

Advanced Computational Tools for Qumran Scroll Research

Scripta Qumranica Electronica is the result of a five-year collaborative effort to fully integrate the high-resolution digital photographs of the Dead Sea Scrolls, imaged in recent years by the Israel Antiquities Authority, with the rich lexical database of the Qumranwörterbuch developed in Göttingen.

Qumranica provides a web-based working environment for scholars and the general public, with images and text shown side by side. Users can link regions of interest on images with segments of transcriptions. They can combine and adjust multiple images of a fragment (color, infrared, raking), and they can re-arrange virtual fragments on a digital canvas.

Tools and algorithms were designed to distinguish between the fragments appearing in a picture and the background in both old infrared images and the new multispectral ones, so users can manipulate virtual fragments without other artifacts. Algorithms have been developed to locate a fragment, based on a new image, among the many fragments in plates of fragments photographed at earlier dates and in different stages of deterioration, and to combine (register) old and new images. A pipeline has been designed to facilitate automatic alignment of transcriptions with images, involving layout analysis, line segmentation and imperfect automated text recognition, followed by algorithmic alignment, letter by letter, with the actual texts. Paleographic tools are also in development.

Qumranica is a joint project with Reinhard Kratz and Jonathan Ben-Dov. The main contributors to the development of the tools include: Taivanbat Badamdorj, Berat Barakat, Adiel Ben-Shalom, Bronson Brown-deVost, Gil Levi, Pinhas Nisnevitch, and Daniel Stökl Ben Ezra.