USABILITY GAP

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NATIONAL LIBRARY OF MEDICINE

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DEPARTMENT OF HEALTH & HUMAN SERVICES · USA ·

WHO AM I?

http://archive.nlm.nih.gov/staff/antani.php

- Intramural researcher at National Library of Medicine, NIH
  - Content-Based Image Retrieval (Biomedical Images)
  - Multi-modal Image Retrieval
- Projects:
  - **SPIRS**: Spine Pathology Image Retrieval System
  - **SPIRS-IRMA**: Geographically Distributed CBIR
  - **CervigramFinder**: NCI Uterine Cervix Images
- Credentials (War Wounds):
  - CervigramFinder: Completed Congnitive Phase of Usability Evaluation
- Deserno TM, Antani S, Long R. Ontology of Gaps in Content-Based Image Retrieval. J Digital Imaging. February 2008

WHAT IS USABILITY?

… and why does it matter

COMMONLY UNDERSTOOD AS …

DIFFICULT TO USE = FAILURE

EASY TO USE = SUCCESS

Image sources: http://gamedesignreviews.blogspot.com/2006/09/lost-in-blue-game-design-and-usability.html
http://www.apple.com

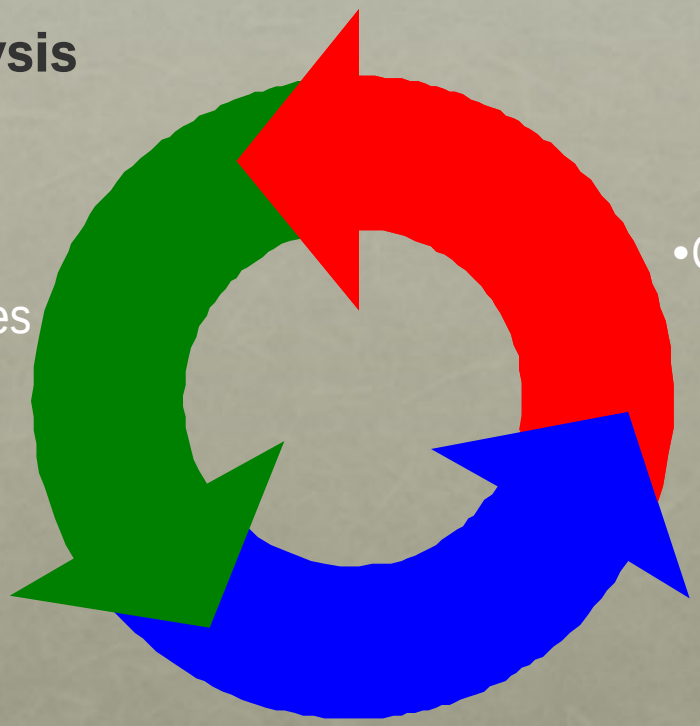
WHAT IS IT REALLY?

- Ease of use
- Comprehensible User Interface
- Functional “completeness”
- Clear system response
- Support for interactivity (user feedback)
- Clarity in error reporting

USER-CENTRIC DEVELOPMENT

Requirements Analysis

- Field studies
- User profiles
- Workflow & task analyses



Evaluation

- Inspection
- Heuristic Evaluation
- Cognitive Walkthrough
- Usability testing

Design

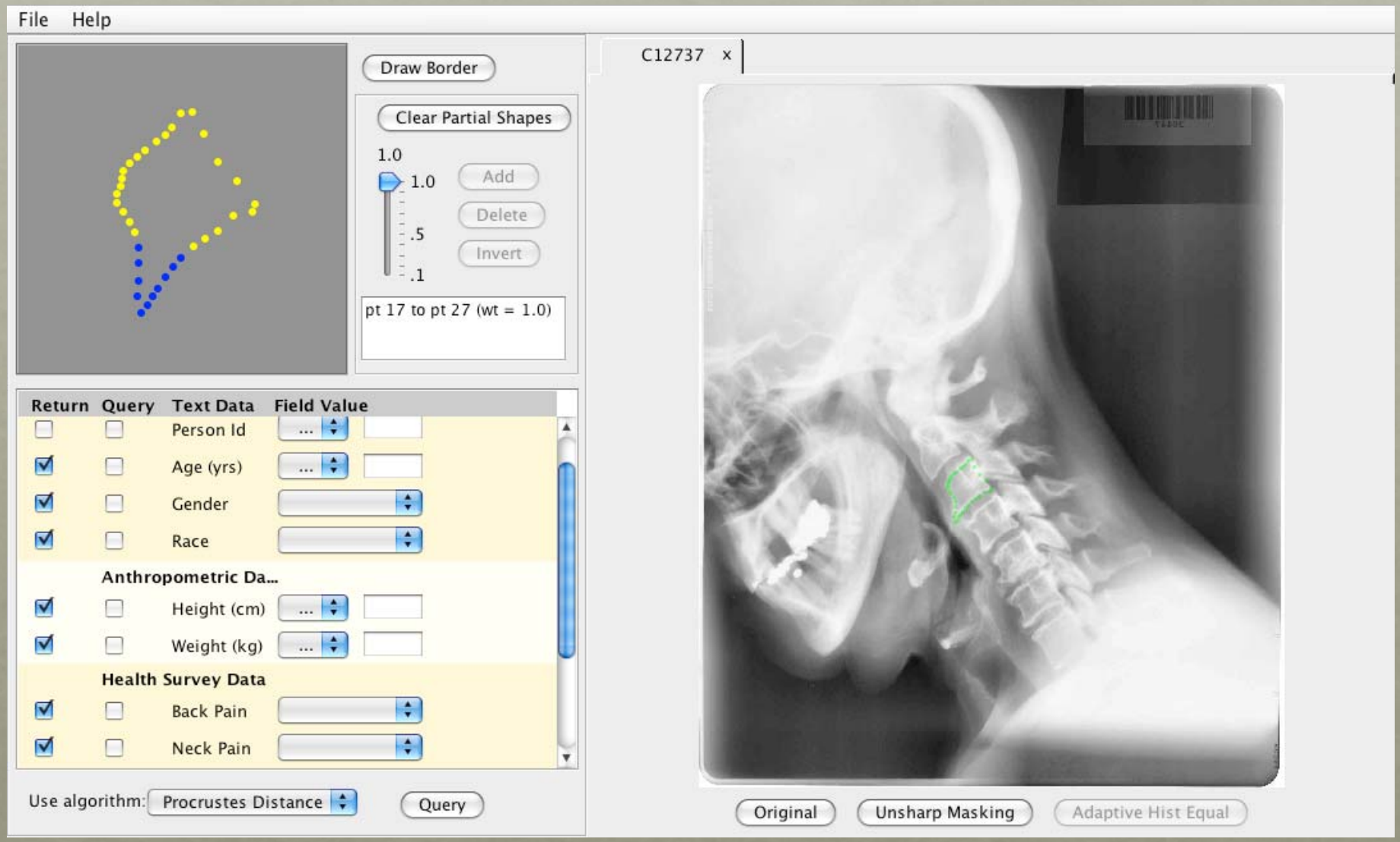
- Conceptual mockups
- Low, mid, & high-fidelity prototypes

CBIR USABILITY CHALLENGES *... or gaps.*

- **Query Gap**
  - Query capability, visual expressivity, multi-modality support, etc.
- **Feedback Gap**
  - Level of information provided in response to query.
- **Refinement Gap**
  - Support for improvement of results, capability to “learn”, etc.
- ***Design Gap***
  - Application of user-centric design principles in the system. Explores comprehensibility, “usability”, value, etc.

SPIRS

http://archive.nlm.nih.gov/spirs



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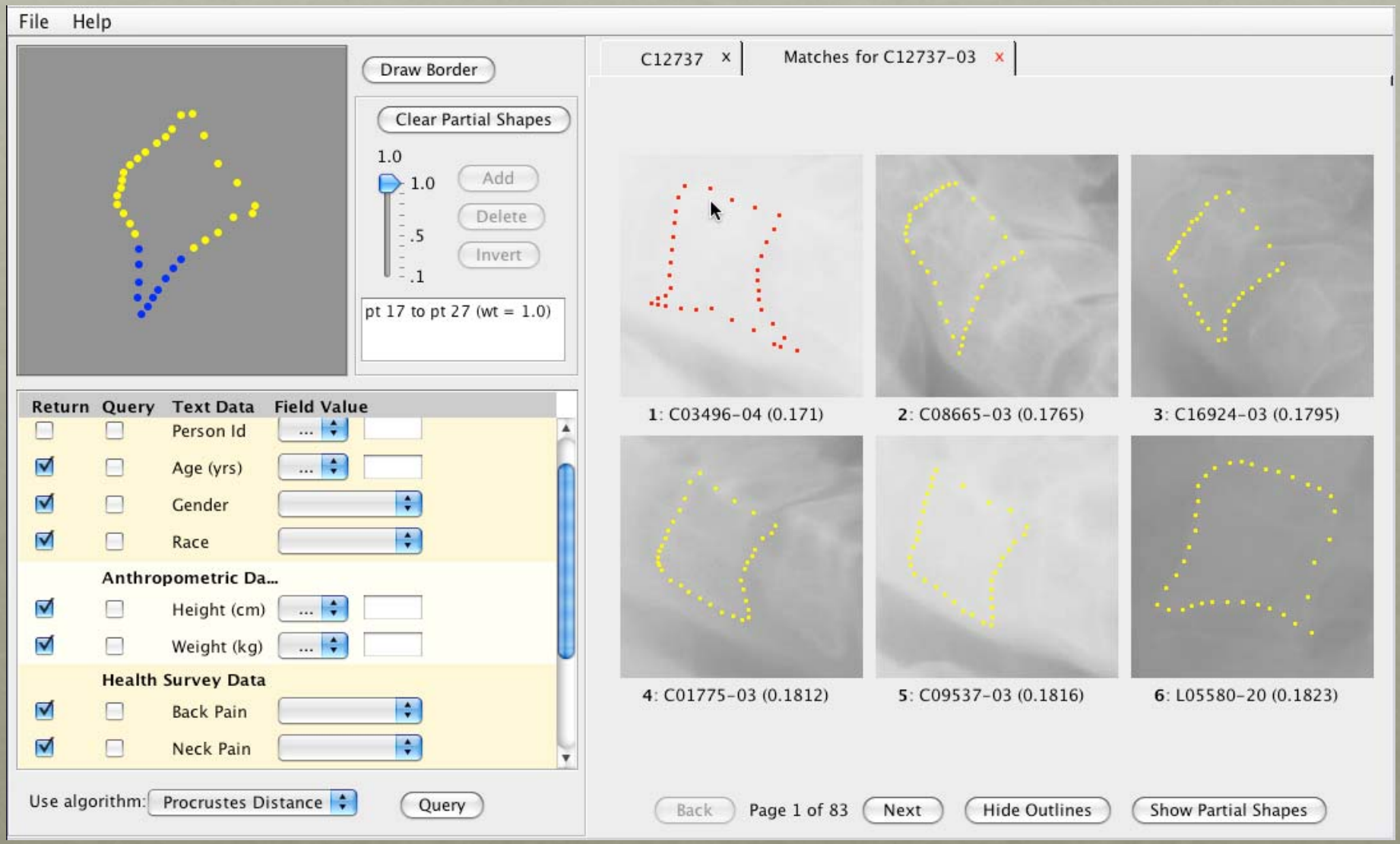

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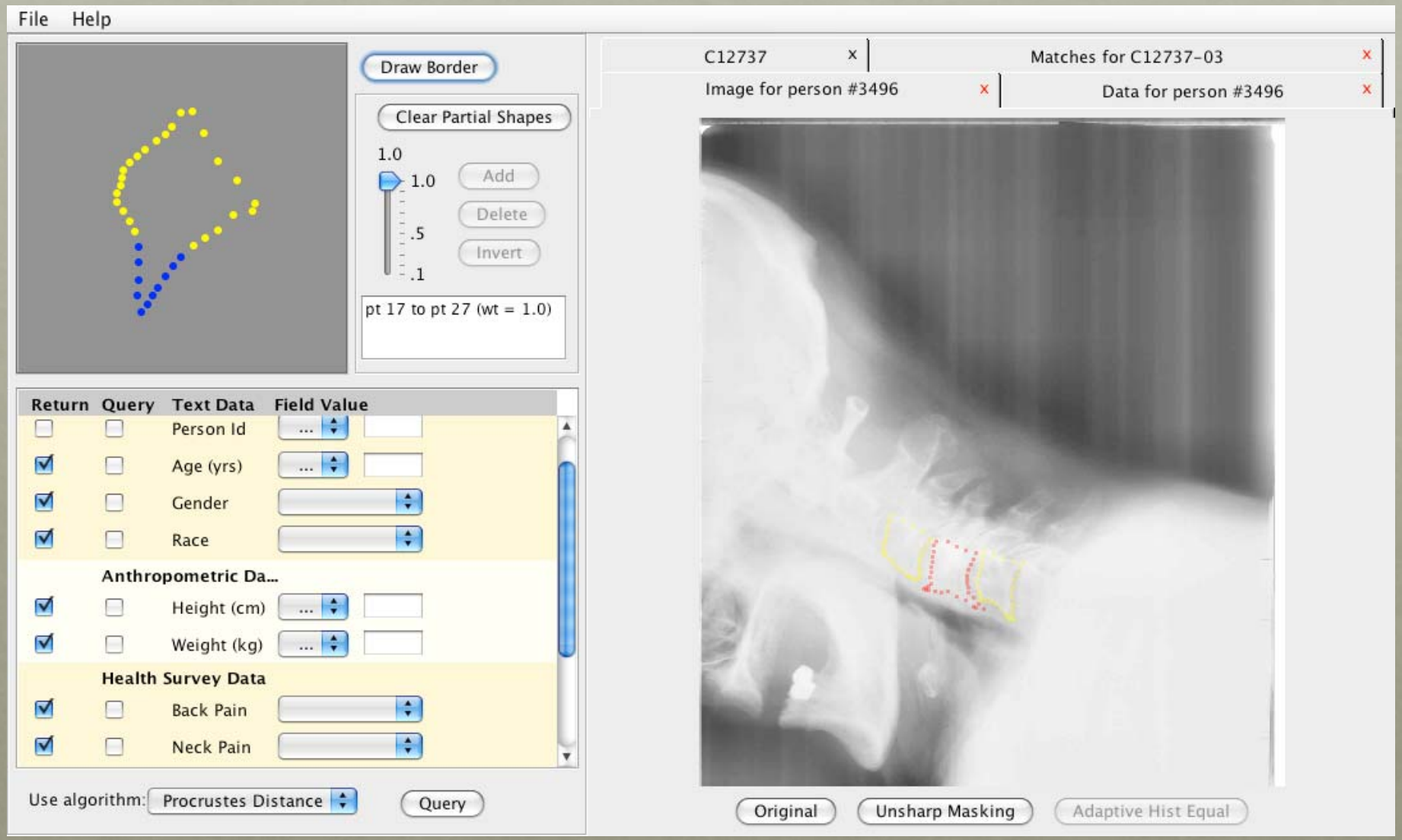

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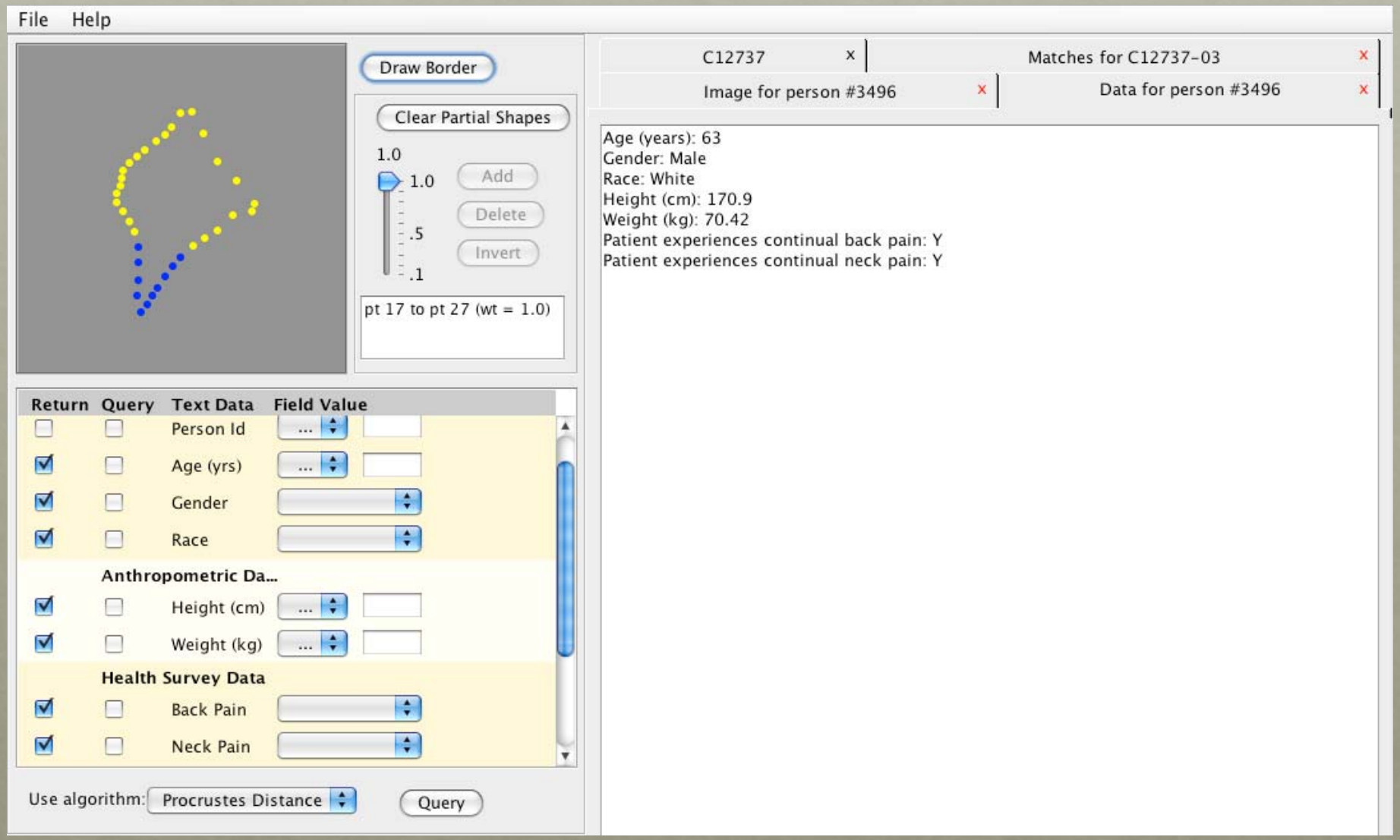
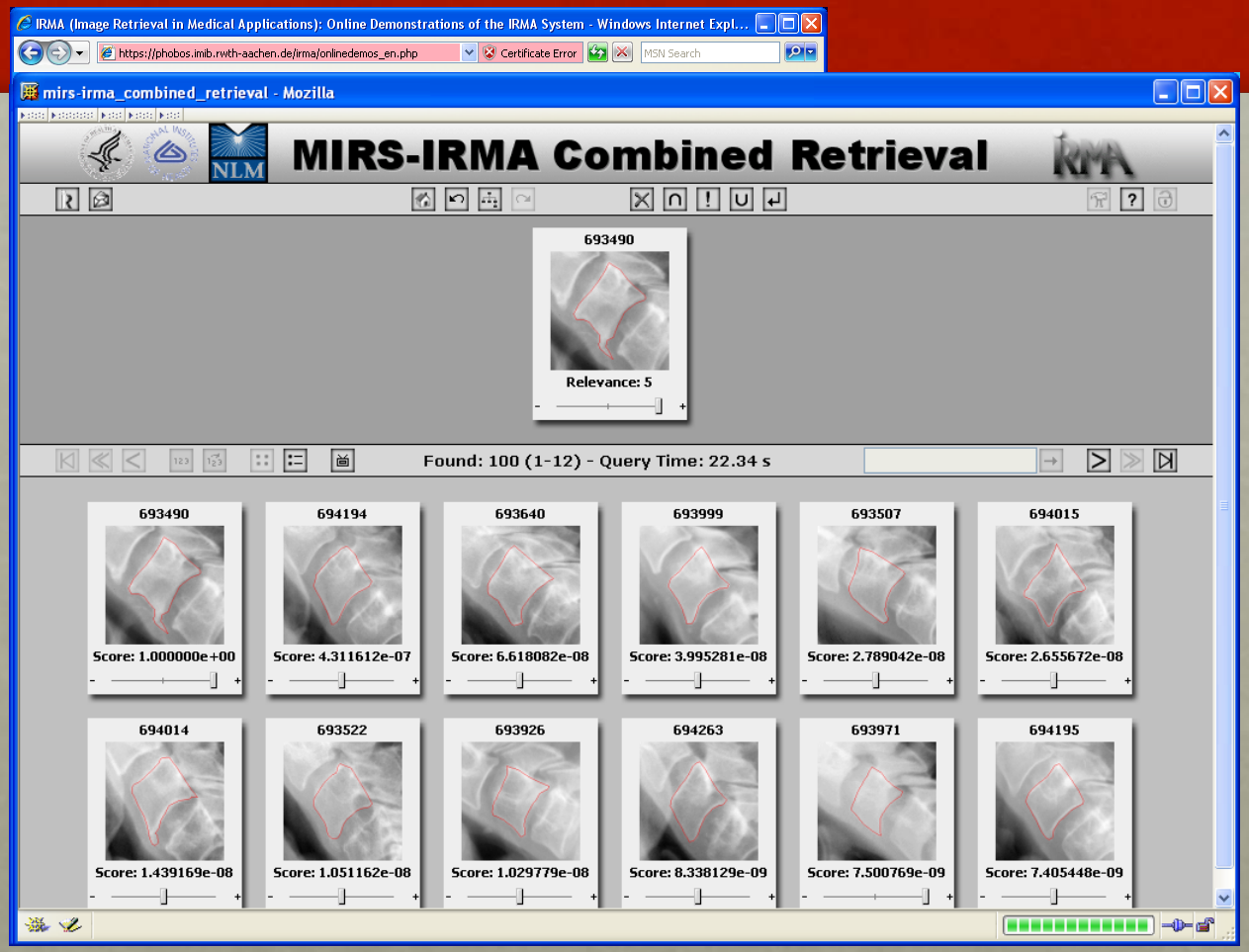


SPIRS-IRMA

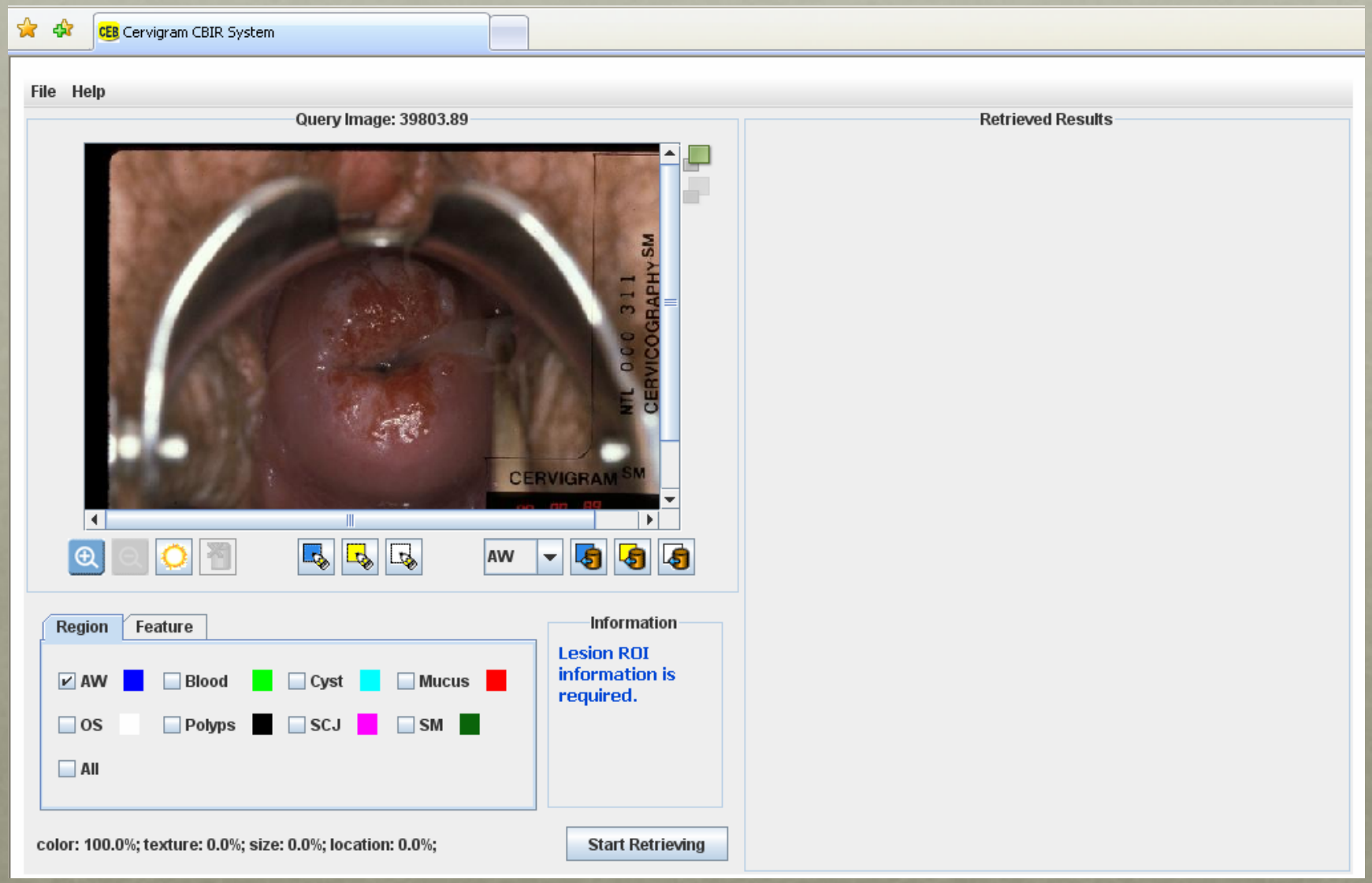
http://irma-project.org



Local CBIR

Global CBIR

CERVIGRAM FINDER



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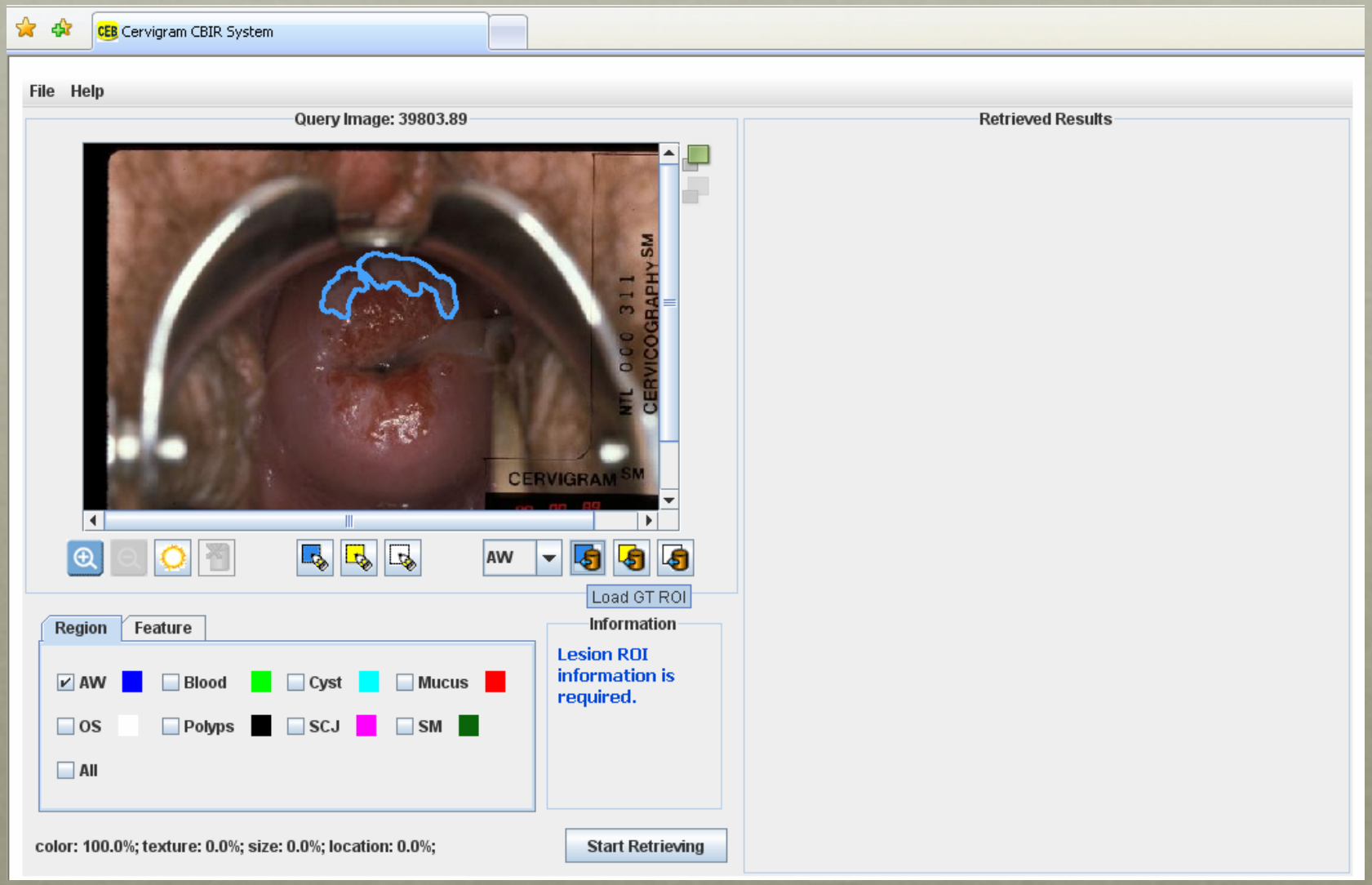

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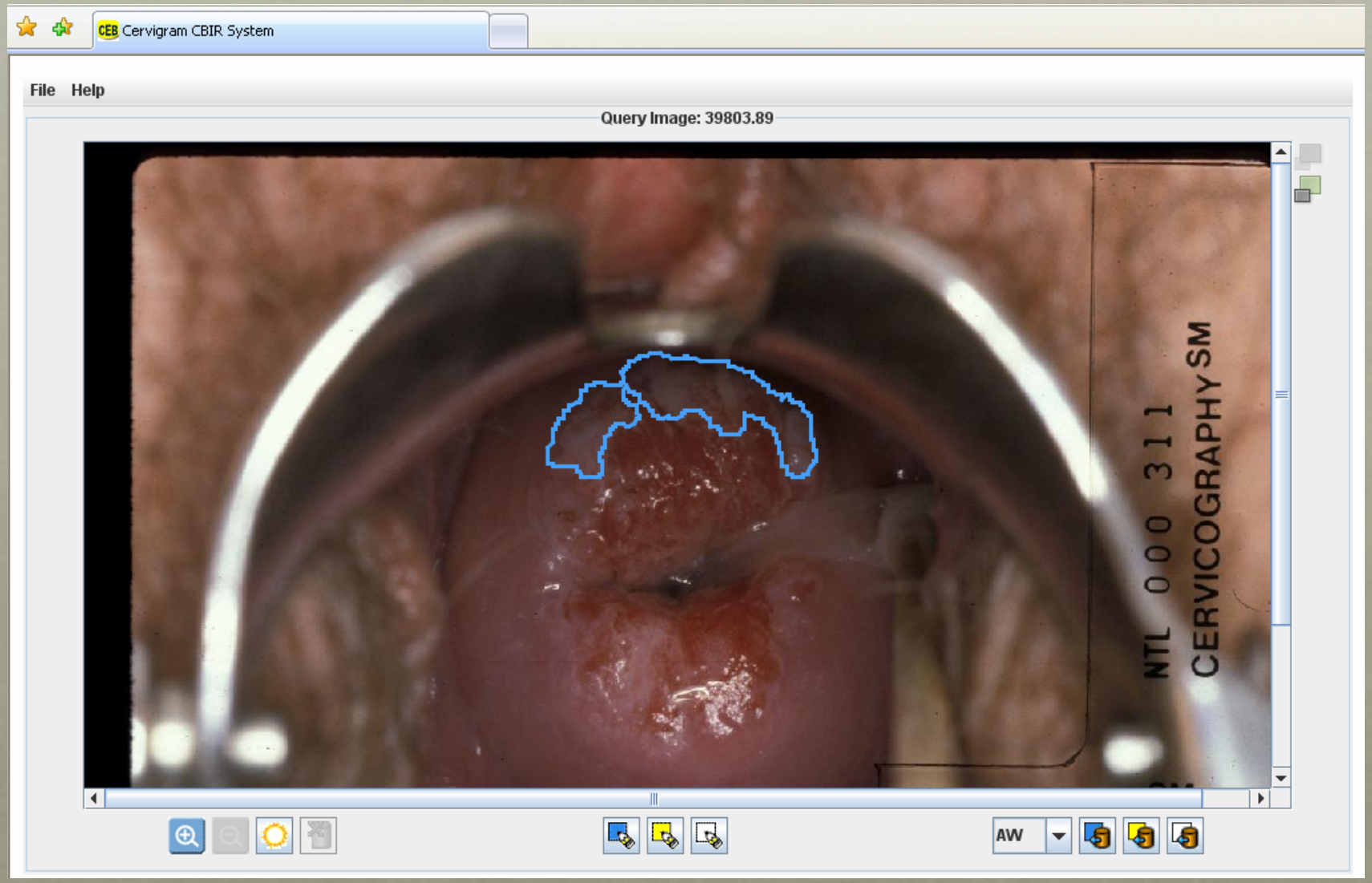

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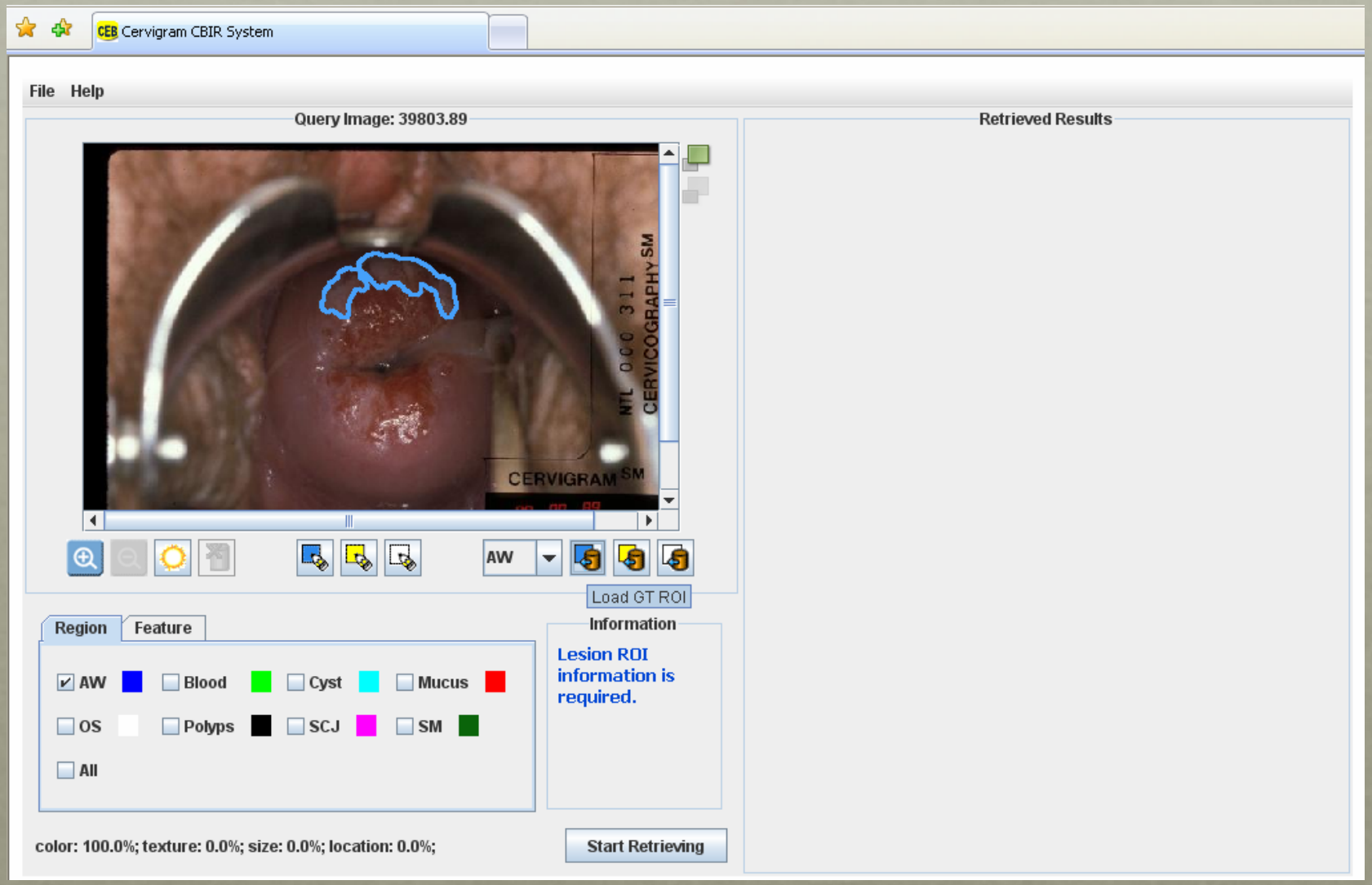

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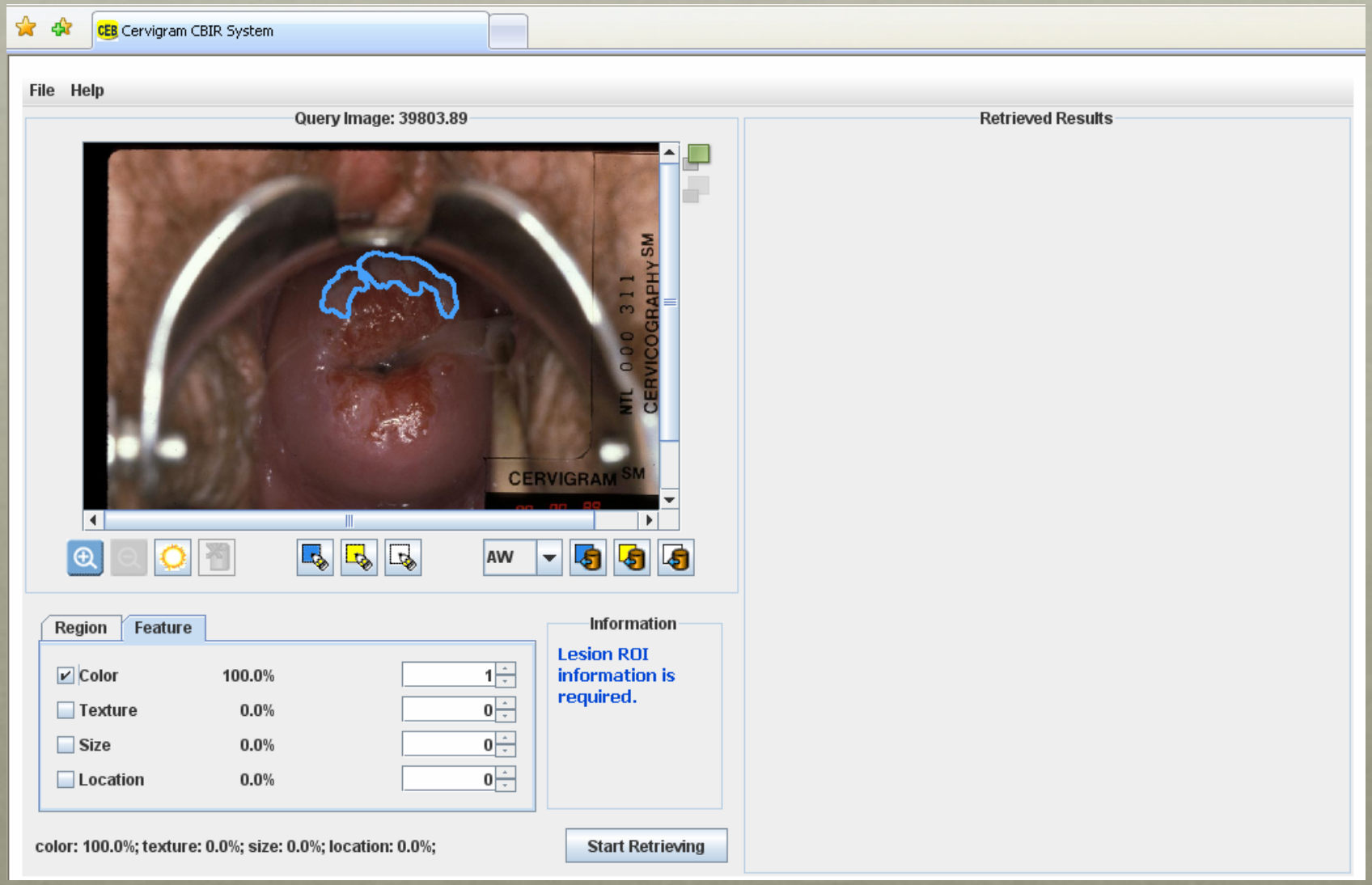

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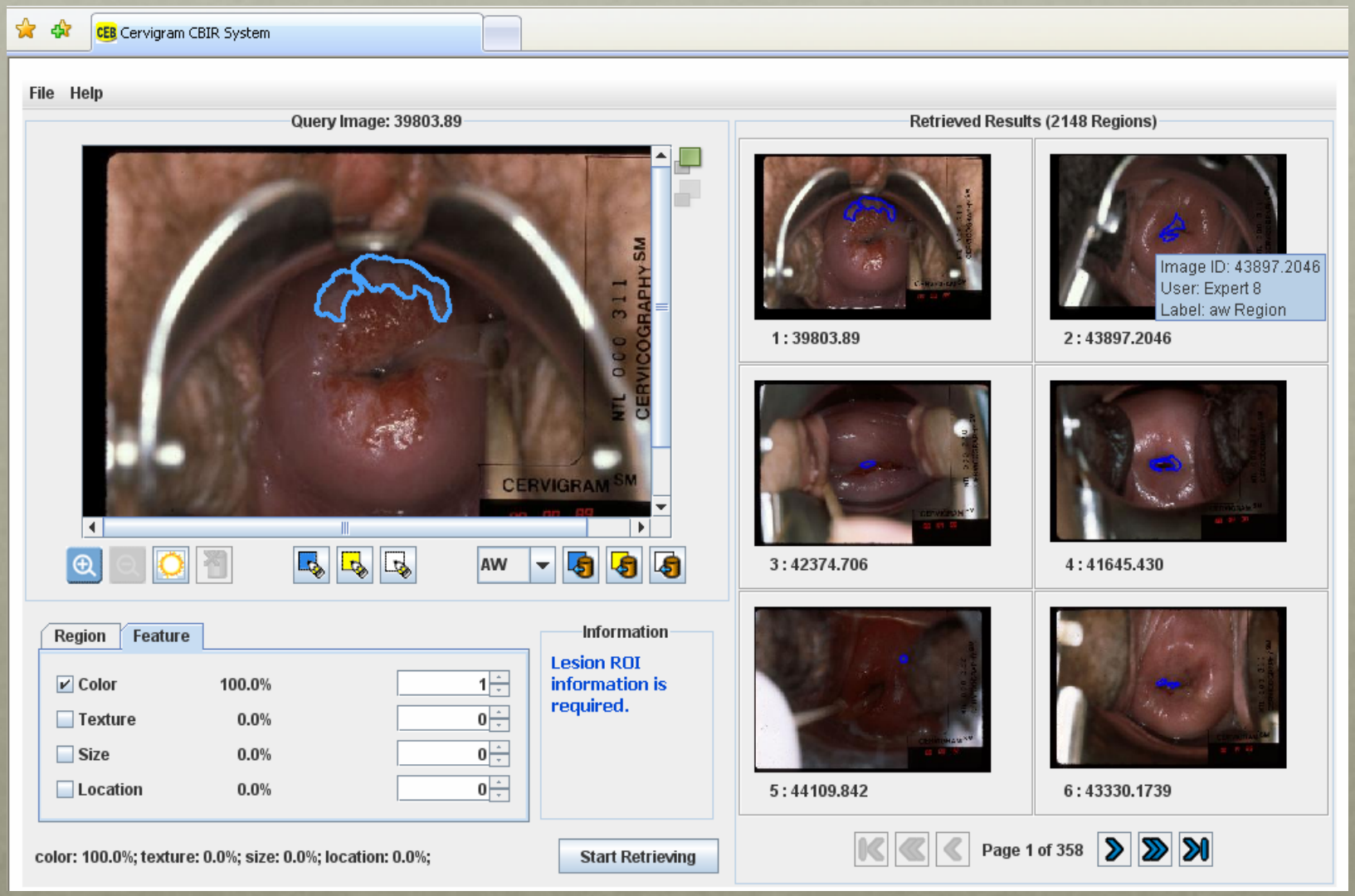

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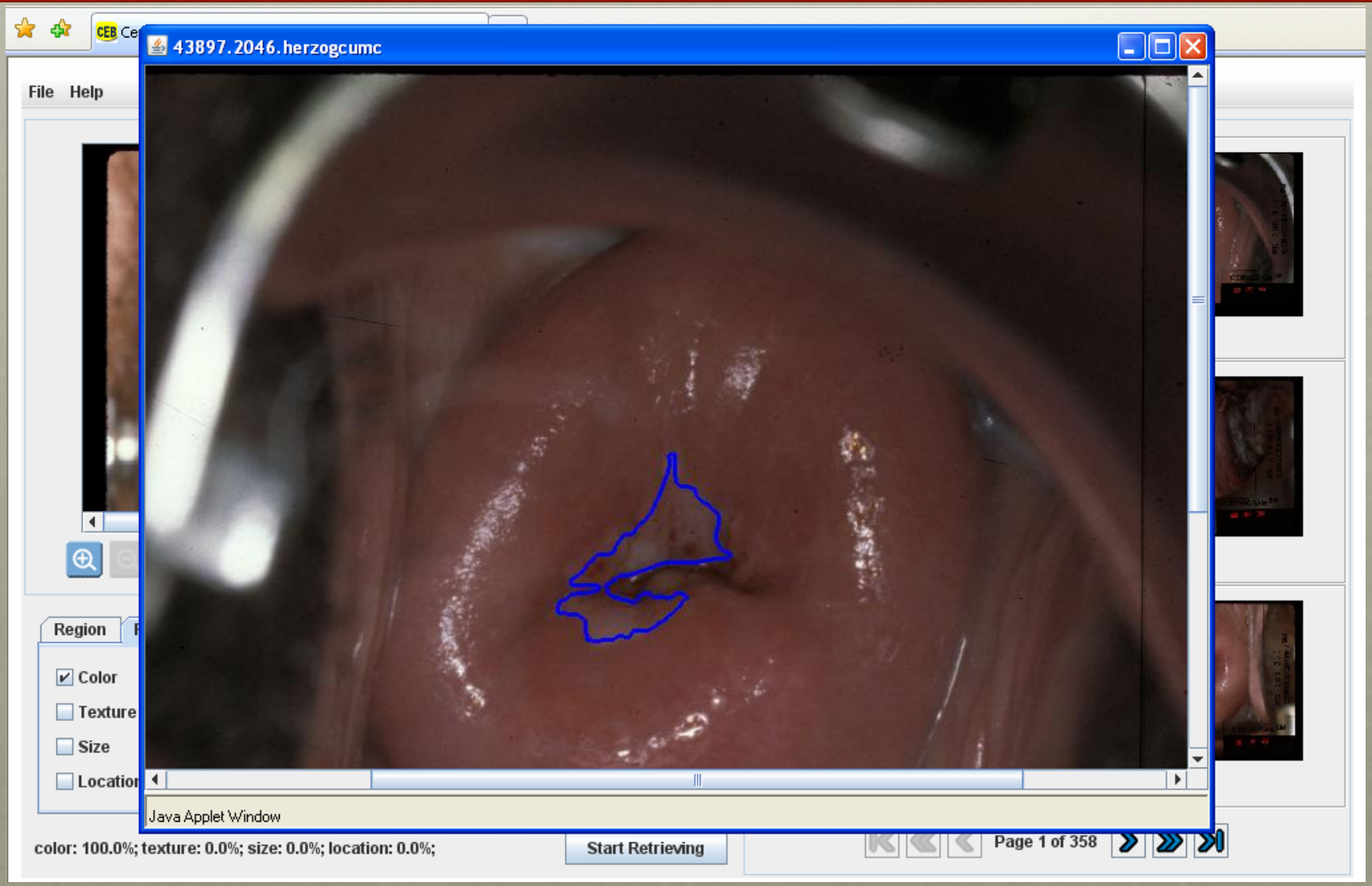

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DISCUSSION POINTS …

- What are conditions are **Necessary and Sufficient** before **Query Gap** and **Feedback Gap** can be considered closed?
- Do they vary by application and/or image characteristics?
- How much refinement is permissible?
- Do we (as researchers, engineers, application developers, users) give sufficient consideration to the **Design Gap**?
- Which of these, in your mind, has the greatest impeding factor?