Erratum

1 Chapter 1

2 Chapter 2

Page 23 – "plotted in Figure 2.5" (via Christoph Hanck)

Page 25 – description of the Gaussian kernel should read "as $s \to \infty$, $k_s(\psi) \to e^{-(1/2)\psi^2}$" and not as $h \to \infty$ (further note that we also need to dump the indicator function)

Page 33 – line 4, line 1, should refer to Table 2.3 (via Christoph Hanck)

Page 38 – Equation 2.2 needs square brackets on the first term $\int \left[\widehat{f}(x) - f(x)\right]^2 dx$ (via Michael O'Hara)

Page 40 – last line of first paragraph, we mean to refer to Equation 2.23

Page 46 – Müller is mispelled (via Christoph Hanck)

Page 46 – line -2, we mean to refer to Table 2.3 (via Christoph Hanck)

Page 48 – line 2 above the AMSE formula, should read $n^{-1}h^{-(1+2r)}$ (via Alice Sheehan)

3 Chapter 3

Page 73 – line -5, there is a typesetting error (via Christoph Hanck)

$$B_d = (1/2)\frac{\partial^2 f_{y|\mathbf{x}}(y|\mathbf{x})}{\partial x_d^2} + f_{\mathbf{x}}(\mathbf{x})^{-1}\frac{\partial f_{y|\mathbf{x}}(y|\mathbf{x})}{\partial x_d}\frac{\partial^2 f_{\mathbf{x}}(\mathbf{x})}{\partial x_d}$$

Page 73 – it should be noted that $h_0 = h_y$ and $|\mathbf{h}|$ continues to be $h_1 h_2 \cdots h_q$ (via Christoph Hanck)

Page 75 – line 2, "third" term does not depend upon the bandwidth (via Christoph Hanck)

4 Chapter 4

Page 88 – Figure 4.4 – the cummulative distances were calculated over 250 points as opposed to simply integrating over the theoretical functions, hence the cummulative ISE should be approximately 0.0163 instead of 0.2042 as stated on Page 87, but note that the shapes of the functions and intution remain the same (via Christoph Hanck)

Page 88 – the KL distance should be defined as (via Christoph Hanck)

$$KL(f,g) = \int_x f(x)\log\left\{\frac{f(x)}{g(x)}\right\}dx$$

Page 92 – Fan and Ullah (1999) should not cite their 1999 *Journal of Multivariate Analysis* paper, rather Fan and Ullah (1999) "On Goodness of Fit Tests for Weakly Dependent Processes Using Kernel Methods," *Journal of Nonparametric Statistics*, 11, 337-360 (via Aman Ullah)

Page 95 – we were sloppy and wrote that the sample moment was equal to the population moment for the variance term $\widehat{\sigma}_n^2$ (via Christoph Hanck)

Page 101 – the symmetry test statistic should read

$$\widehat{T}_n = nh^{1/2}\frac{\widehat{ISE}_n}{\widehat{\sigma}_n} \xrightarrow{d} N(0,1)$$

Page 103 – formula 4.2, the exponent $(-1/2)$ is missing in the first factor in that product, it should read (via Kiril Mayorov)

$$x_i^* = \left[1 + \left(\widehat{h}_{crit}^m\right)^2 / \sigma^2\right]^{-1/2} \left(x_{(i)} + \widehat{h}_{crit}^m \varepsilon_i\right)$$

Page 104 – line 2, "With the null of m modes"

5 Chapter 5

Page 122 – the rule of thumb bandwidth scale factor shoul be 0.588 and not 0.6306 (via Christoph Hanck)

Page 124 – Kneip is mispelled (via Christoph Hanck)

Page 125 – line 4, "In this case (as $h \to 0$), we see from" – in other words, this does not conflict with line 1 as we now focus on the local constant setting (via Christoph Hanck)

Page 128 – last line of Section 5.5, $n^{2/(4+q)(6+q)}$ (via Christoph Hanck)

Page 129 – line -3, $\overline{y} \approx 1$ (via Christoph Hanck)

Page 131 – line 4, "If it were equal to the inverse of the variance-covariance matrix of the errors (typically noted as Ω^{-1}), we have a" (via Christoph Hanck)

Page 137 – Equation 5.6 should have a tilde over the beta in the second set of parentheses

$$\min_h \sum_{i=1}^n \left[\widetilde{\beta}(x_i) - \widehat{\beta}_{-i}(x_i)\right]' \left[\widetilde{\beta}(x_i) - \widehat{\beta}_{-i}(x_i)\right]$$

Page 138, Section 5.10.2, Step 1 should read "$\overline{\widehat{u}}$ is the sample average of $\widehat{u}$" (via David Jacho-Chavez)

Page 141 – The R^2 measure should have sums of squares in the denominator

$$R^2 = \frac{\left[\sum_{i=1}^n (y_i - \overline{y})(\widehat{y}_i - \overline{y})\right]^2}{\sum_{i=1}^n (y_i - \overline{y})^2 \sum_{i=1}^n (\widehat{y}_i - \overline{y})^2}$$

Page 142 – Need square brackets on each ASPE measure as these are squared deviations

$$\begin{aligned} ASPE^1 &= n_2^{-1} \sum_{i=n_1+1}^{n} \left[y_i^* - \widehat{m}_{n_1}^1 \left(\mathbf{x}_i^* \right) \right]^2 \\ ASPE^2 &= n_2^{-1} \sum_{i=n_1+1}^{n} \left[y_i^* - \widehat{m}_{n_1}^2 \left(\mathbf{x}_i^* \right) \right]^2 \end{aligned}$$

Page 142 – line 1, "In step three the bandwidths" (via Christoph Hanck)
Page 146 – Table has missing and misplaced values

Table 1: Summary of elasticities and returns-to-scale from various parametric models.

6 Chapter 6

Page 164 – line -5 "data are homoskedastic (this leads to invalid standard errors in regression and a similar story holds here.)" (via Christoph Hanck)
Page 166 – line 2 below Equation 6.4 – "LCLS estimator of $\widehat{u}$ on $\mathbf{x}$" (via Christoph Hanck)
Page 167 – we were sloppy and wrote that the sample moment was equal to the population moment for the variance term $\widehat{\sigma}_n^2$ (via Christoph Hanck)
Page 168 – the line after the alternative hypothesis should read "on a set with positive measure" (via Christoph Hanck)

7 Chapter 7

Page 189 – line 1, $\{0, 1\}$, the Epanchnikov ($s = 1$) kernel, assuming a bandwidth equal to 1, would deliver the weights of 0 ($x_i = x$) and 0.75 ($x_i \neq x$)
Page 189 – Equation (7.1) should use ℓ as the kernel function instead of l (via Christoph Hanck)
Page 191 – line -2, "dth discrete covariate and" (via Christoph Hanck)
Page 198 – Section 5, should use ℓ as the kernel function instead of l (via Christoph Hanck)

8 Chapter 8

Page 208 – below Equation (8.2) – (via Christoph Hanck)

$$y_i \approx \left[1, \left(\mathbf{x}_i^c - \mathbf{x}^c \right) \right] \left[m\left(\mathbf{x} \right), \beta\left(\mathbf{x} \right)' \right]' + u_i$$

Page 210 – Section 8.8.2, should use ℓ as the kernel function instead of l (via Christoph Hanck)

9 Chapter 9

Page 233 – At the time of publication, we were unaware that this same function was previously proposed by Härdle, Liang and Gao (2000, pp. 26) in their book, *Partially Linear Models*.

10 Chapter 10

Page 275 – Equation (10.10) – (via Christoph Hanck)

$$CV(h_2) = \arg\min_{h_2} \frac{1}{n} \sum_{i=1}^{n} \left[y_i - \widehat{m}_{-i} \left(\mathbf{x}_i, \mathbf{z}_{1i} \right) \right]^2$$

Page 281 – Section 10.4 (excluding the material on page 282) and Section 10.4.1, should use boldface for z ($\mathbf{z}$) (via Christoph Hanck)

Page 281 – line -4, should state "so $m(\mathbf{x}, \mathbf{z}_1)$ is identified." (via Christoph Hanck)

11 Chapter 11

Page 295 – Equation 11.3 needs square brackets

$$\sum_{i=1}^{n} \sum_{t=1}^{T_i} \left[y_{it} - \widehat{m}(\mathbf{x}) - (\mathbf{x}_{it} - \mathbf{x}) \widehat{\beta}(\mathbf{x}) \right]^2 K_h(\mathbf{x}_{it}, \mathbf{x})$$

Page 298 – we failed to define σ_1^2 (via Christoph Hanck)

$$\sigma_1^2 = T\sigma_\mu^2 + \sigma_v^2$$

Page 298 – missing brackets on (via Christoph Hanck)

$$\mathcal{L}_i(\cdot) = \mathcal{L}\left[\mathbf{y}_i, m(\mathbf{x}_i) \right] = -\frac{1}{2} \left[\mathbf{y}_i - m(\mathbf{x}_i) \right]' V_i \left[\mathbf{y}_i - m(\mathbf{x}_i) \right]$$

$$m(\mathbf{x}_i) = \left[m(\mathbf{x}_{i1}), m(\mathbf{x}_{i2}), \ldots, m(\mathbf{x}_{iT}) \right]'$$

Page 312 – typo repeated in the definitions of $\widehat{I}_{nT}$ and $\widehat{\sigma}_{nT}^2$, each kernel function should be $K_h(\mathbf{x}_{it}, \mathbf{x}_{jt})$ (via Christoph Hanck)

12 Chapter 12

Page 332 – Equation 12.7 needs a subscript

$$D_2(p) = \sum_{i=1}^{n} (p_i - 1/n)^2$$

13 References

Fan and Ullah (1999) should not be their *Journal of Multivariate Analysis* paper, rather Fan and Ullah (1999) "On Goodness of Fit Tests for Weakly Dependent Processes Using Kernel Methods," *Journal of Nonparametric Statistics*, 11, 337-360

Ouyang, Li and Racine (2009) is published in *Econometric Theory*

14 Index

Page 364 – Maasoumi should not be listed on page 102 (via Essie Maasoumi)