The Palaeographical Method under the Light of a Digital Approach

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Codicology and Palaeography in the Digital Age
Munich - July 2008
Background

University of Pisa

• 1990s Collaboration between Computer Sciences and History departments → to develop an application
• 1995-1996 First dissertation

University of Siena-Arezzo

• 2001-2005 Phd in Book and manuscript studies → to use the application on a palaeographical corpus
• Various articles published

University of Padova and King’s College London

• 2009 Collaboration to improve the application and make it available

No formal funding!
When palaeography meets the digital

• “Integral Palaeography” (Boyle 1984) and Interdisciplinary framework

• Digital palaeography approach
  – a methodology
  – (J)SPI software
  – corpus of manuscripts
  – practices and results of an approach (double-sided)

• Conclusions
(Agati 2003, translated)
Understand and support the Palaeographical method

“minute investigations of even trifling matters, to discover the traces of events that could not be directly experienced by the observer”

Intellectual operations

- Analyses
- Comparisons
- Classifications

(Carlo Ginzburg 1979)

Computational methodologies

Make explicit those processes of the palaeographical method which apply to detailed analyses of individual objects
SPI Relational Database
Palaeography of the Corpus (Siena)

Extreme of not formalised caroline minuscule: IX-X centuries

1st group: XI century

2nd group: XII first half

3rd group: XII second half

Extreme of incipient gotic script: XII ex – XIII in
An approach of Digital Palaeography

**Scanning and Image Pre-processing**

- resolution 300 dpi
- archival copy on cd-rom in TIFF
- experimentation on bitmap – folia introduced as sections, per column when possible
An approach of Digital Palaeography
Segmentation
An approach of Computational palaeography

- segmentation parameters tuned on the pattern typology (x projection)

- three abstract categories of letters
  - “unimodali” (eg. i and l)
  - “bimodali” (eg. b and st)
  - “trimodali” (eg. m and sti)
An approach of Digital Palaeography

Models Generation
An approach of Digital Palaeography
Models Interpretation
An approach of Digital Palaeography
An approach of Digital Palaeography
An approach of Digital Palaeography
An approach of Computational palaeography

New organisation of the corpus

Criteria and process of Digitisation

Tests of Classification

Features and feasibility Models

Criteria and process of Segmentation
An approach of Digital Palaeography

caroline of IX-X centuries

caroline *tipizzata* of XI ex / first half of XII century

caroline in imitation of Roman caroline of XI ex / third quarter of XII century (common characteristics with caroline of FIII3 and FIII13)

caroline with stylistic intermediate of XII med

caroline of beginning of canon of second quarter / half of XII century (common characteristics with caroline of FIII13)

“formed” caroline of second half of XII century (common characteristics with caroline of FIII13 and GVII12)

scripts of XII ex / XIII in (incipient Gothic, round script, Gothic script)
Palaeography of the Corpus (Siena)

- centrality of script
- material culture

‘integral palaeography’
Palaeography of the Corpus (Siena)

• patrimonial context

Monastery of S. Eugenio (Siena)

• integration of material culture studies and digital models
Methodology

From the morphological details to the material history

Comparison and measures

Morphological parameters

Segmentation

Modeling

Intermediate stages of reduction and formal analysis

Complexity of the manuscript

Base for interpretation
An approach of Digital Palaeography

Define a **Nomenclature**
To abstract from and reduce the “polyphony” of individual manuscripts

The role of **Images**
To abstract from and reduce the original morphology of letters
Methodology

Added value of the Models

To abstract and reduce the original morphology of letters → Creation of models/prototypes

- computation of features
- morphological characteristic expressed in quantitative terms (comparison)

- visible abstraction
  - model which incorporates the variants visually (in a perceivable way)
# Limits and Future

**SPI → JSPI**

<table>
<thead>
<tr>
<th></th>
<th>SPI</th>
<th>JSPI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Documentation</strong></td>
<td>Undocumented installation process;</td>
<td>Standard technologies</td>
</tr>
<tr>
<td></td>
<td>Dissertations, journal article, book essay</td>
<td>Handbook</td>
</tr>
<tr>
<td><strong>Transparency</strong></td>
<td>Ambiguous interface</td>
<td>More informative interface</td>
</tr>
<tr>
<td><strong>Standards, extensibility, interoperability</strong></td>
<td>Platform dependent</td>
<td>Platform independent; Standard programming languages and tools, free licences</td>
</tr>
<tr>
<td></td>
<td>Closed application</td>
<td>Extensible and to be made public</td>
</tr>
<tr>
<td></td>
<td>Desktop application</td>
<td>Towards network environment</td>
</tr>
</tbody>
</table>
# Limits and Future

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<thead>
<tr>
<th></th>
<th>SPI</th>
<th>JSPI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Segmentation</strong></td>
<td>Fixed grid of letters/ligatures</td>
<td>Extensible set of letters/ligatures</td>
</tr>
<tr>
<td></td>
<td>Best choice for automatic segmentation</td>
<td>Multiple choices available</td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>Italian</td>
<td>English</td>
</tr>
<tr>
<td></td>
<td>Minimal but complex</td>
<td>More user-friendly</td>
</tr>
</tbody>
</table>
Limits and Future
SPI → JSPI
Limits and Future
SPI → JSPI

- Image pre-processing and processing
- Export into standard format (e.g. TEI)
  - dates, descriptions etc.
  - connection between image and text
  - searches
- Refined search
- Derivation of conceptual model
Thank you!

Questions?
Comments?