

Real-Time Augmentation of a Newspaper Using Computer Vision

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The following dissertation aims to augment an adapted newspaper using the combination of a projector and computer vision methods. The final aim is for video footage to be projected onto the newspaper and to appear as if it is printed on the newspaper, as seen on the Daily Prophet in the Harry Potter films. The projection should be correctly transformed to correct distortions.

The technical side of this dissertation is mostly related to augmented workstations, desks and textbooks which were introduced in the early 1990s. Most of these prototypes aimed to improve physical notes by digitizing them, which has now been accomplished through tablets. This dissertation is justified as an interesting application of computer science or computer vision. It can be used as a fun prototype to increase interest in the field or just to serve as entertainment for others.

The adapted newspaper is fitted with fiduciary marks for the system to detect. These marks must be identified and labelled as the system requires information for each of the four corners to transform the projection. Two different identification methods were completed each with their own limitations, namely the assumption method and the colour method. The colour method was designed to overcome limitations of the assumption method and is more complex, this has resulted in limitations of its own.

Both methods have the ability to correctly transform the projection into to the right location on the newspaper once the testing environment is ideal (especially for the colour method as it is very sensitive to the environment's lighting). Both methods also experience a lag when updating the projection which is presumably related to costly computation times of the required algorithms or a lag in the projector. Aside from this the application can still be used in a number of environments and can still offer entertainment for those using it.