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Development of channel mismatch detection algorithm for stereoscopic video 12

***Abstract***

***Channel mismatch (the result of swapping left and right views) – one of the stereoscopic video artefacts, that can introduce major discomfort when viewing. Therefore, it is important to be able to detect and fix in proper time this artefact at the production stage. A novel channel mismatch detection method is presented in this work that has high accuracy in comparison with analogues. In addition to features, described in [5], convolutional neural networks were used to analyze views and corresponding disparity maps for presence of channel mismatch in the scene. A training set consisting of 113 thousand samples was prepared for convolutional neural networks training. Logistic regression and SVM models were trained on the resultant features and used for channel mismatch probability prediction. A test set was prepared and an experimental evaluation of the proposed method was performed.***

***Keywords: stereoscopic video, quality assessment, channel mismatch, machine learning, convolutional neural networks.***

***References***

***1. Knee M.* Getting machines to watch 3d for you / SMPTE Motion Imaging Journal. – 2012. – Т. 121. – №. 3. – С. 52-58.**

***2. Lee J., Jung C., Kim C., and Said A.* Content-based pseudoscopic view detection / Journal of Signal Processing Systems. – 2012. – Т. 68. – №. 2. – С. 261-271.**

***3. Shestov A., Voronov A., Vatolin D.* Detection of swapped views in stereo image / 22st GraphiCon International Conference on Computer Graphics and Vision. – 2012. – С. 23-27.**

***4. Bouchard J., Nazzar Y., and Clark J.J.* Half-occluded regions and detection of pseudoscopy / International Conference on 3D Vision (3DV). – 2015. – С. 215–223.**

1. ***Bokov A., Lavrushkin S., Erofeev M., Vatolin D., and Fedorov A.* Towards fully automatic channel mismatch detection and discomfort prediction in s3d video / International Conference on 3D Imaging (IC3D). – 2016. – С. 1-7.**
2. ***Simonyan K. et al.* Fast video super-resolution via classification / Proceedings of IEEE International Conference on Image Processing. – 2008. – С. 349-352.**
3. ***Egnal G., Wildes R.P.* Detecting binocular half-occlusions: Empirical comparisons of five approaches / IEEE Transactions on pattern analysis and machine intelligence. – 2002. – Т. 24. – №. 8. – С. 1127-1133.**
4. ***Min D., Choi S., Lu J., Ham B., Sohn K., and Do M.N.* Fast global image smoothing based on weighted least squares / IEEE Transactions on Image Processing. – 2014. – Т. 23. – №. 12. – С. 5638-5653.**
5. ***Ватолин Д.С., Лаврушкин С.В.* Исследование и предсказание заметности перепутанных ракурсов в стереовидео / Вестник Московского Университета, серия 15, Вычислительная Математика и Кибернетика. –2016. – № 4. – С. 40-46.**
6. ***Ioffe S., Szegedy C.* Batch Normalization: Accelerating Deep Network Training by Reducing Internal Covariate Shift / Proceedings of the 32nd International Conference on Machine Learning (ICML-15). – 2015. – С. 448-456.**