Imaging the Syriac Galen Palimpsest: Preliminary analysis and future prospects
102v-107r_B - a Statistical Analysis

Siam Bhayro, University of Exeter
Peter E Pormann, University of Manchester
William Sellers, University of Manchester

The aim of this pilot study was to see to what extent additional information could be extracted from the 102v-107r_B set of multispectral images. The first step was to do a statistical analysis of the different wavelengths to see what the separation limit was from the data available. To do this a series of 200 points were sampled approximately uniformly across the page. 50 were chosen from un-inked parchment, 50 were from areas where only the overtext was written, 50 were from areas where only undertext was written, and 50 were from areas where it could be judged with reasonable certainty that there was both over- and undertext overlapping. The statistical analysis allowed us to perform Canonical Variate Analysis based image enhancement to maximise the contrast between the 4 regions. The results of this analysis, and subsequent imaging processing is illustrated in the following figures.

Figure 1. Graph showing the mean intensity (with 95% confidence intervals) of the 4 groups of manually identified points.

Figure 2. Graph showing how much variation is explained by the successive Canonical Variate axes.

Figure 3. Graph showing how the sample data plot on the first and second Canonical Variate axes.

Figure 4. Graph showing how the sample data plot on the second and third Canonical Variate axes.

Figure 5. The image derived from the first 3 Canonical Variate axes mapped to the red, green and blue colour channels. The full range of the data is mapped to 0-255.

Figure 6. The image derived from the first 3 Canonical Variate axes mapped to the red, green and blue colour channels. The range of the data encompassed by the manually sampled 200 points is mapped to 0-255.

Figure 7. The image derived from the first 3 Canonical Variate axes mapped to the red, green and blue colour channels. The 0.01 to 99.99 percentiles of the data are mapped to 0-255.

Figure 8. The image derived from the first 3 Canonical Variate axes mapped to the red, green and blue colour channels. The 0.1 to 99.9 percentiles of the data are mapped to 0-255.

Figure 9. The image derived from the first 3 Canonical Variate axes mapped to the red, green and blue colour channels. The 1 to 99 percentiles of the data are mapped to 0-255.

Figure 10. The image derived from the first 3 Canonical Variate axes mapped to the red, green and blue colour channels. The 5 to 95 percentiles of the data are mapped to 0-255.