Interactive comment on "Camera-based Water Stage and Discharge Prediction with Machine Learning" *by* Kenneth W. Chapman et al.

Anonymous Referee #1

The authors have presented a novel approach for estimation of river water stage and discharge by using camera data, processed through machine learning. This is a potentially useful approach and it may prove to be a viable alternative to the currently used approaches for filling data gaps. The calibration and validation results obtained by using various techniques such as ANN, SVR, etc. are also quite encouraging.

I have some observations from hydrology point-of-view. âĂć What are the extra benefits of using this approach vis-à-vis use of conventional hydrologic methods (such as time series analysis, hydrologic models, use of rating curve to convert river stage to discharge, etc.) of filling data gaps ? As noted, there may be data gaps due to several reasons including malfunctioning of sensors. Likewise, a camera may also malfunction at times. âĂć How this approach is likely to work for rivers with smooth/rough water

surface and the rivers with high sediment load/floating debris ? âĂć How useful will this approach be in night time ? Will it help if a flash device is used in the night time ? The applicability of the technique for the catchment with short response time will be limited if night time photos are not useful. âĂć Authors may please explain how this technique would work for wide rivers and for rivers where the flow passes through multiple channels whose dimensions that keep on evolving and changing ? âĂć âĂć Equation (B4), please add subscript 'i' to y-predicted