Handwritten Text Recognition for Ancient Documents

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HTR for Ancient Documents

Problem: Off-line transcription of handwritten text images

Applications:

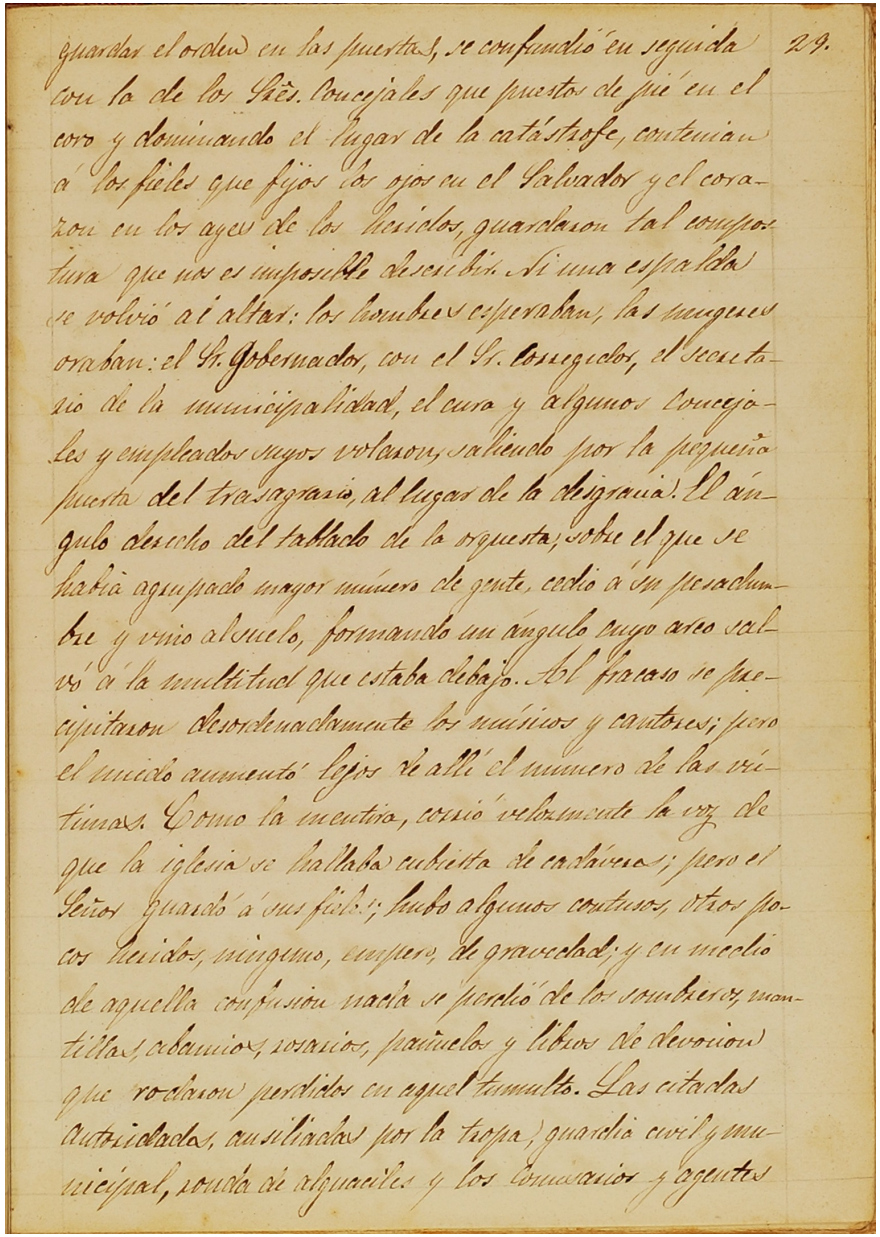
- Historical document collections residing in libraries, museums and archives
- Literary masterpieces

Approaches:

➢ OCR technologies are very far from offering useful solutions HTR

➢ Off-line HTR without any prior segmentation . . .

. . . but a Computer Assisted Interactive process



HTR Technology Overview

➢ **Document image preprocessing:**

- skew correction
- background removal
- noise reduction

➢ **Line image extraction:**

- slant correction
- non-linear size normalization

➢ **HMM training/decoding:**

- Lines represented as sequences of feature vectors
- Characters modeled by continuous density HMM
- Words modeled by stochastic finite-state automata
- Text lines modeled by using N-grams
- Baum-Welch algorithm for training
- Viterbi algorithm for decoding

MM-CATTI: MultiModal Interactive Transcription

Scenario: Totally correct transcriptions with minimal human effort

Approach: Multimodal Computer Assisted Transcription of Text Images

System:
- Interactive-predictive HTR
- Multimodal interfaces

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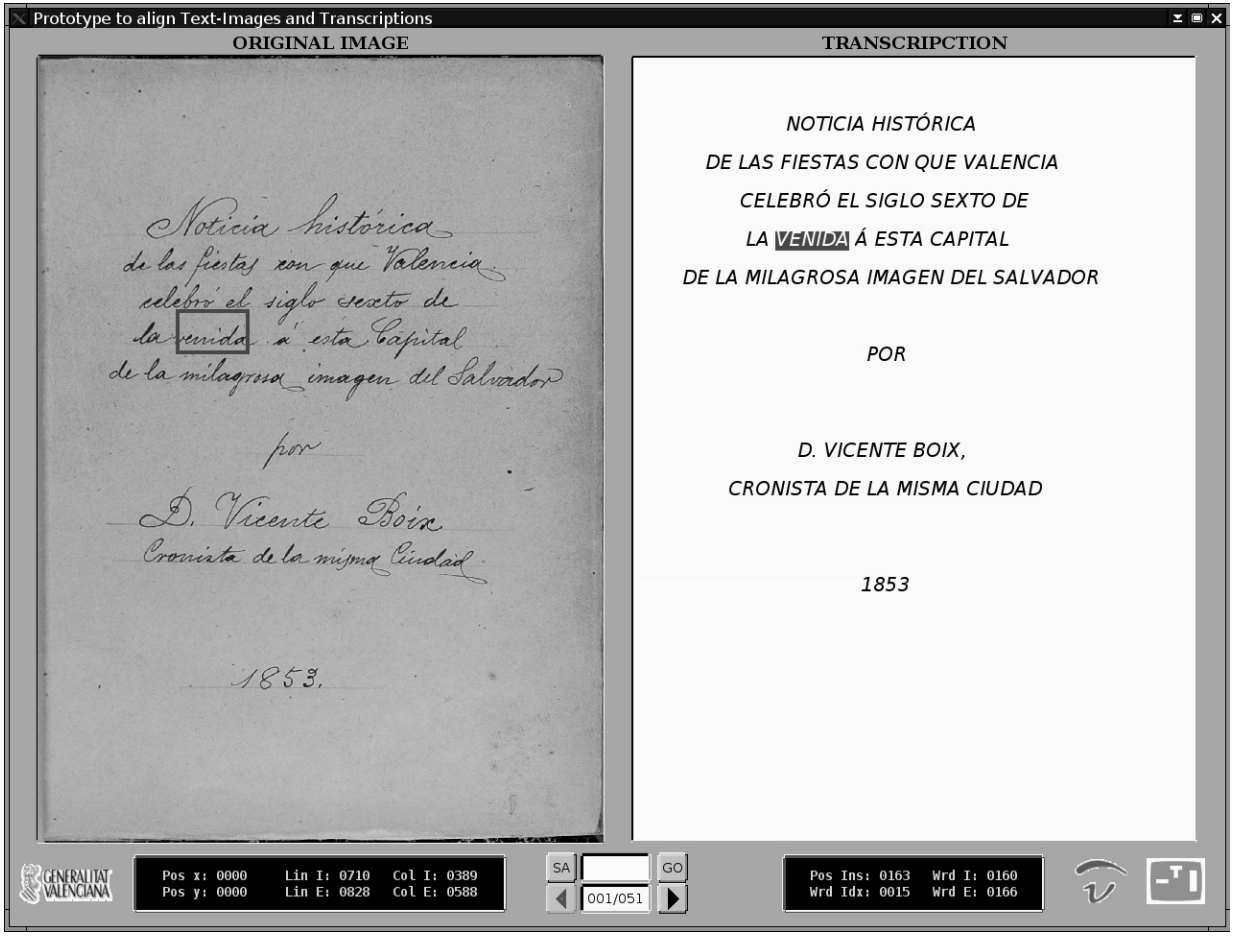
Aligning Text-Images and Transcriptions

Scenario: Handwritten text images and their proper transcriptions are available

Approach: Viterbi alignment based on HMM



GIMP-based Interactive Transcription Tool

Scenario: HTR applications in which obtaining perfect transcriptions is not mandatory

Approach: Train from partially supervised transcriptions

System:

- Interactive-predictive HTR built on top of the GIMP
- Constantly updated models with previously annotated documents
- Active Learning techniques for sample selection
- Maximum error allowed is specified in advance