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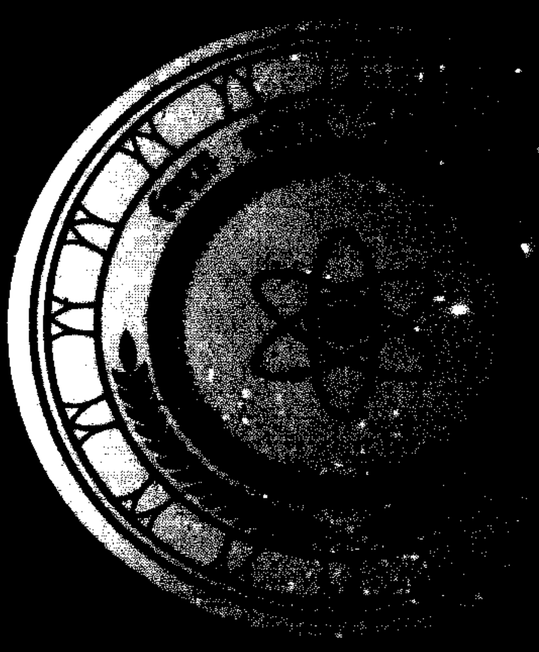

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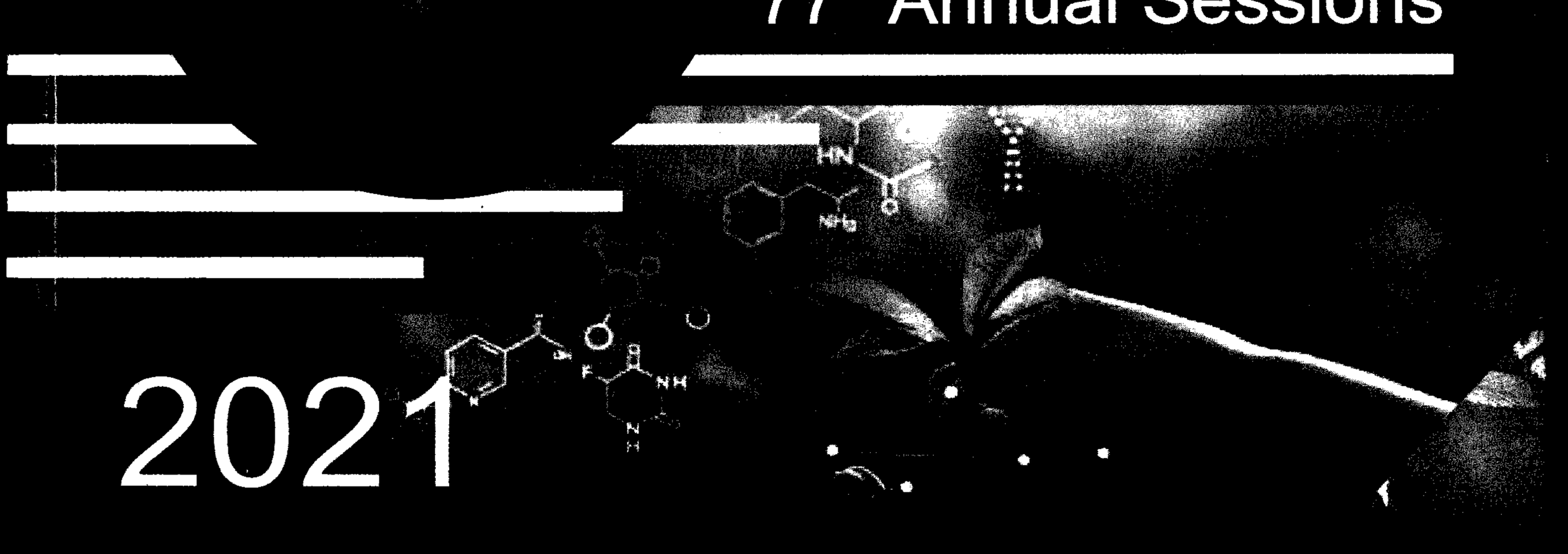

2021

I Part
Abstracts

Sri Lanka Association for the Advancement of Science – 2021

Proceedings of the 77th Annual Sessions

Part I – Abstracts

06 – 11 December, 2021

ISSN: 1391-023X

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2021 December

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This publication is sponsored by the National Science Foundation

701/E3

Towards an approach for the creation of digital archives for two-dimensional (2D) artefacts in Sri Lanka

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An archive creation of cultural heritage has become one of the crucial activities in society and creating digital archives for 2D artefacts has several issues. The objective of this research is to propose a novel approach to make digital archives of 2D mural paintings in Sri Lanka. By analysing a case study of digital archives of mural painting in a historical temple, Bellanwila Viharaya documented by Lal Hegoda, authors identified several issues related to the process of creating digital archives. Therefore, authors continued the literature review in the area of digitizing 2D images and identified that panoramic images which is an application of image stitching technique in computer vision can be applied to create digital archives. Panoramic image is the process of combining multiple photographic images with overlapping fields of view of a large mural painting which can not be focused as a single image. Authors researched on the 2D digital archive and identified software tools that are used for creating panoramic images. Two available software tools, Photoshop and Hugin were tested and identified some drawbacks. Accordingly, a new algorithm was proposed to create digital archives for 2D artefacts. New algorithm has several steps: image acquisition, pre-processing, sorting, feature detection and matching, homography, blending, fine-tuning and displaying output panorama. Large-scale 2D mural paintings in three main temples in Sri Lanka were used as the dataset to evaluate the proposed algorithm. A subjective evaluation of the experts in the area of visual arts was conducted for the dataset to determine the level of quality of 2D digital archive developed using the proposed algorithm comparing two available software tools. The collected data related to the quality attributes: colour balance, noise and distortion with the overall quality were analysed. It was identified that the percentage of higher-level overall quality of generated digital archives using the proposed algorithm is 92.86% and is higher than by using the other two software tools; Photoshop (35.71%) and Hugin (14.28%), respectively. Moreover, it can be concluded that the proposed approach is effective for creating digital archives and can be used to make a digital repository for 2D artefacts in Sri Lanka.

Keywords: Digital archive, two-dimensional artefacts, mural painting, image stitching, digital repository

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