

Corrigenda for “Enriching the Art of FIR Filter Design ...”

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In the production of the published version of the paper

Timothy N. Davidson,
“Enriching the Art of FIR Filter Design via Convex Optimization”,
IEEE Signal Processing Magazine,
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a few of my corrections to the galley proof were implemented inaccurately. Fortunately, most of these errors are fairly easy to spot, but some of them have the potential to be confusing. For that reason I have provided corrections below. (I have also updated the status of reference [71].) If you spot any errors that are not on this list, or if there are places at which the exposition could be improved, please let me know.

For convenience, an annotated version of the published paper in which the errors are highlighted is available on my web page for this paper:

http://www.ece.mcmaster.ca/~davidson/pubs/Enriching_filter_design.html

Updates to this corrigenda will also be available there.

Typographical errors

These have been marked in red in the annotated version of the published paper.

- **Equation between (22b) and (22c):** The right hand side of this inequality should be $-U_p$, not U_p . Also, the end points of the interval on which this constraint is applied should be excluded. The correct equation is:

$$\tilde{\mathbf{v}}(\omega)^T \tilde{\mathbf{h}} \geq -U_p \quad \text{for all } \omega \in (\omega_p, \omega_s)$$

- **Equation (23b):** The left hand side of this inequality should be $-(C_p + \gamma)$, not $C_p + \gamma$. The correct equation is:

$$-(C_p + \gamma) \leq \tilde{\mathbf{v}}(\omega)^T \tilde{\mathbf{h}} \leq C_p + \gamma \quad \text{for all } \omega \in (\omega_p, \omega_s) \quad (23b)$$

- **Line after (24):** The lower bound on $\tilde{\mathbf{v}}(\omega)^T \tilde{\mathbf{h}}$ on this line should be $-\check{C}_p \gamma$, not \check{C}_p / γ .
- **Equation between (25b) and (25c):** The right hand side of this inequality should be $-U_p$, not U_p , and the right hand limit on the interval should be γ , not ω_s . Also, the end points of the interval should be excluded. The correct equation is:

$$\tilde{\mathbf{v}}(\omega)^T \tilde{\mathbf{h}} \geq -U_p \quad \text{for all } \omega \in (\omega_p, \gamma)$$

- **Figure 3:** In the label on the vertical axis, the lower case k should be replaced by an upper case K .
- **Page 100, left column, second last line:** The word “as” should be ignored.

Awkward exposition

These places have been marked in yellow in the annotated version of the published paper.

- **Equation (20):** This equation would have been easier to parse if I had adjusted the size of some of the delimiters. Here's a version that is a little easier on the eyes.

$$\max_{\omega \in \mathcal{W}} W(\omega) \left| 20 \log_{10}(|D(e^{j\omega})|) - 20 \log_{10}(|H(e^{j\omega})|) \right|. \quad (20)$$

- **Figure 3, caption:** I was not my intention to have the filter descriptions and the plot symbols interleaved in this way, but at least the relevant information is there.
- **Page 97, right column, Matlab code:** Unfortunately, in the production process the comments in this code were stripped out. A commented version is available on my web page for this paper.
- **References [14]–[17]:** These references are presented in a somewhat unusual format, but all the relevant information is there.

Updated reference

The paper cited as reference [71] has now appeared. The full reference is:

A. Jiang and H. K. Kwan, “Minimax design of IIR digital filters using iterative SOCP”, *IEEE Trans. Circuits Syst. I*, vol. 57, pp. 1326–1337, June 2010.