Identifying Hand Hygiene Using Neural Networks

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My Data

My project works with wrist acceleration data, taken from what are essentially custom Fitbits. Healthcare workers washed their hands, tied their shoes, walked around normally, and performed other activities, and the wrist acceleration was captured at 100 Hz.

$$\begin{bmatrix} x_1 & x_2 & ... & x_n \\ x_{n+1} & x_{n+2} & ... & x_{2*n} \\ \vdots & & \ddots & \end{bmatrix}$$
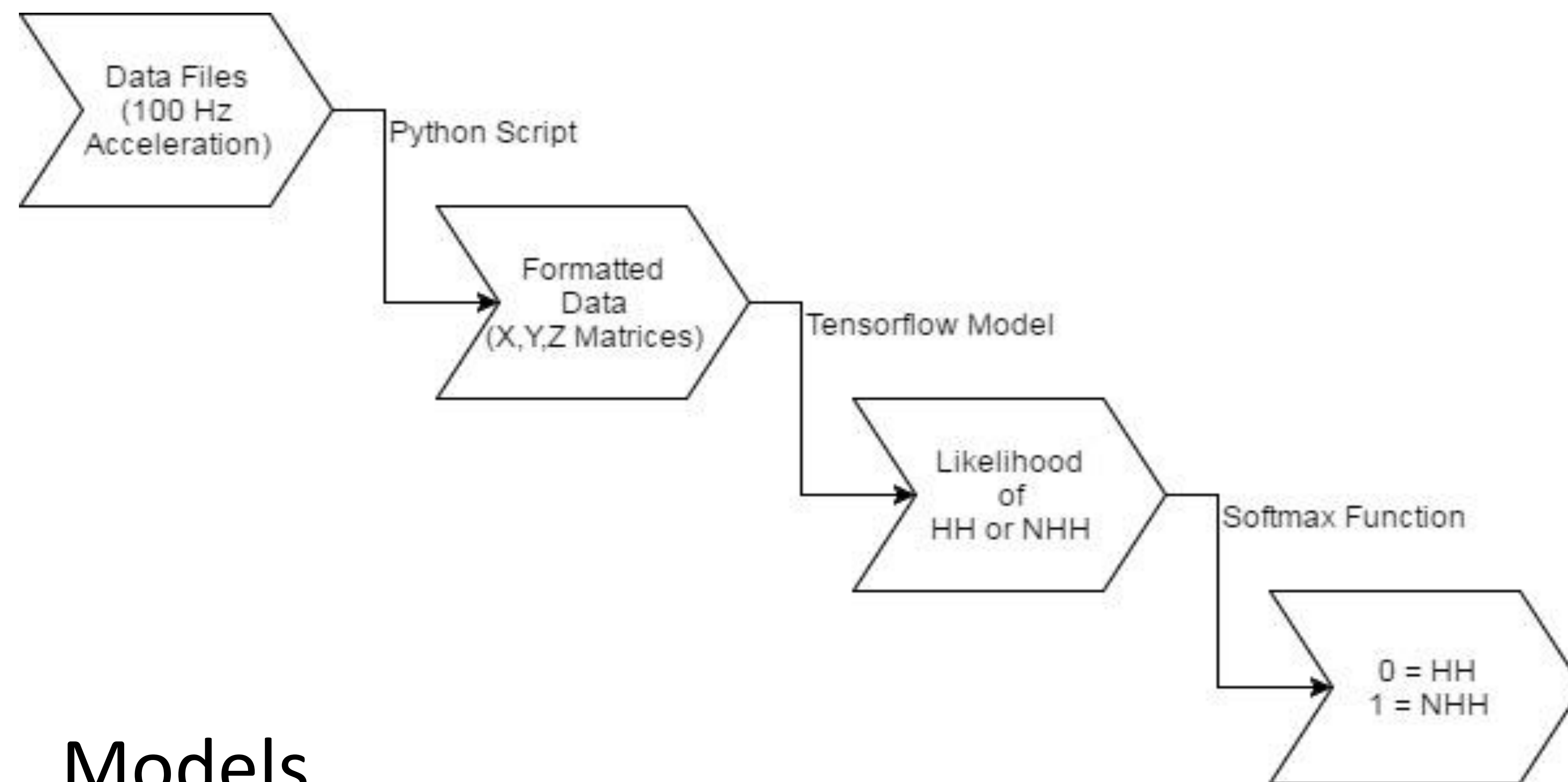
Deep Learning Basics

The object of deep learning is to model complex systems by a series of matrix multiplications.
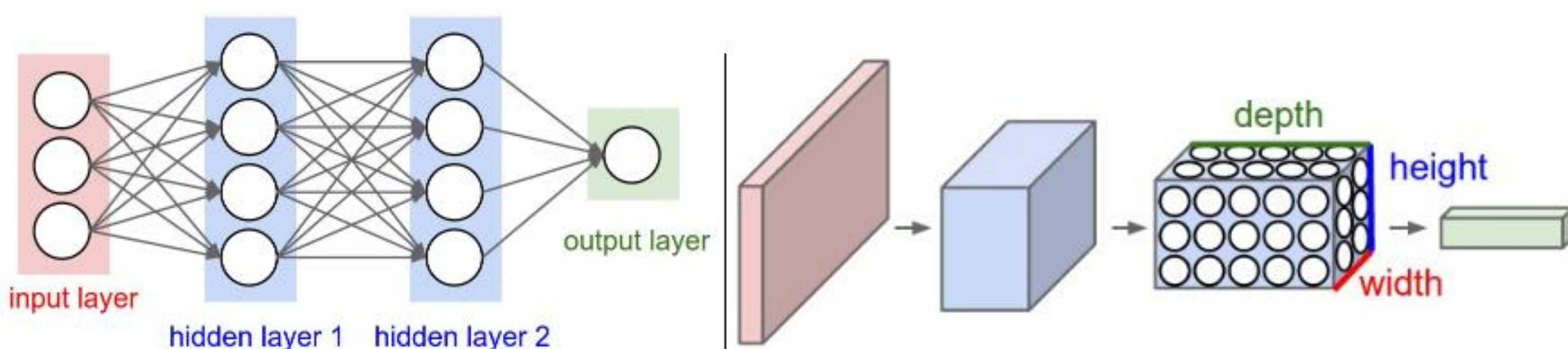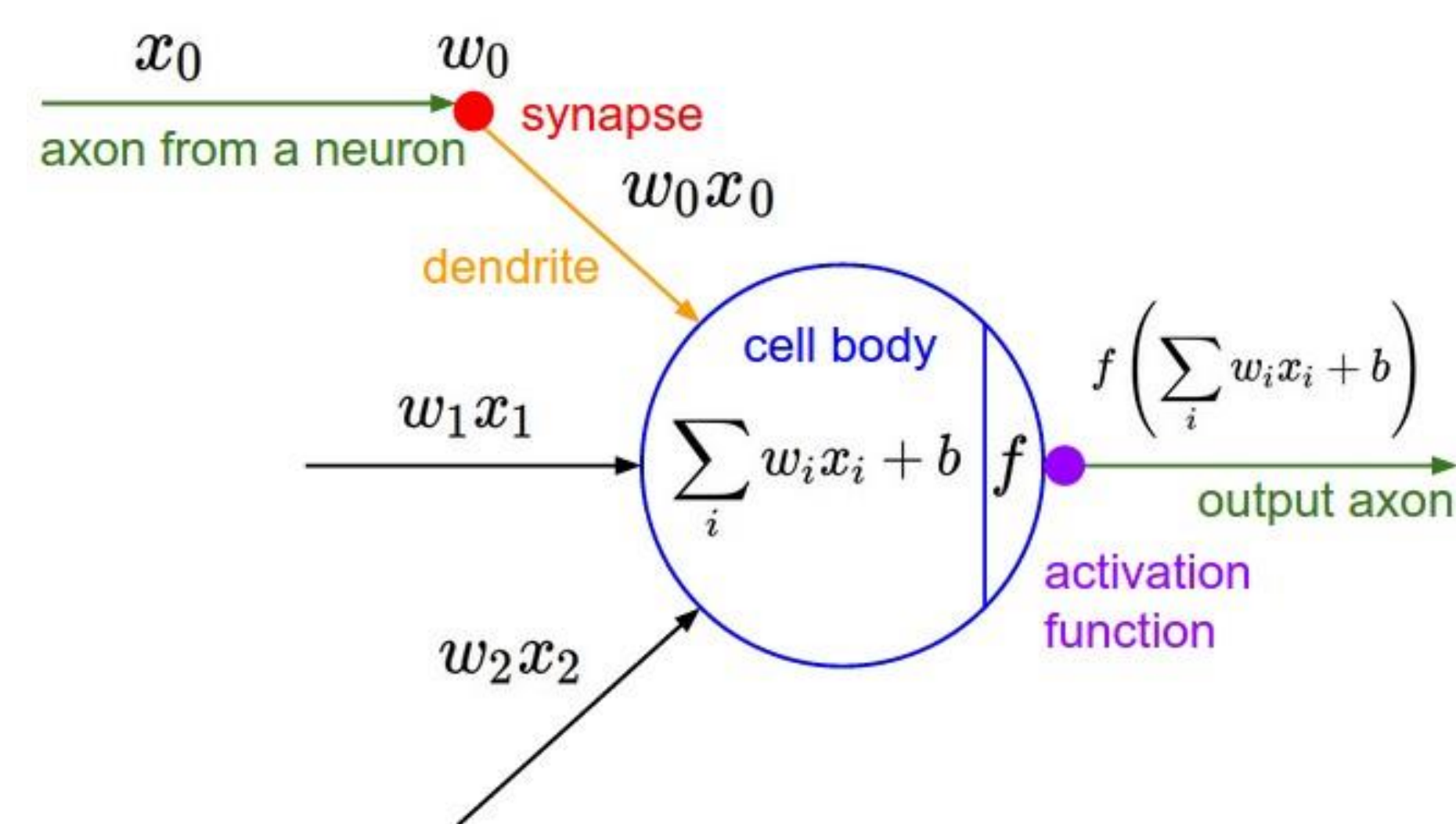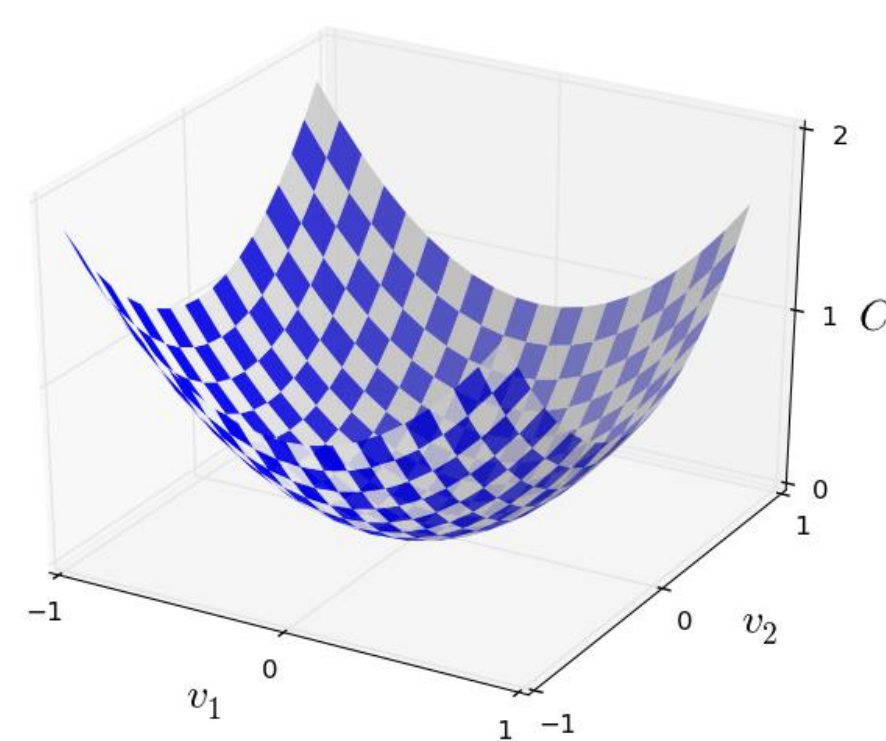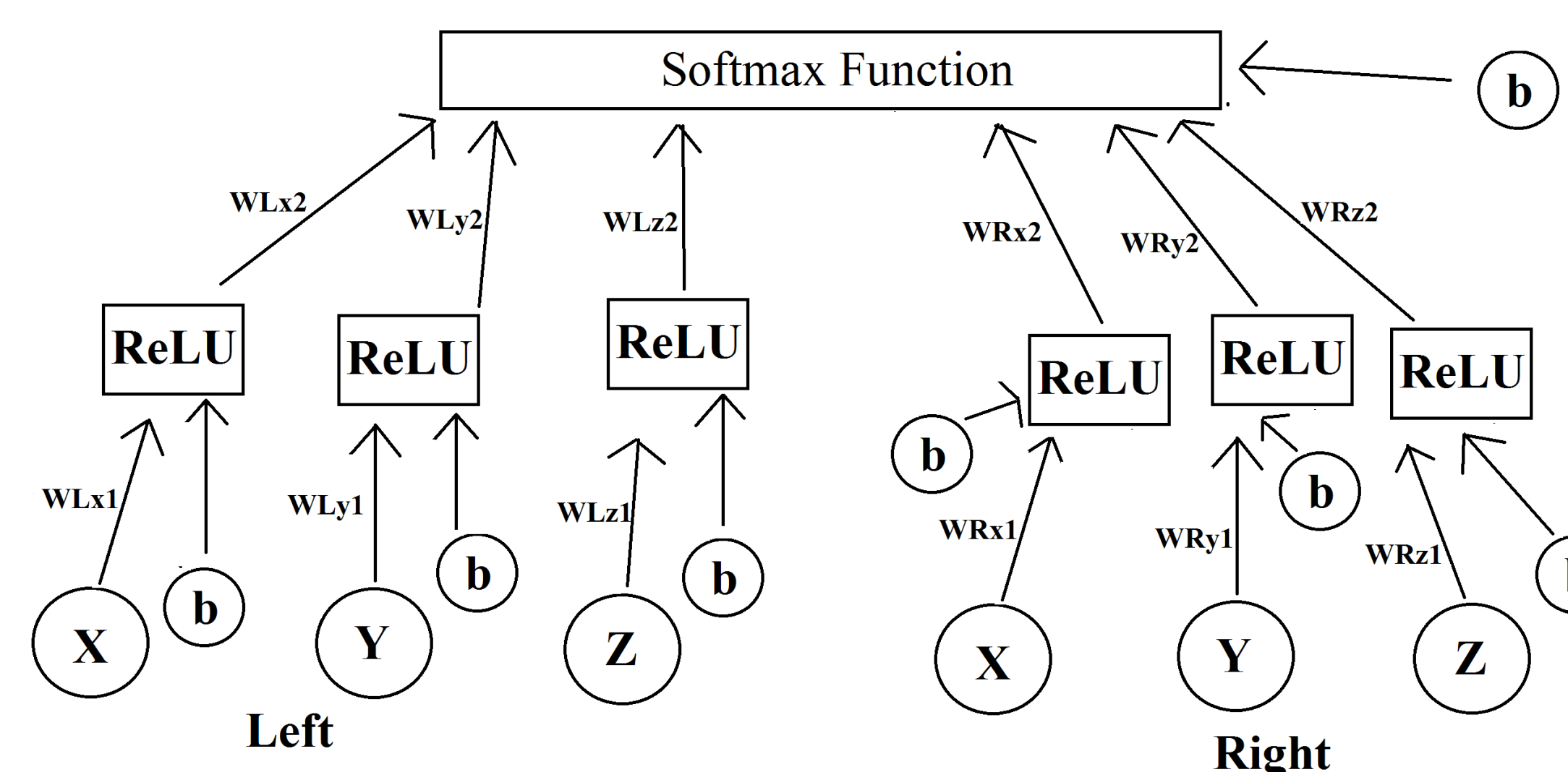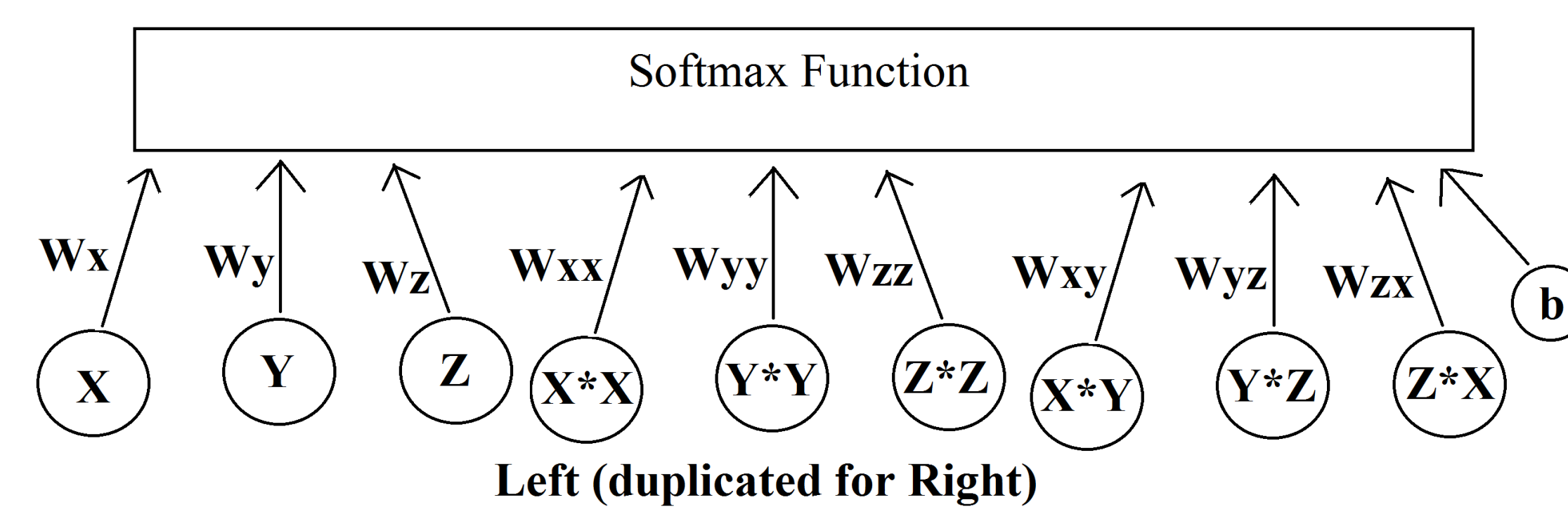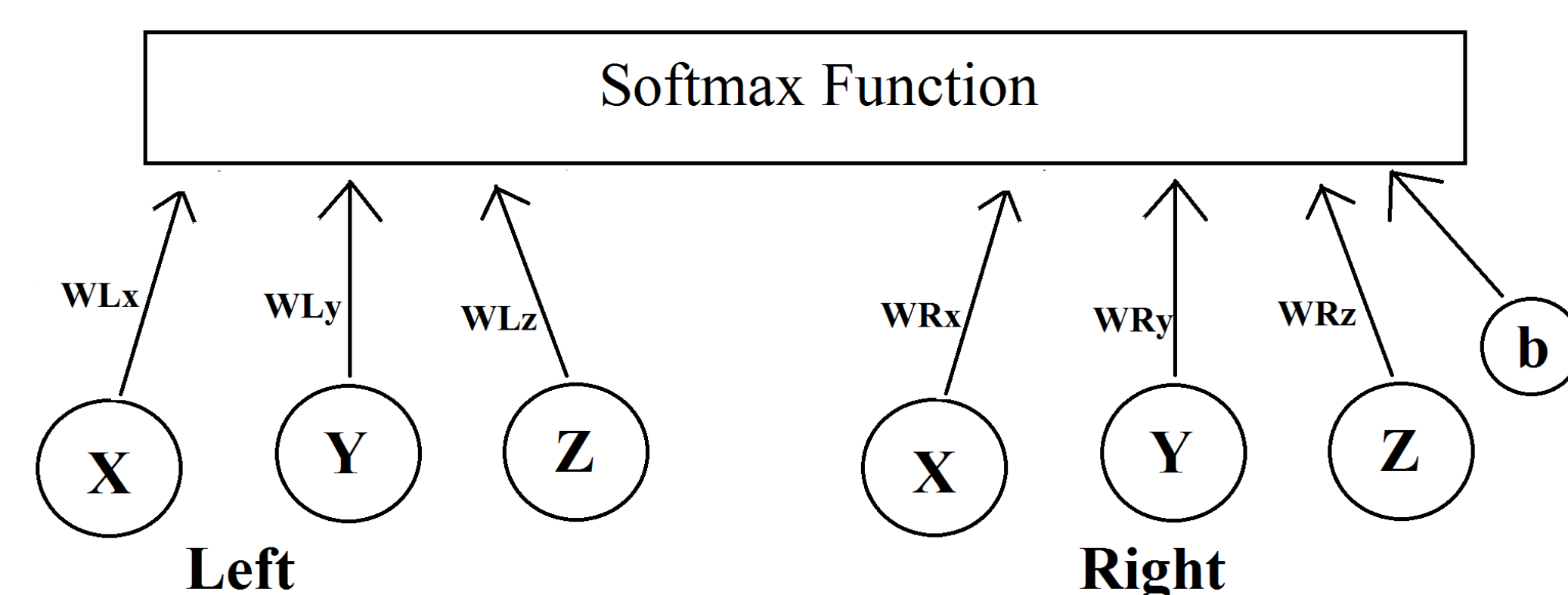

Pipeline

The final product of my project is to have a Python program which is given a file of time-stamped wrist acceleration data and outputs a list of times corresponding to when the system judges that the user is washing his or her hands.
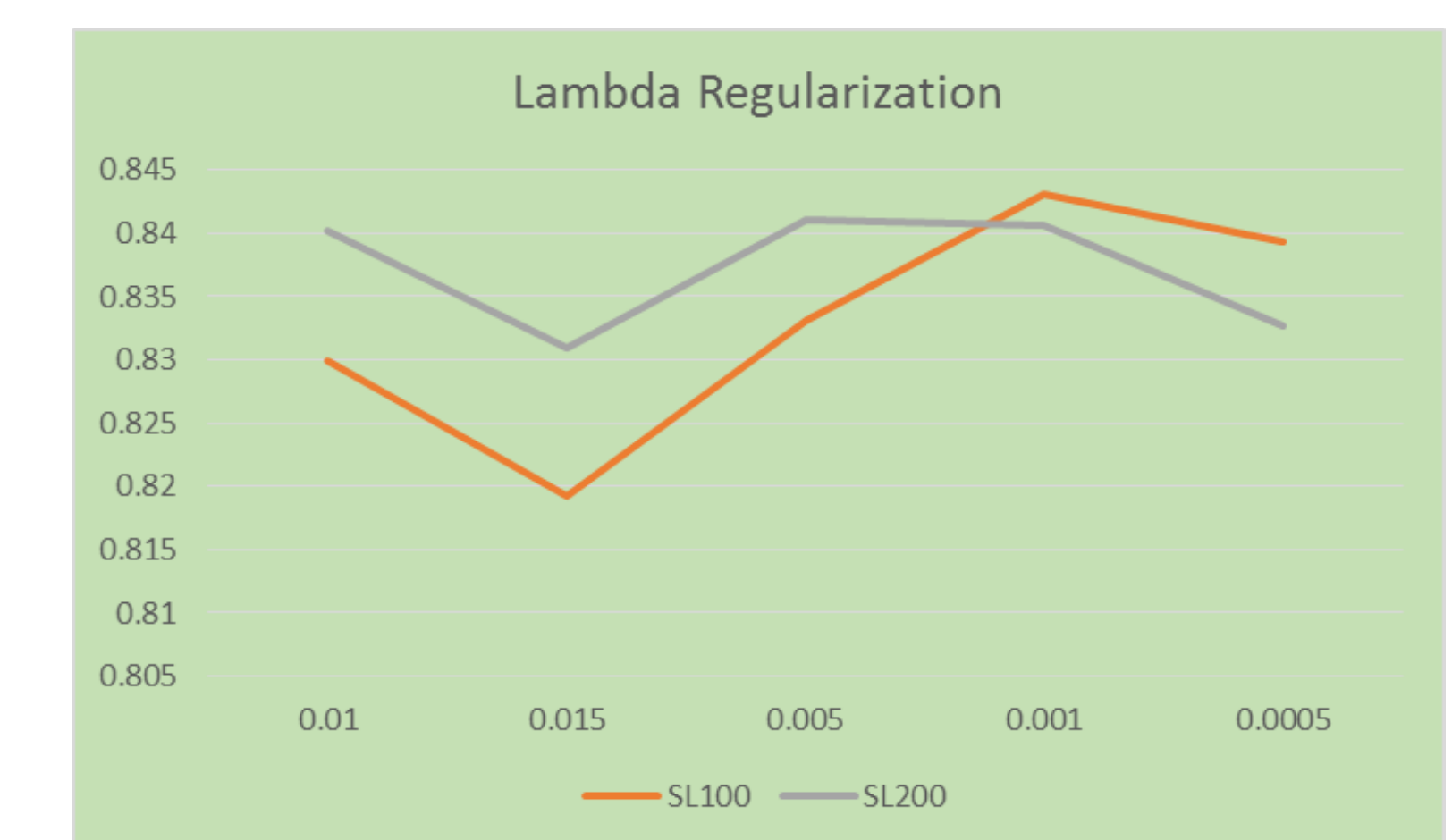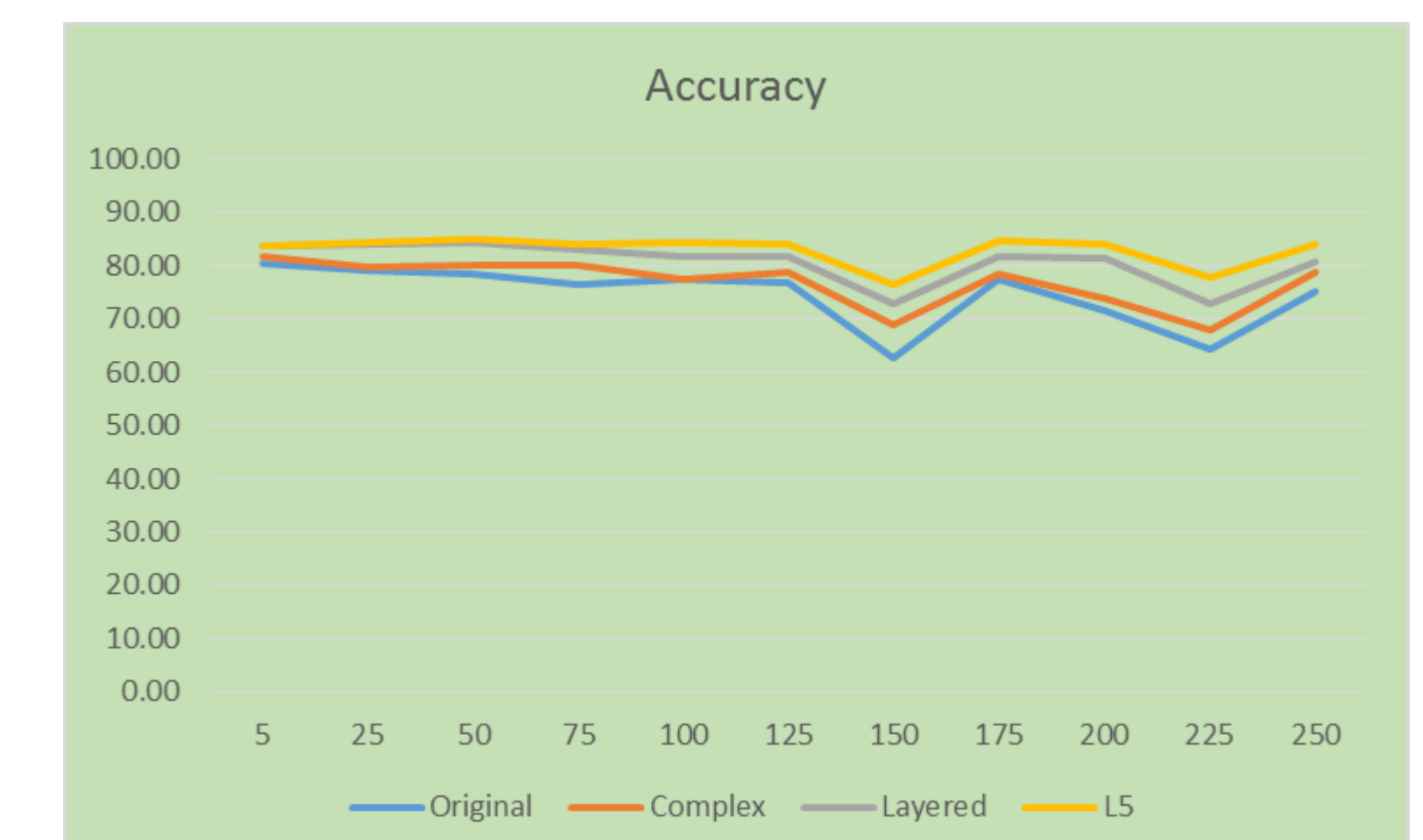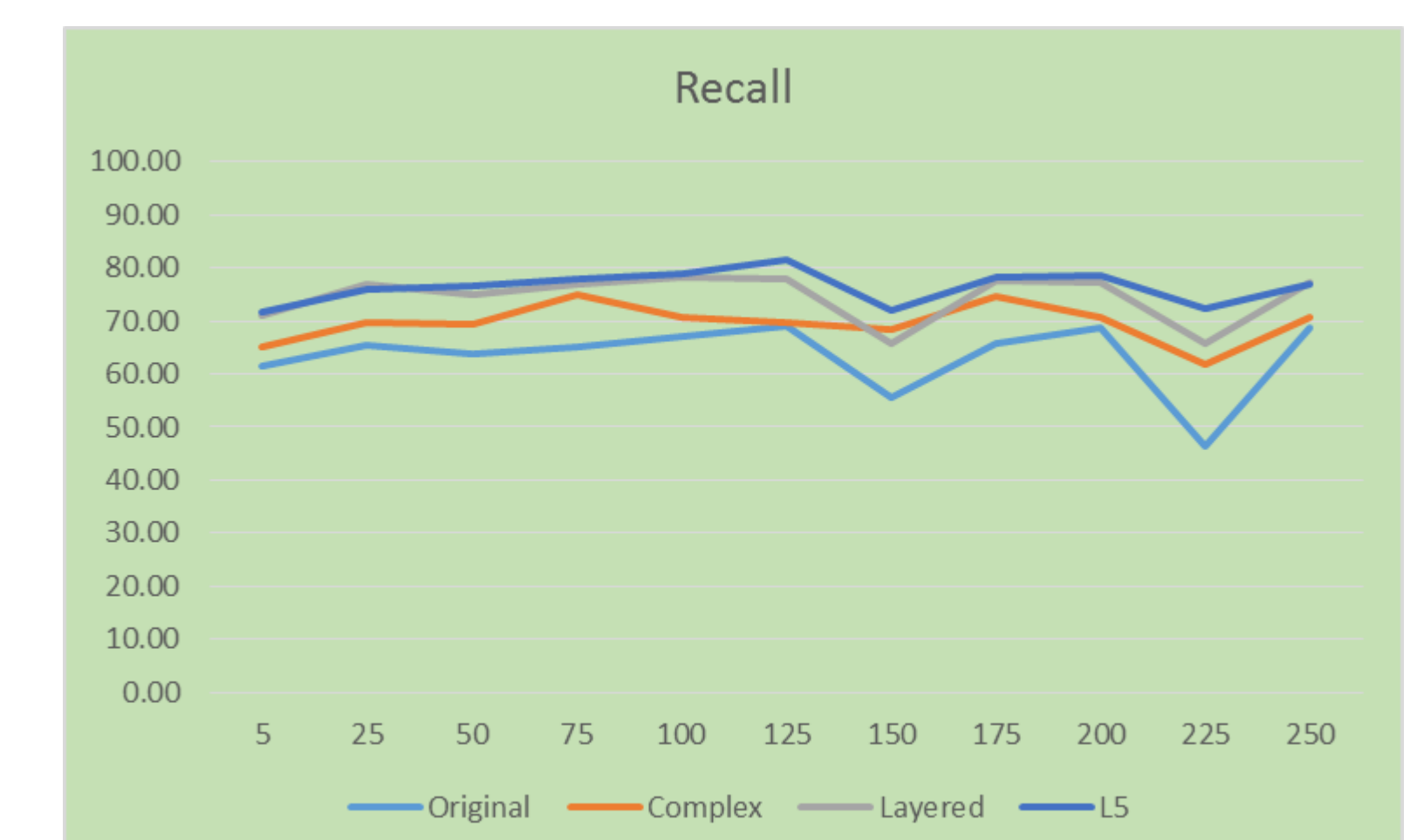

Models

Results

Overall a shorter window length produced better results. This idea makes sense because longer window lengths may miss certain periodic motions of hand hygiene.

Selected References

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