exceeds 9. This is the main reason for choosing word length of coefficients.

After applying the proposed approximation, we modified the original algorithm in a hardware-friendly way and made it possible to exploit data parallelism at implementation below. Fig 6 shows two weight masks for different pixels in the Tsukuba image. In most cases, our approximation mask is very similar to the original mask. In all masks, pixels assigned high weights close to the center in terms of both photometric and geometric distance. It results disparity maps of similar quality.

To illustrate the effects of the support region size, Fig 7 plots the overall error rate of disparity maps generated by our modified AW algorithm. The following can be observed that, in general, the error rate decrease as the regions get larger. This is reasonable as small support regions cannot be effectively distinguished. More importantly, the matching quality seems stable after increasing the support window size over a threshold. It means the parameter of region size is less sensitive for changes in real scenarios. This is mainly because the outliers in the larger support region may be excluded in the cost aggregation or may have very small weights. The necessary of large support region again confirms the requirement of algorithm approximation. In the following sections, we will show that our experimental results still has good performance in accuracy.