CONTENTS

Acknowledgments v

Series Editor's Introduction vii

1. What Is Nonparametric Regression? 1

1.1 Preliminary Examples 3
1.1.1 Infant Mortality 3
1.1.2 Married Women's Labor-Force Participation 3
1.1.3 Prestige of Canadian Occupations 5
1.2 Plan of This Monograph 6
1.3 Notes on Background, Approach, and Computing 6

2. Binning and Local Averaging 8
2.1 Binning 9
2.1.1 Statistical Considerations* 11
2.2 Local Averaging 13
2.2.1 Moving Averages for Time-Series Data 17

3. Kernel Estimation 17

4. Local Polynomial Regression 19
4.1 Selecting the Span 23
4.2 Statistical Issues in Local Regression* 28
4.3 Bandwidth Revisited* 30
4.3.1 Selecting the Span by Cross-Validation 36
4.4 Making Local Regression Resistant to Outliers 39
4.4.1 Normal Quantile-Comparison Plots of Residuals 42
4.5 Displaying Spread and Asymmetry* 45
4.6 Smoothing Time-Series Data* 46

5. Statistical Inference for Local-Polynomial Regression 50
5.1 Confidence Envelopes 51
5.2 Hypothesis Test 54

5.3 Some Statistical Details and Alternative Inference Procedures* 56
5.3.1 The Smoother Matrix and the Variance of $\hat{y}$ 56
5.3.2 Degrees of Freedom 58
5.3.3 A Caveat 59
5.3.4 Bootstrap Confidence Bands 60
5.3.5 Randomization Tests 63

6. Splines* **65**
6.1 Regression Splines 65
6.2 Smoothing Splines 67
6.3 Equivalent Kernels 69

7. Nonparametric Regression and Data Analysis **71**
7.1 The "Bulging Rule" 71
7.2 Partial-Residual Plots 75
7.3 Concluding Remarks 77

Notes **79**

References **81**

About the Author **83**

*Sections marked by an asterisk contain more difficult material. See page 8 for details.