



Image capture techniques for analysing text: IR and IS for the Dead Sea Scrolls

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with thanks to Greg Bearman and Pnina Shor





University of London





www.cch.kcl.ac.uk/research/projects/

Research projects

Projects by status Projects by funder

Projects by discipline area

Projects by partner institution

Contents

- Research projects in progress
- Second phase projects
- Completed research projects
- Embedded activities
- KVL projects

Research projects in progress

- Jane Austen's Fiction Manuscripts
- > British Printed Images to 1700
- Catalogue of English Literary Manuscripts 1450-1700
- > Chopin's First Editions Online
- > Centre for the History and Analysis of Recorded Music
- > Cultures of the Lusophone Black Atlantic
- > Corpus of Romanesque Sculpture in Britain and Ireland
- » Early Modern Spain
- Integrating Digital Papyrology
- Electronic Sawyer
- Fine Rolls of Henry III
- Greek Bible in Byzantine Judaism
- > Henslowe Alleyn Digitisation Project
- Inscriptions of Roman Cyrenaica

- London Theatre Bibliography
- > Modern World Poetry in English Translation
- Language of Landscape
- » Nineteenth-Century Serials Edition
- Paradox of Medieval Scotland
- Digital Schenker
- Sherpa DP2
- » Stellenbibliographie zum Parzival Wolframs von Eschenbach
- Swift project
- Pliny: A note manager
- » Regional Information Collection Centre
- TEI by example
- Digital Access Strategy for the John Murray Archive
- Desmond Tutu Digital Archive

Second phase projects

- > Clergy of the Church of England Database
- Corpus Vitrearum Medii Aevi
- Digital Image Archive of Medieval Music

- Online Chopin Variorum Edition
- > Prosopography of Anglo-Saxon England

Digital Image Archive of Medieval Music









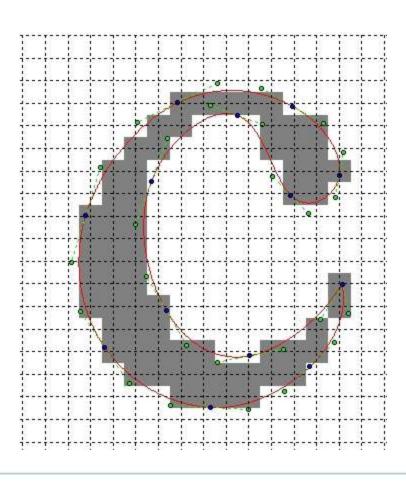
Some image analysis techniques for text

- Attenuating noise
- Vectorisation
- Kernel binarisation
- Page curl correction
- Character identification and segmentation





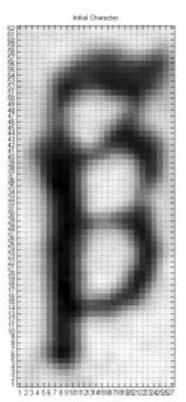
Third-order Bezier curves

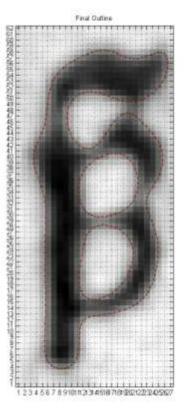






Outlining of Old Gothic character with third-order Bezier curves





H. Balk, IBM "Responding to the challenges in mass digitization of historical printed text", In *The IMPACT workshop at the*

EVA MINERVA Conf., Jerusalem, Israel, November 2008.

Imaging the Dead Sea Scrolls

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Q138	Phyl K			809	M1-4	43,452,453	41,364,365	Milik, DJD V1, pl. 2
Q139	Phyl L			211	M1-4	43.454,455	42.604,828,829	Milik, DJD VI. pl. 3
Q140	Phyl M				M1-4	43,450,451	42.828,829	Milik, DJD VI, pl.
Q141	Phyl N			212	M1-4	43.456,457	42.828,829	Milik, DJD VI, pl.
Q142	Phyl O			211	M1-4	43.454,455	42.828,829	Milik, DJD VI, pl
Q143	Phyl P			809	M1-4	43.452,453	41.364,465	Milik, DJD VI, pl.
Q144	Phyl Q			212	M1-4	43.456,457		Milik, DJD VI, pl
Q145	Phyl R			212	M1-4	43.456,457	42,448	Milik, DJD VI, pl
Q146	Phyl S			212	M1-4	43,457,461	42.448,828,829,43.828	Milik, DJD VI, p
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Dead Sea Scrolls: IAA benefits

- Support conservation and documentation
- Create high quality images:
 - colour
 - infra-red
 - multi-spectral
- Unify the IAA's rich digital resources
- Reflect the past, determine the future





Dead Sea Scrolls: Scholarly benefits

- Deliver the highest quality images ever seen by scholars of the DSS
- Provide interactive tools within a supportive research framework
- Integrate scholarly resources
 - Transcriptions, translations, bibliographies, indexes, maps, etc.
- Honour 60 years of scholarship, provide opportunities for future research perspectives



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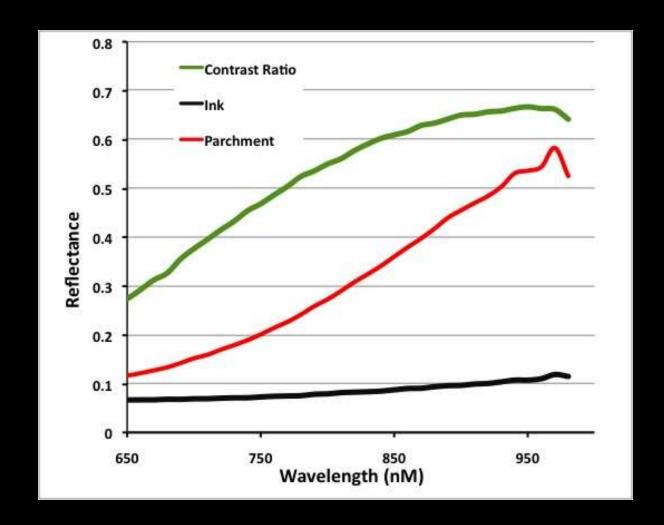
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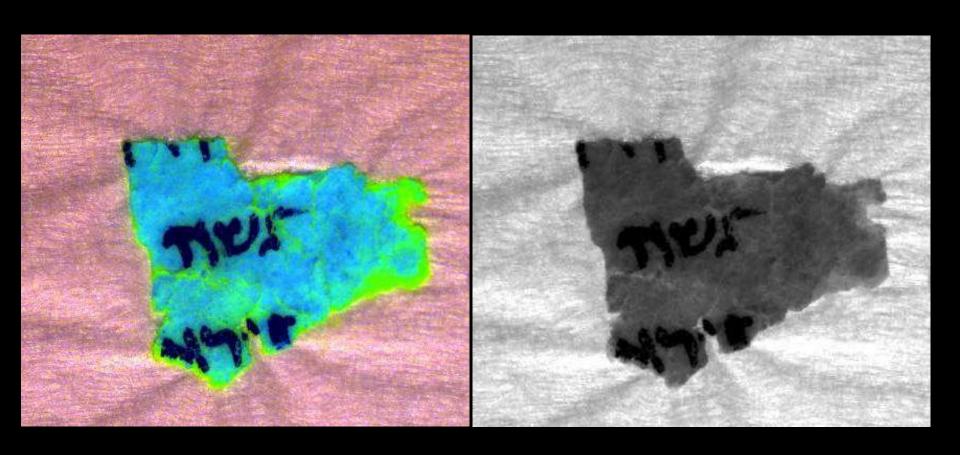
Imaging Spectroscopy for Scroll Conservation and Reading

- Monitor changes in scroll parchment condition that affect legibility before they become visible
- Combine with biomedical imaging technology (scrolls are on skin, after all) to map water content.
 Preliminary experiments with University of California-Irvine show feasibility
- Spectral classification may aid reading scrolls



Changes in reflectance spectrum in near infra-red are the major changes that affect legibility. These spectra are for a very dark fragment that is illegible with the human eye.

Spectral Classification



Use of complete spectrum separates ink, parchment, backing and background





Vision of the Digitisation Project of the Dead Sea Scrolls

The Israeli Antiquities Authority will digitise the Dead Sea Scrolls to protect the Scrolls for future generations whilst enabling all to be able to digitally view and research these artefacts of unrivalled value to world heritage

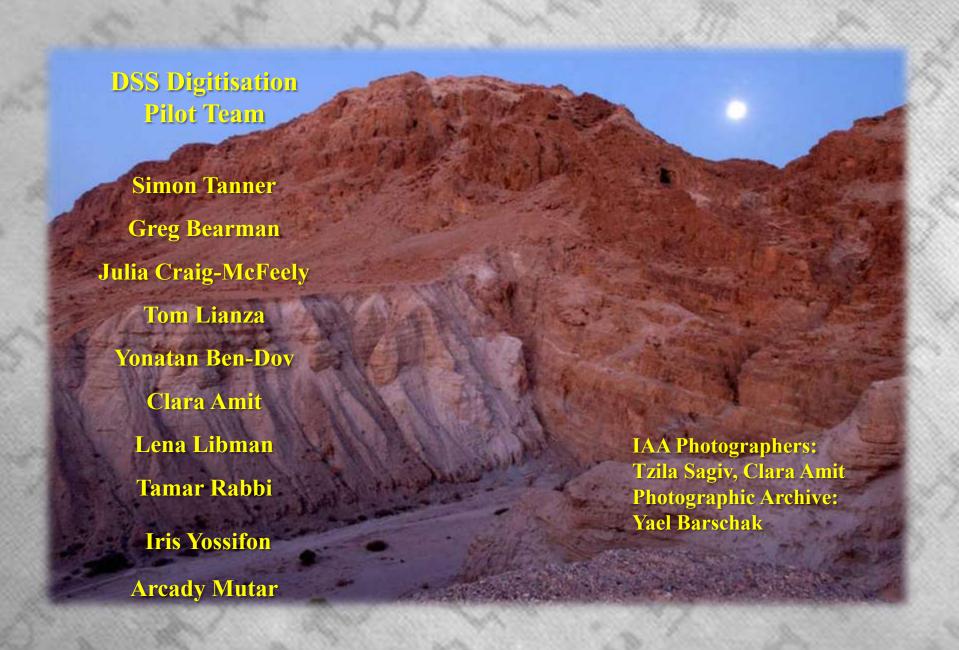






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