

#### 雪碧图逐帧动画抖动解决方案

## 移动端的适配方案

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- 1. 百分比
- 2. 断点(media require)
- 3. Rem
- 4. Meta initial-scale
- 5. Transfrom scale
- 6. Viewport units(vw/vh)
- 7. Zoom

### 营销活动的适配方案

Viewport units(vw/vh) + Rem

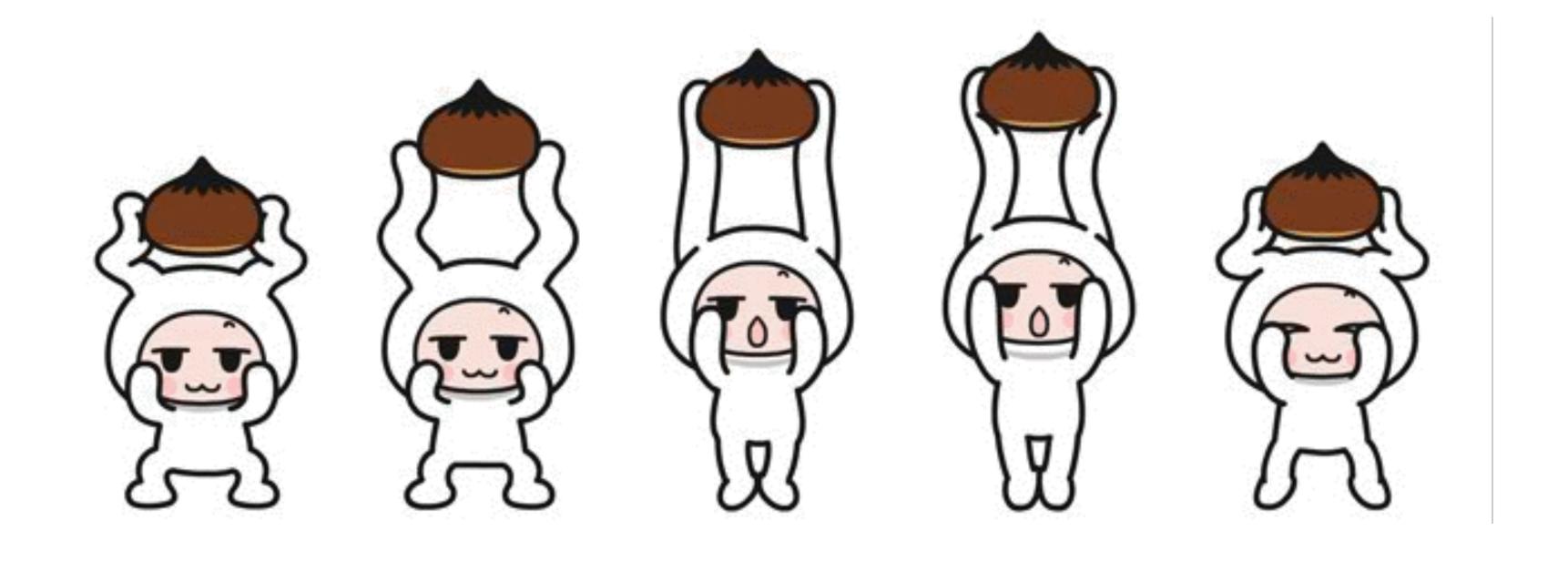
## Rem适配的三个痛点

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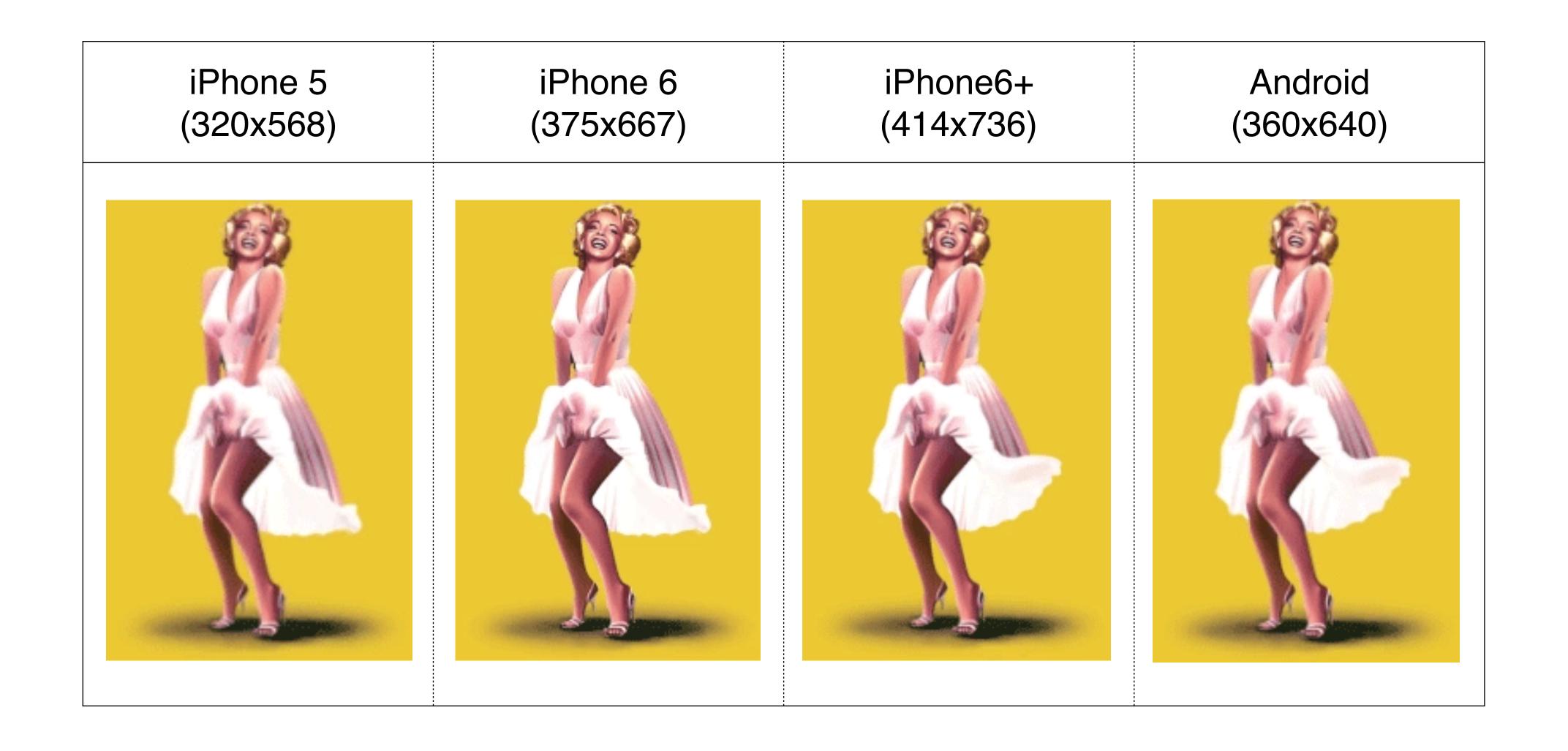
- 微观尺寸(20px左右)定位不准
- 逐帧动画容易有抖动
- line-height 不精准

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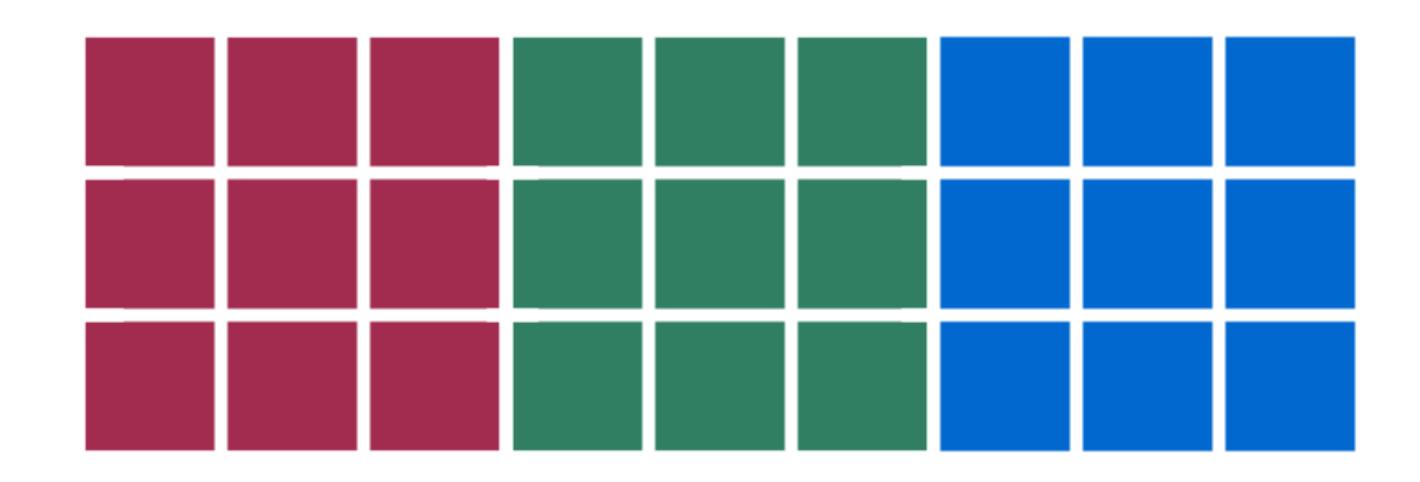


举个抖动的例子

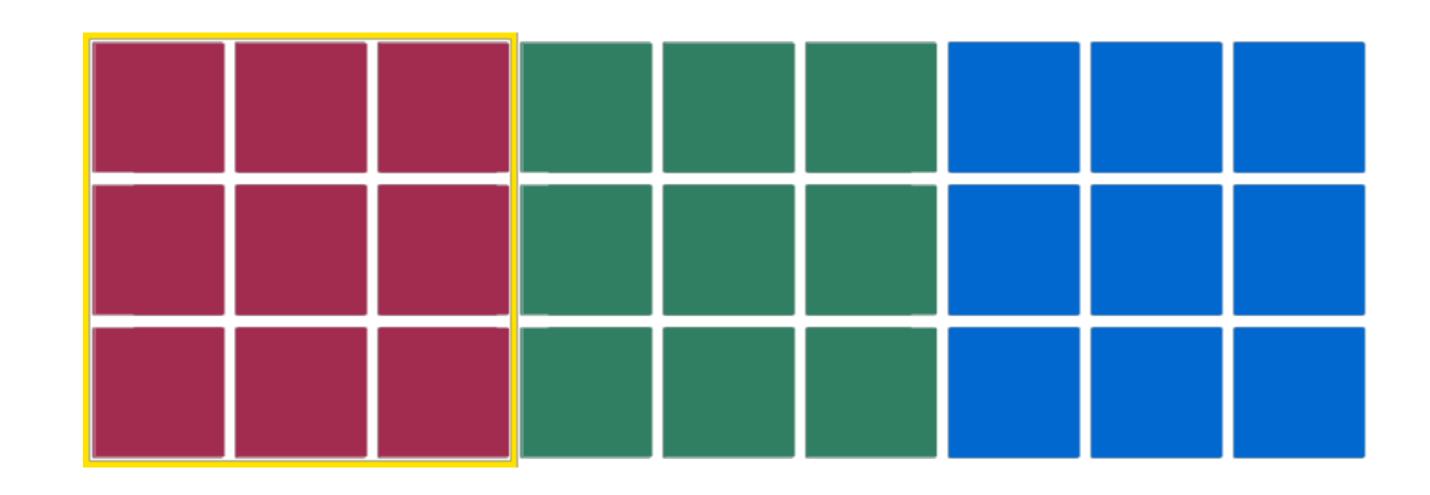


### 为什么会发生抖动?

dpr & background-size scale



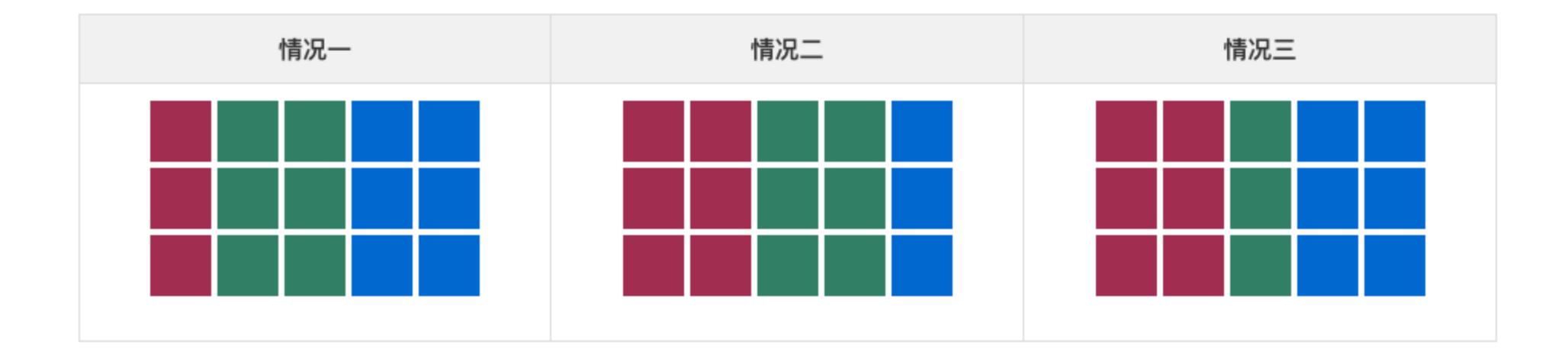
sprite — background-size: 9px \* 3px

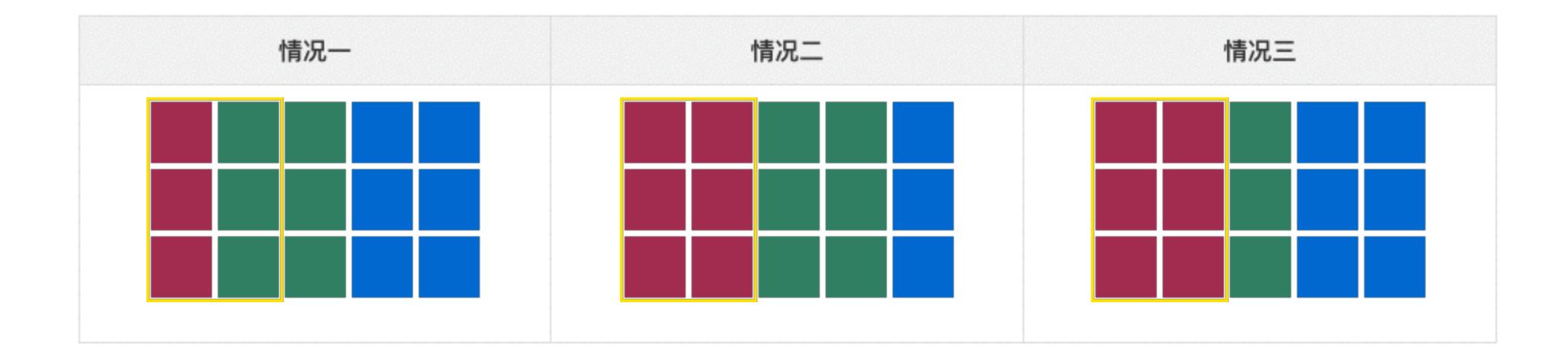


sprite — background-size: 9px \* 3px

## background-size/2

背景图片缩小一倍



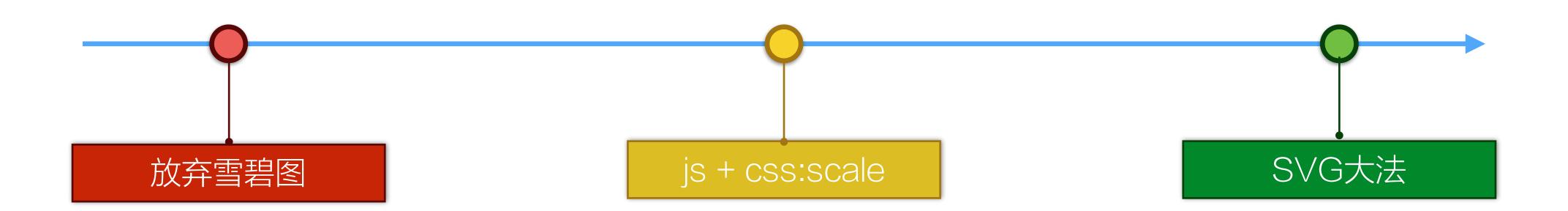


#### 结论

background-size of sprite 缩放后,原来均分的 帧发生成不均分现象,这是逐帧抖动的原因

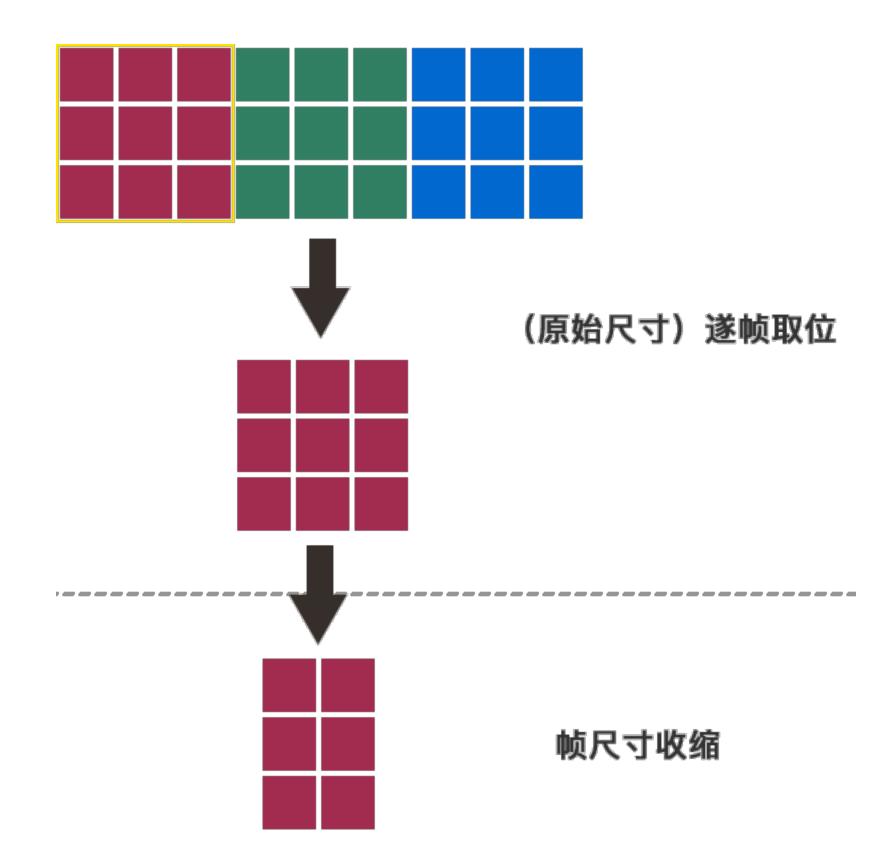
## 抗抖之路

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js + css:scale

#### SVG大法



#### SVG大法

```
<svg viewBox="0, 0, 450, 450" class="steps_anim">
    <image xlink:href="//jdc.jd.com/fd/promote/leeenx/201708/sprite.png" width="3600" height="450" />
    </svg>
```

```
.steps_anim {
   position: absolute;
   width: rem(450 / 2);
   height: rem(450 / 2);
   top: 50%;
   left: 50%;
   margin: -5.625rem 0 0 -5.625rem;
   image {
      animation: step 6s steps(8) infinite;
   }
}

@keyframes step {
   100% {
      transform: translate3d(-3600px, 0, 0);
   }
}
```

## 面向自动化工具(Athena)

- 自动化工具只处理 css 的图片 (background-image)
- SVG 不支持 background-image



## ForeignObject

ForeignObject 允许向 SVG 插入 HTML

## ForeignObject

IE	Edge	Firefox	Chrome	Safari	Opera	iOS Safari	Opera Mini*	Android * Browser	Blackberry Browser	Opera * Mobile	Chrome for Android	Firefox for Android	IE Mobile	UC Browser for Android	Samsung Internet	QQ Browser	Baidu Browser
		43	48	3.2	34												
		44	49	4	35	3.2											
		45	50	5	36	4.1											
		46	51	5.1	37	4.3		2.1									
		47	52	6	38	5.1		2.2									
		48	53	6.1	39	6.1		2.3									
		49	54	7	40	7.1		3									
6		50	55	7.1	41	8		4									
7		51	56	8	42	8.4		4.1									
8	12	52	57	9	43	9.2		4.3									
12 9		53	58	9.1	44	9.3		4.4		12							
<sup>12</sup> 10	<sup>2</sup> 14	54	59	10	45	10.2		4.4.4	7	12.1			10		4		
<sup>12</sup> 11	<sup>2</sup> 15	55	60	10.1	46	10.3	all	56	10	37	59	55	11	11.4	5	1.2	7.12
	<sup>2</sup> 16	56	61	11	47	11											
		57	62	TP	48												
		58	63														

## ForeignObject

```
<svg viewBox="0, 0, 360, 540" class="steps_anim">
    <foreignObject class="html" width="360" height="540">
        <div class="img"></div>
        </foreignObject>
    </svg>

<\analymaplect>
```

```
.steps_anim {
 position: absolute;
 width: 9rem;
 height: 13.5rem;
 top: 50%;
 left: 50%;
 margin: -5.625rem 0 0 -5.625rem;
.html {
 widt\overline{h}: 360px;
 height: 540px;
.img {
 width: 1800px;
 height: 540px;
 background: url(images/m.png) 0 0 no-repeat;
 background-size: 1800px 540px;
 animation: step 1.2s steps(5) infinite;
keyframes step {
 100% {
    background-position: -1800px 0;
```



https://aotu.io/notes/2017/08/14/fix-sprite-anim/

# THANKS FOR YOUR WATCHING

