it gets you maybe 90% of the way!

▸ Private beta release very soon, with a public release to follow

▸ email flixel@semisecretsoftware.com to be notified

Questions?