

COPYRIGHT PROTECTION OF GRAPHICAL LEARNING MATERIALS USING STEGANOGRAPHIC TECHNIQUES

B. E. C. Fernando

Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka

In order to provide security for the graphical learning materials, a steganography based software system has been developed to copyright graphical materials. The scope of the project was to limit unauthorized use of images by providing easy to use software utility which can establish and also prove his / her authenticity for the work. This development was expected to provide an additional assurance for the teachers in distributing their work and making them freely available for students through electronic means without any hesitation or potential risk of others misusing the same. The steganographic software system developed could be divided in to two different operational units called copyright image phase and detect copyright phase. The system was developed based on the Least Significant Bit (LSB) algorithm and it was used for embedding the copyright data into any type of carrier image file and also to detect hidden data from the copyrighted or 'stegoed' image. This was implemented using C# language through the Microsoft .NET framework. The system was tested through different test cases to identify the limitations and built in errors that may occur during the execution of the program. The developed software system worked satisfactorily and was able to provide a facility to embed copyright information details into a graphical learning material. It worked properly for any standard type of carrier image file type and any type of copyright information file. The software was designed in a user friendly manner and to display error messages for several exceptions. The software developed provided protected images that could not be identified as visually different from the initial 'un-protected' images, thus adequately serving the purpose of using steganographic techniques. The developed software proved useful for authenticating graphical learning materials in a convenient manner, and therefore, could be expected to be useful in reducing unauthorized reproduction and re-use of such materials. The stand-alone system which was developed based on the original software could be used without installing the Microsoft .NET framework.