**Important parts taken from the appendix:**

* It should be noted, that in most cases the measurements on the output are disturbed by noise n. -> but this will not be considered here.
* Furthermore, in the following, the term Training Set(TS) is used to characterize the measurement data that is utilized to carry out the presented identification steps. A TS$\_\mathcal{D}$ consists of $N$ input-output pairs such that

\begin{equation}

\label{training set}

\mathcal{D} = \{u\_i , y\_i\}\_{i = 1,2, ..., N}.

\end{equation}

* In physical systems such as a WSS, the influence of the different variables is quite clear and the inputs can be chosen by the model equations which were presented in \secref{multi\_inlet\_multi\_WT\_model}.
* Furthermore, the choice of the input signal requires some prior knowledge about the operation of the system and the purpose of the model. For black box modelling, the measurement data is the only source of information. The behaviour of the real world system that is not represented in the TS, cannot be described in the model, unless prior knowledge is explicitly incorporated. Therefore, the TS needs to be as representative as possible in order to incorporate the desired operation of the real world system.
* It is important to note, that the WSS model presented in \chapref{system\_modelling} has been derived by first principles, however due to complexity of the system and the available data, the identification will be carried out by Black box identification and approximation methods. Also because some of the functions involved we only have implied existence of and hence do not know the exact structure. I.e. our problem with not having an analytic expression for q\_C. This relationship we know that exists, but cannot be easily derived from first principles.
* Mention LS -> introduce abbreviation.

**Deleted parts:**

\subsection{Determination of the weights}

\label{determination\_weights}

The determination of the weights $w\_i$ is treated as a LS problem. Using the notation of \figref{fig:nonlin\_block}, the error between the measured output data $y$ and the output of the model $\tilde{y}$ is used for the following loss function

\begin{equation}

\label{loss\_function}

L(w) = \frac{1}{2} e^Te.

\end{equation}

This is the simplest loss function which says that the loss is proportional to the square of the difference between the model and the process output.