

# CONTENTS IN DETAIL

<b>ACKNOWLEDGMENTS</b>	<b>xv</b>
------------------------	-----------

<b>INTRODUCTION</b>	<b>xvii</b>
---------------------	-------------

About This Book . . . . .	xviii
How to Use This Book . . . . .	xix
About the Website . . . . .	xix

<b>1</b>	
<b>MAPPING BASICS</b>	<b>1</b>

The Mapping APIs: Google, Yahoo!, and Mapstraction . . . . .	2
Describe a Point on the Earth . . . . .	3
Convert Between Decimal and Degree Formats . . . . .	5
Determine Precision of Decimal Coordinates . . . . .	6
Create Your First Map . . . . .	7
Create a Google Map . . . . .	7
Create a Yahoo! Map . . . . .	9
Create a Mapstraction Map . . . . .	10
Use Yahoo! Maps with Mapstraction . . . . .	12
Find the Underlying Map Tiles . . . . .	13
Change the Map Size . . . . .	15
Add Zoom and Other Controls . . . . .	16
Small Controls . . . . .	16
Large Controls . . . . .	16
Map-Type Controls . . . . .	17
Set Zoom Level . . . . .	18
Set Map Type . . . . .	19
Recenter the Map . . . . .	20
Retrieve the Center of the Map . . . . .	20
Find Point Where User Clicked . . . . .	21

<b>2</b>	
<b>PLOTTING MARKERS AND MESSAGE BOXES</b>	<b>23</b>

#1: Add a Marker to Your Map . . . . .	24
#2: Remove or Hide a Marker . . . . .	26
#3: Show a Message Box When Your Marker Is Clicked . . . . .	27
#4: Show and Hide Message Boxes Without Clicking the Marker . . . . .	29
#5: Create a Custom Icon Marker . . . . .	29
Get Out the Image Editor . . . . .	29
Add Your Icon to the Map . . . . .	30
#6: Create Numbered Markers . . . . .	31
Generate the Numbered Icon . . . . .	31
Add the Icon to the Map . . . . .	32
#7: Loop Through All Markers . . . . .	34

#8: Determine the Correct Zoom Level to Use Based on Markers . . . . .	34
#9: Filter Out Certain Markers . . . . .	36
#10: Remove or Hide All Markers . . . . .	38
#11: Handle Clusters of Markers . . . . .	39
Change the Cluster Icon . . . . .	41

### **3**

## **GEOCODING**

## **43**

How Do Geocoders Work? . . . . .	44
JavaScript vs. HTTP Geocoding . . . . .	45
#12: Geocode with JavaScript . . . . .	46
Geocode User Input . . . . .	48
#13: Geocode with an HTTP Web Service . . . . .	49
Use Google's Geocoding Web Service . . . . .	49
Use Yahoo!'s Geocoding Web Service . . . . .	53
Other Geocoding Web Services . . . . .	54
#14: Reverse Geocoding: Get an Address from a Point . . . . .	54
Reverse Geocode with JavaScript . . . . .	55
Reverse Geocode in a Click . . . . .	56
Reverse Geocode with Google's Web Service . . . . .	57
#15: Get Postal Code Coordinates . . . . .	58
Install a Postal Code Database . . . . .	59

### **4**

## **LAYER IT ON**

## **61**

#16: Draw Lines on a Map . . . . .	62
Draw Multiple Line Segments . . . . .	63
Set the Color and Thickness . . . . .	65
#17: Draw Shapes on a Map . . . . .	65
Set the Fill Color and Opacity . . . . .	67
#18: Add Circles to Show Search Radius . . . . .	67
Approximate with a Polygon . . . . .	67
Overlay a Circle Image . . . . .	69
#19: Draw a Rectangle to Declare an Area . . . . .	71
#20: Draw Lines Along Clicks . . . . .	72
#21: Color States/Countries on a Map . . . . .	74
#22: Add Custom Controls . . . . .	76
#23: Create Your Own Zoom Interface . . . . .	79
#24: Plot Image Thumbnails on a Map . . . . .	81
#25: Overlay an Image on a Map . . . . .	83
Geo-Reference Your Map . . . . .	85
Apply Warped Map . . . . .	87
#26: Use Custom Tiles . . . . .	90
How Many Pixels Wide Is the Earth? . . . . .	90
Start a Tile Drawer EC2 Instance . . . . .	91
Declare User Data for Your Instance . . . . .	92
Tile Drawer Does Its Job . . . . .	94
Add Tile Overlays to Your Map . . . . .	95
Create Your Own Tile Styles . . . . .	97

<b>5</b>		
<b>HANDLE MAP EVENTS</b>		<b>101</b>
Mapstraction's Event Model . . . . .		102
#27: The User Clicks the Map . . . . .		103
#28: The User Drags the Map . . . . .		103
#29: The Zoom Level Changes . . . . .		105
#30: A Marker Is Added to or Removed from the Map . . . . .		106
#31: A Polyline Is Added to or Removed from the Map . . . . .		106
#32: The User Opens or Closes a Message Box . . . . .		107
#33: The User Clicks a Marker . . . . .		108
#34: Return to the Center When the Message Box Is Closed . . . . .		109
Preserve the Previous Center . . . . .		110
#35: The User Moves the Map Outside Preset Bounds . . . . .		112
<b>6</b>		
<b>EXPLORE PROXIMITY</b>		<b>117</b>
#36: Calculate Distance Between Two Points . . . . .		117
Could You Throw an Object Across a River? . . . . .		119
#37: Find True Distance with Routing . . . . .		120
#38: Create Driving Directions . . . . .		122
#39: Determine Closest Marker . . . . .		125
#40: Find a Point Along a Line . . . . .		128
Plot Your Route . . . . .		129
Find Your Bearing . . . . .		130
Determine New Point . . . . .		131
#41: Plot Local Results on a Map . . . . .		133
#42: Retrieve Local Results with HTTP . . . . .		134
Parse Local Results with PHP . . . . .		136
Other Useful Parameters . . . . .		137
#43: Check Whether a Point Is Within a Bounding Box . . . . .		137
Can You Click Inside the Box? . . . . .		139
#44: Get a Random Point in a Bounding Box . . . . .		140
#45: Check Whether a Point Is Within a Shape . . . . .		142
Find the Polygon's Bounding Box . . . . .		143
Connect Our Point to an Outside Point . . . . .		145
Check for Line Intersections . . . . .		146
Perform the Hit Test . . . . .		147
You Clicked in Utah! . . . . .		148
#46: Get Nearest Locations from Your Own Database . . . . .		150
<b>7</b>		
<b>USER LOCATION</b>		<b>153</b>
#47: Ask Users Where They Are . . . . .		154
Get Input Using JavaScript . . . . .		154
Get Input Using PHP . . . . .		155
#48: Get Location Using JavaScript . . . . .		157
Where Does the Data Come From? . . . . .		158
What Other Data Can We Get? . . . . .		159
Use the Location on the Map . . . . .		159

Receive Continual Updates . . . . .	160
Additional Geolocation Options . . . . .	161
#49: Use Fire Eagle to Get Location . . . . .	162
Get the Fire Eagle Essentials . . . . .	163
Authenticate the User . . . . .	163
Answer the Call . . . . .	164
Get the User's Location . . . . .	165
#50: Get Location by IP . . . . .	166
Use the HostIP Web Service . . . . .	167
Use Google's ClientLocation JavaScript Object . . . . .	168
#51: Roll Your Own IP Database . . . . .	169
Import IP Data . . . . .	170
Find an IP's Location . . . . .	171

## **8 DATA FORMATS 173**

#52: Use XML . . . . .	174
Parse XML with JavaScript . . . . .	174
Parse XML with jQuery JavaScript Library . . . . .	176
Parse XML with PHP . . . . .	177
#53: Use JSON . . . . .	180
Parse JSON with JavaScript and jQuery . . . . .	181
Parse JSON with PHP . . . . .	182
#54: Use GeorSS . . . . .	184
Use Alternate GeorSS Encodings . . . . .	186
Display GeorSS on a Map . . . . .	187
#55: Use KML . . . . .	188
Lines in KML . . . . .	189
Polygons in KML . . . . .	190
Style KML . . . . .	191
Display KML on a Map . . . . .	193
#56: Use GPX . . . . .	194
Examples of GPX . . . . .	195
Display GPX Tracks on a Map . . . . .	195
#57: Convert from XML to JSON . . . . .	198
Convert Using PHP . . . . .	198
Convert Using Yahoo! Pipes . . . . .	199
#58: Filter, Merge, and Sort Data with Yahoo Pipes! . . . . .	200
Filter Your Feed's Content . . . . .	201
Merge Two or More Feeds . . . . .	202

## **9 GO SERVER-SIDE 205**

#59: Install PHP . . . . .	206
Check Your Web Host for PHP . . . . .	206
Use a Packaged Installation of PHP . . . . .	207
Install PHP Yourself . . . . .	208
#60: A Quick PHP Introduction . . . . .	208
The Nitty Gritty . . . . .	208
Taking Input . . . . .	210

If This Is True, Then Do That . . . . .	211
Quite the Array . . . . .	212
Feelin' Loopy . . . . .	213
Get Functional . . . . .	214
#61: Retrieve a Web Page . . . . .	215
Include Your Function in Other Scripts . . . . .	217
#62: Install MySQL . . . . .	217
Check Your Web Host for MySQL . . . . .	218
Use a Packaged Installation of MySQL . . . . .	218
Install MySQL Yourself . . . . .	219
#63: Store Locations to a Database . . . . .	219
Create a New Database . . . . .	220
Create a Database Table . . . . .	220
Add Data to Your Places Table . . . . .	222
#64: Import Data from a Spreadsheet . . . . .	223
#65: Use MySQL from PHP . . . . .	225
#66: Plot Locations from a Database . . . . .	226
Output All Places as JSON . . . . .	226
Plot Places from JSON . . . . .	228
#67: Get Nearest Locations from a Database . . . . .	229
Improve Your Query's Performance . . . . .	230
Precalculate Values in New Columns . . . . .	231
#68: Get Nearest Locations to a Postal Code . . . . .	232

## 10

### MASHUP PROJECTS

**235**

What Is a Mashup? . . . . .	235
The Projects . . . . .	236
#69: Create a Weather Map . . . . .	237
Prepare a Basic US Map . . . . .	237
Convert Weather Results to JSON . . . . .	239
Plot Conditions on the Map . . . . .	241
Add a Forecast Details Pane . . . . .	244
#70: Display Recent Earthquakes Worldwide . . . . .	247
Show Earthquakes with GeoRSS . . . . .	248
Create a Custom Earthquake Map . . . . .	250
#71: Search Music Events by Location . . . . .	260
Prepare HTML for Search Interface . . . . .	261
Perform an Upcoming API Search . . . . .	263
Retrieve Event Data Server-Side . . . . .	264
Plot Event Search Results on a Map . . . . .	267
Filter Results by Ticket Price . . . . .	269
#72: Plot Twitter Geo-Tweets . . . . .	270
Prepare the Map with User Location . . . . .	271
Geocode User Input . . . . .	273
Retrieve Geo-Tweets from Twitter . . . . .	274
#73: Find a Coffee Shop to Meet in the Middle . . . . .	277
Prepare the Map and Form . . . . .	278
Retrieve Driving Directions . . . . .	280
Find the Route's Midpoint . . . . .	282
Search for Coffee on Yelp . . . . .	285

**A**  
**JAVASCRIPT QUICK START** **289**

Where JavaScript Goes . . . . .	289
Variables . . . . .	291
Arithmetic . . . . .	292
Arrays . . . . .	293
Objects . . . . .	294
Conditionals . . . . .	294
Loops . . . . .	296
Functions. . . . .	297
Variable Scope. . . . .	298
Anonymous Functions . . . . .	300
Using jQuery. . . . .	301
Query Document Objects. . . . .	301
Insert and Hide Content . . . . .	302
Use Browser Events . . . . .	303
Load Files and Data . . . . .	305

**B**  
**MAPSTRACTION REFERENCE** **307**

Class mxn.Mapstraction . . . . .	308
Class mxn.BoundingBox . . . . .	324
Class mxn.LatLonPoint. . . . .	326
Class mxn.Marker . . . . .	328
Class mxn.Polyline . . . . .	334
Namespace mxn.util. . . . .	336

**INDEX** **341**