

# ***Interactive comment on* “Scalable Flood Level Trend Monitoring with Surveillance Cameras using a Deep Convolutional Neural Network” by Matthew Moy de Vitry et al.**

**Matthew Moy de Vitry et al.**

matthew.moydevitry@eawag.ch

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## **1 General reply to comments from Referee #1**

We thank Anonymous Referee #1 for the positive appraisal of the manuscript and valuable suggestions.

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## 2 Comment #1.1

*Given the target audience will primarily be hydrologists, I find the description of the methodology (particularly the software development and computational methodology) to be very complex and in-depth. I'm sure for some in the community this will be fairly easy language to interact with, but certainly to someone that doesn't design, code or work the tools such as this, I found much of the section passed straight over my head.*

Thank you for this notice. We are aware that this manuscript and the description is outside the discipline of pure hydrology. After considering moving the methodological details to the appendix, we are inclined to leave them in the main body of the article. The reason we find this appropriate is that the methodology presented forms the core novelty of the paper.

## 3 Comment #1.2

*The presentation of some of the figures are a little poor - while the matrix of images used to highlight how the model has been trained are undoubtedly a worthwhile addition to the paper, I definitely found them a little illegible due to their size - even zooming right in to the PDF rendered some of the images unclear as to what was going on. Furthermore, I originally elected to print a copy of the paper to review while travelling and the images do not translate to black and white or greyscale, perhaps highlighting an accessibility issue.*

Thank you for raising this point.

**Changes:** We will change Figure 4 to improve its readability: we are planning to move the three less interesting case studies to the appendix, so that the size of the images can be increased. Also, we will increase the image resolution to 600 dpi. Finally, we

will modify the colors so that the segmentation boundaries are clear.

#### 4 Comment #1.3

*Appreciating the author's comments about copyright and third party ownership of CCTV imagery, I do feel a specific case study may have aided the paper rather than just the catalogue of training videos presented in section 3.1. I understand this may not be an option for the authors, based on the nature of the copyright imagery they had access to, but it would have been useful to see an example using real data and images from an observed urban flood event.*

It is true that a specific case study of a real urban flood event would be beneficial to show the practical feasibility of the method proposed. Unfortunately, the possibility to collect such data would require a long-term study that was not within the means of the project. Nevertheless, other projects that aim to collect real flooding data could pick up this point. For example, the data collected in the ongoing Flood-Prepared project (link) might be a good candidate for such an applied study.

**Changes:** We will mention the need for a more in depth, practical case study of urban flooding in the discussion section of the manuscript.

#### 5 Comment #1.4

*Finally, I found the discussion section to be a little too focused on the technical aspects and challenges of the methodology. What would have been nice, was a slightly more "big picture" discussion that highlight the impacts and possible extensions of this work in an urban setting. Some of the findings here would be significant for urban drainage managers, infrastructure managers (particularly transport etc), quantifying economic*

*risks associated via damage etc and future policy creation around climate change scenarios and drainage dimensions. I acknowledge the authors touched on some of these issues in the introductory section, but it would have been a nice conclusion to the paper to discuss how some of their results may help remove some of the challenges that they identified in the introduction.*

Thank you for this suggestion.

**Changes:** In the conclusions section of the manuscript, we will elaborate on the advances that the proposed method could make possible. We will do this at the same “big-picture” level as the introduction.

## HESSD

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