

With HTML5 Canvas and jQuery



Supercharged

JavaScript Graphics

O'REILLY®

Raffaele Cecco

Table of Contents

Preface	ix
1. Code Reuse and Optimization	1
Keeping It Fast	4
What and When to Optimize	5
Homespun Code Profiling	7
Optimizing JavaScript	8
Lookup Tables	8
Bitwise Operators, Integers, and Binary Numbers	12
Optimizing jQuery and DOM Interaction	19
Optimizing CSS Style Changes	20
Optimizing DOM Insertion	23
Other Resources	23
2. DHTML Essentials	25
Creating DHTML Sprites	25
Image Animation	26
Encapsulation and Drawing Abstraction (aka Hiding Stuff)	28
Minimizing DOM Insertion and Deletion	28
The Sprite Code	28
A Simple Sprite Application	30
A More Dynamic Sprite Application	32
Converting into a jQuery Plug-in	35
Timers, Speed, and Frame Rate	38
Using setInterval and setTimeout	38
Timer Accuracy	40
Achieving Consistent Speed	41
Internet Explorer 6 Background Image Caching	45
3. Scrolling	47
CSS-Only Scrolling Effects	47

Scrolling with JavaScript	51
Background Image Scrolling	51
Tile-Based Image Scrolling	53
4. Advanced UI	69
HTML5 Forms	69
Using JavaScript UI Libraries	71
Using jQuery UI for Enhanced Web Interfaces	71
Heavy Duty UI with Ext JS	75
Creating UI Elements from Scratch	78
Creating a 3D Carousel	79
5. Introduction to JavaScript Games	91
Game Objects Overview	92
The Game Code	94
Game-Wide Variables	94
Reading Keys	95
Moving Everything	97
A Simple Animator	98
Collision Detection	99
Aliens	104
The Player	110
Shields	113
Mystery Saucer	114
The Game	115
Putting It All Together	119
6. HTML5 Canvas	123
Canvas Support	124
Bitmaps, Vectors, or Both?	124
Canvas Limitations	125
Canvas Versus SVG	125
Canvas Versus Adobe Flash	126
Canvas Exporters	127
Canvas Drawing Basics	129
The Canvas Element	129
The Drawing Context	129
Drawing Rectangles	130
Drawing Paths with Lines and Curves	130
Drawing Bitmap Images	138
Colors, Strokes, and Fills	140
Animating with Canvas	144
Canvas and Recursive Drawing	147

Canvas Tree Page Layout	149
Replacing DHTML Sprites with Canvas Sprites	149
The New CanvasSprite Object	150
Other Code Changes	151
A Graphical Chat Application with Canvas and WebSockets	151
The WebSockets Advantage	152
WebSockets Support and Security	153
The Chat Application	154
7. Vectors for Games and Simulations	167
Operations on Vectors	170
Addition and Subtraction	170
Scaling	171
Normalization	171
Rotation	171
Dot Product	172
Creating a JavaScript Vector Object	173
A Cannon Simulation Using Vectors	174
Simulation-Wide Variables	175
The Cannonball	176
The Cannon	176
The Background	178
The Main Loop	179
Page Layout	179
Rocket Simulation	180
The Game Object	181
The Obstacle Object	182
The Rocket Object	183
Background	186
Collision Detection and Response	186
Page Code	189
Possible Improvements and Modifications	190
8. Google Visualizations	193
Limitations	194
Chart Glossary	196
Image Charts	197
Data Formats and Chart Resolution	199
Using Dynamic Data	203
Summary	207
Interactive Charts	207
Interactive Charts Events	211

9. Reaching the Small Screen with jQuery Mobile	215
jQuery Mobile	216
TilePic: A Mobile-Friendly Web Application	218
TilePic Game Description	218
TilePic Game Code	220
PhoneGap	230
10. Creating Android Apps with PhoneGap	231
Installing PhoneGap	232
Installing the Java JDK	232
Installing the Android SDK	233
Installing Eclipse	234
Installing Android Development Tools	235
Installing PhoneGap	236
Creating a PhoneGap Project in Eclipse	236
Altering the App.java File	238
Altering the AndroidManifest.xml File	239
Creating and Testing a Simple Web Application	240
Testing the TilePic Application	241
Index	243