computation$_{g}raph.png$

[width=.6]computation$_{g}raph_{f}orward_{w}1.png$

graphicx
With:

$$
\begin{aligned}
f_1(1,2) &= 24521.662861313 \\
f_2(1,2) &= 2.73105857863 \\
f_1(1.01,2) &= 25200.8058793246 \\
f_2(1.01,2) &= 2.75302014923886 \\
f_1(1,2.01) &= 26411.9854338567 \\
f_2(1,2.01) &= 2.74105857863
\end{aligned}
$$

We have:

$$
\begin{aligned}
\frac{\partial \vec{f}}{\partial \vec{w}} &= \begin{bmatrix} \frac{f_1(1+\Delta,2)-f_1(1,2)}{\Delta} & \frac{f_1(1,2+\Delta)-f_1(1,2)}{\Delta} \\ \frac{f_2(1+\Delta,2)-f_2(1,2)}{\Delta} & \frac{f_2(1,2+\Delta)-f_2(1,2)}{\Delta} \end{bmatrix} \\
&= \begin{bmatrix} 67914.3018011622 & 189032.25725437 \\ 2.19615706088527 & 0.999999999999979 \end{bmatrix}
\end{aligned}
$$

Which in a more mathematical format give us:

$$
\frac{\partial \vec{f}}{\partial \vec{w}} = \begin{bmatrix} (\cos(e^{w_1}+e^{2w_2})+e^{e^{w_1}+e^{2w_2}})e^{w_1} & 2(\cos(e^{w_1}+e^{2w_2})+e^{e^{w_1}+e^{2w_2}})e^{2w_2} \\ \frac{e^{w_1}}{(1+e^{w_1})^2}+w_2 & w_1 \end{bmatrix}
$$

Which in a more mathematical format give us:

$$
\frac{\partial \vec{f}}{\partial \vec{w}} = \begin{bmatrix} (\cos(e^{w_1}+e^{2w_2})+e^{e^{w_1}+e^{2w_2}})e^{w_1} & 2(\cos(e^{w_1}+e^{2w_2})+e^{e^{w_1}+e^{2w_2}})e^{2w_2} \\ \frac{e^{w_1}}{(1+e^{w_1})^2}+w_2 & w_1 \end{bmatrix}
$$

Sure!

[width=.6]computation$_{g}raph_{f}orward_{w}2.png$

[width=.6]computation$_graph_backward.png$