ERRATA
Guillemin and Pollack, Differential Topology

p. 5 #4 \[ |x| < a \]
p. 6 #8 hyperboloid
p. 7 #18b \[ g(x) = f(x-a)f(b-x); \quad h(x) = \frac{\int_{-\infty}^{x} g(t) \, dt}{\int_{-\infty}^{\infty} g(t) \, dt} \]
p. 12 #8 hyperboloid, and delete the parentheses
p. 16 line 16 in \( f(X) \subset Y \)
p. 24 line 11 “In particular, taking \( X \) to be . . . ”
p. 25 #6 This is the definition of homogeneity of degree \( m \); 0 is the only possible critical value
p. 27 #11(a) Remark: This is really a special case of Exercise 6.
#13 Delete “of” at the end of the first line.
p. 28 line 9 \( g \circ f : U \to \mathbb{R}^\ell \)
p. 35 line 12 \( Z \) needs to be closed
p. 45 #6 simply connected
p. 48 #22 \( r_i = |x - x_i| \)
p. 51 line –9 \( g(x, \frac{1}{t}v) \)
p. 52 line –15 exercise 15
p. 55 #11 \( f^{-1}(a) \) should be \( \{ x \in X : F(x,v) = a \text{ for some } v \} \). The HINT should read as follows. Show first that \( F^{-1}(a) \) lies in a compact subset \( \{ (x,v) : |v| \leq \text{constant} \} \) of \( T(X) \): for if \( F(x_i, v_i) = a \) and \( |v_i| \to \infty \), pick a subsequence . . . . Now use the proof of the Stack of Records Theorem (p. 26, #7) to show that \( F^{-1}(a) \) is indeed finite.
p. 56 #15 \( A \) and \( B \) are disjoint, closed subsets.
p. 61 line 6 \( Z = \phi^{-1}(0) \)
line –6, –5, –3 \( dg_s \text{ and } d(\partial g)_s \text{ map to } \mathbb{R}^\ell \)
p. 62 line 1 \( \ker dg_s \text{ has dimension } k - \ell, \ker d(\partial g)_s \text{ has dimension } k - \ell - 1 \)
p. 64 #10 \( df_z(\hat{v}(z)) < 0 \)
p. 66 #4 \[ |x| < a \]
p. 70 line –10 \( S \to Y^\epsilon \)
p. 75 #7 affine subspace \( V \); the map given in the hint should be \( \mathbb{R}^k \times S \times \mathbb{R}^N \to \mathbb{R}^N \), defined by \( (t, v, a) \mapsto t \cdot v + a \)
#9 \( f : \mathbb{R}^k \to \mathbb{R} \)
p. 76 #18 \( X \subset T(X) \) refers to \( X \times \{ 0 \} \)
p. 83 #5 contractible; there still is a dimension 0 anomaly, so one should require \( \dim X > 0 \)
#6 contractible
p. 84 #9 \( I_2(f, Z) = 0, p \notin f(X) \cup Z \)
p. 85 #15 closed manifold \( C \)
#16 Consider the submanifold \( F^{-1}(\Delta) \)
Corollary to Exercises 18 and 19, obviously
Not so fast! To apply Exercise 8, we must use the fact that $X$
is a compact hypersurface to produce a ray intersecting $X$ (and
transversely).
$D_1$ is compact; “parametrization” in last line.

(b) nonzero normal vectors

What does it mean to define a manifold with boundary by indepen-
dent functions?

$X$ orientable and connected

\[ g(t + 2\pi) = g(t) + 2\pi q \]

“is” stable

$\bar{v}_1$ should have only nondegenerate zeroes inside $U$

In the last formula, $g^{ij}$, not $g_{ij}$, where $(g^{ij}) = (g_{ij})^{-1}$

the matrix $(g^{ij})$ is nonsingular

sum of the indices of $f$ at its critical points

The new map will only agree with $f$ on the complement of a slightly
larger ball, so it’s not quite an extension

$f(tx) = g_t(x)$

Replace $\rho$ with $\beta$, $b$ with $a$ in the last three lines

“Now apply the corollary of the special case” should be after the
right parenthesis

$\rho$ is not a submersion, but the rest is right

$(T^x)^{\sigma} = T^{x^{\sigma\pi}}$

$df_I = df_{i_1} \wedge \cdots \wedge df_{i_p}$

$X$ is a $k$-dimensional oriented manifold with boundary

$f_1 \circ h$, $f_2 \circ h$, $f_3 \circ h$

$\vec{F} = (f_1, f_2, f_3) \circ h$

The reference should be to Exercise 7

1, 2, 3 magically become (a), (b), (c)

The reference should be to Exercise 12

We need $Z_0$ and $Z_1$ oriented, and the definition of cobordism needs
to be updated to $\partial W = -Z_0 \times \{0\} \cup Z_1 \times \{1\}$.

$Y$ should be connected (cf. the proof on p. 191)

In the lemma, $X, Y$ should be compact, and $\int_S$ should be $\int_X$; in the
proof, $U$ should be a connected neighborhood of $y$

\[ \frac{x}{x+y} \, dy \]

last line: Identify $c$.

parallelepiped

Delete the $\frac{1}{2}$ before the Hessian matrix