Lecture Notes on Nonlinear Systems and Control
(Typos / Clarification Sheet)

This is a list of known typographical errors as well as further clarifications
that were required during the lectures. If you find more typographical errors
as you go through the notes, please let us know.

Chapter 2

p. 29, Example 1.13: We consider the system

\[
\begin{align*}
\dot{x}_1 &= x_2 \\
\dot{x}_2 &= -x_1 + (\mu - x_1^2)x_2
\end{align*}
\]

We realize that

\[
\lambda_{1,2} = 0.5\mu \pm \sqrt{0.25\mu^2 - 1}.
\]

It is easily checked that $Re(\lambda_{1,2})$ become zero at $\mu = 0$, and that for
$\mu \in (-2; 2)$, the derivative $\frac{d}{d\mu}Re(\lambda_{1,2}) = 0.5 > 0$. Thus, we expect
that as the parameter $\mu$ goes from negative to positive values, that
a stable limit cycle appears and that it surrounds the now unstable
equilibrium point, starting from $\mu > \mu_c = 0$. In the next three figures
we depict the behavior of the system as $\mu$ goes from a negative to a
positive value.

Chapter 3

p. 51, last part of the proof:

\[
V(t) = V(0) + \int_0^t \dot{V}(x(\tau))d\tau \leq V(0) - \gamma t
\]

p. 70, second equation:

\[
\dot{V}_2(x_2, u) \leq ...
\]
Chapter 4

p. 85, second line after equation (4.15): Hence the system is strictly passive, ...

Chapter 5

p. 101, equation (5.19): The matrices $A$ and $B$ are given by $A = \begin{bmatrix} A & 0 \\ C & 0 \end{bmatrix}$

and $B = \begin{bmatrix} B \\ 0 \end{bmatrix}$, respectively.

p. 102, equation (5.26): the center element in the matrix is given by: $-b - ck^2$

p. 105, Remark 5.6: We can extend ...