

XML Introduction

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Fingerprint Workshop

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NIST

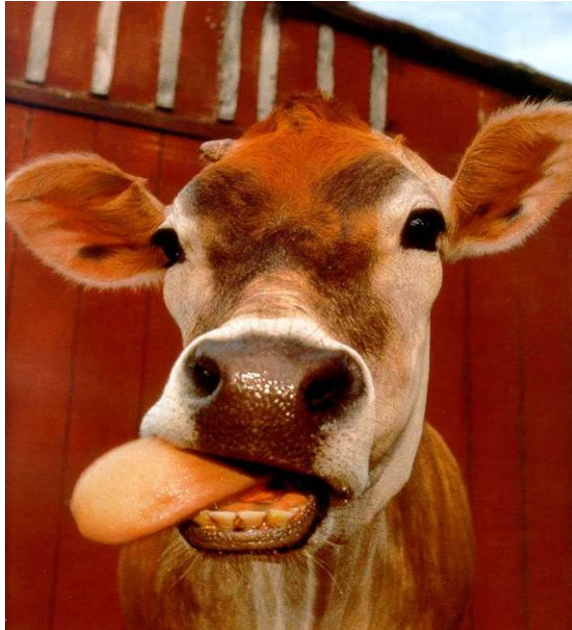
National Institute of
Standards and Technology

XML and Bovine Geometry

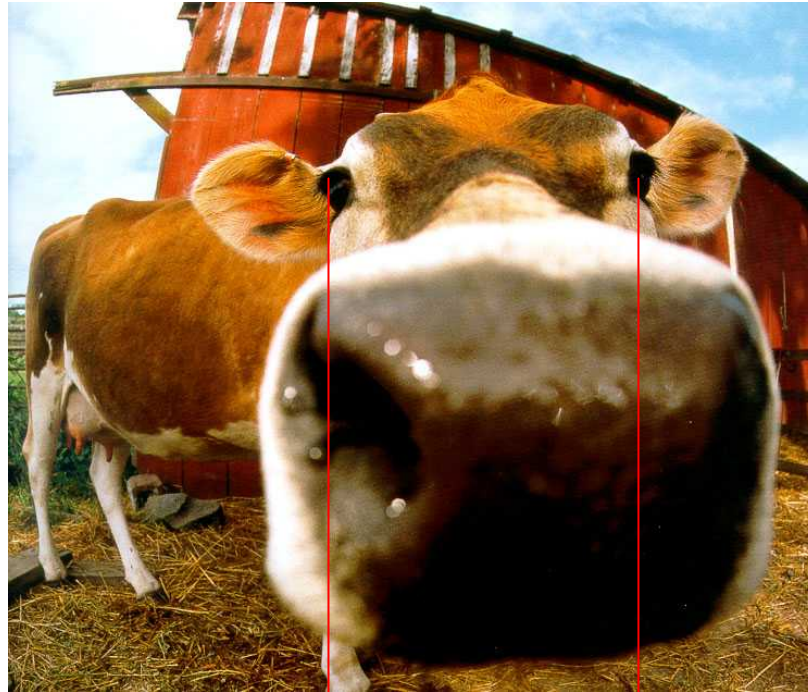
**Cattle-ized Biometric Identification
of Fertility Features (CBIFF)**



Image Quality

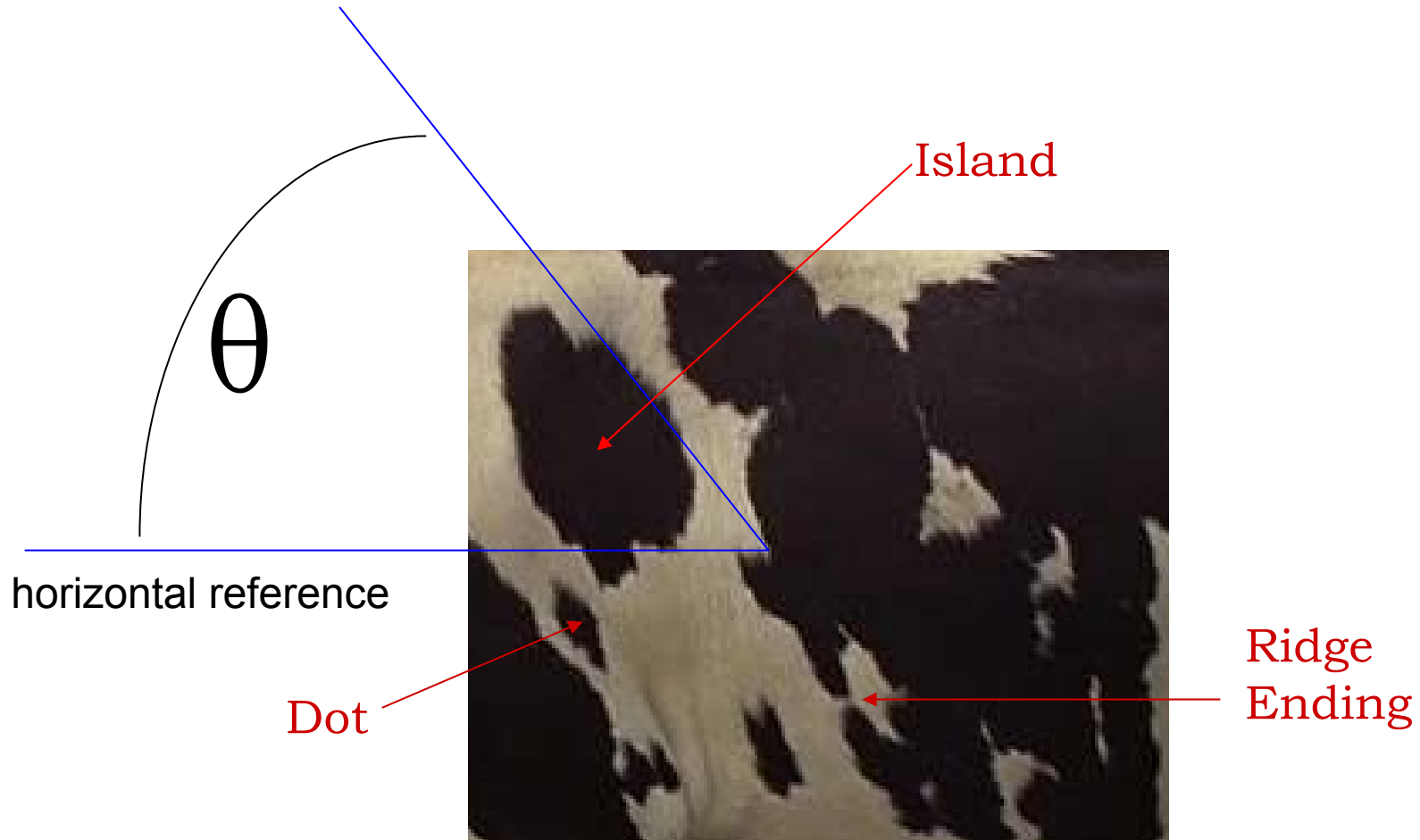


Facial Recognition



← 120 Pixels →

Minutiae Templates



What is XML?

- eXtensible Markup Language
- Generic format for tagging data
- World Wide Web Consortium (W3C) specification
- Tutorial: www.w3Schools.com/xml
- A *text* format
- Related:
 - Stylesheet Transformations
 - Schema

HTML

Transmission format:

Now is the `time` for all good men to come to.

Presentation format:

Now is the **time** for all good men to come to.

XML

Like HTML, the tags are symmetrical . . .

<open> DATA **</open>**

. . . but the tag names are user defined.

Tags can be nested...

<verbs>

<open> DATA **</open>**

<close> DATA **</close>**

</verbs>

...well-formed XML

Officially...

- The design goals for XML are:
 - XML shall be straightforwardly usable over the Internet.
 - XML shall support a wide variety of applications.
 - XML shall be compatible with SGML.
 - It shall be easy to write programs which process XML documents.
 - The number of optional features in XML is to be kept to the absolute minimum, ideally zero.
 - XML documents should be human-legible and reasonably clear.
 - The XML design should be prepared quickly.
 - The design of XML shall be formal and concise.
 - XML documents shall be easy to create.
 - Terseness in XML markup is of minimal importance.

For the ANSI/NIST fingerprint standard, XML would replace:

- Field tag names
 - 2.001 would become <Length>
- Separators
 - *FS, GS, RS, US* items would be delimited by tag names and angle brackets. < >

Why XML?

- XML is “built in”:
 - Databases
 - Web Servers
 - Browsers
 - Application development software
- Applications don’t have to handle:
 - Parsing
 - Validation
 - Translation to presentation format

Why XML?

- It is the currency of *web services* and *SOAP* communication.
- XML-appliances are available to optimize security and performance.
- A growing infrastructure of tools (DOM, SAX, XPath, XML Query).
- XML is open, interoperable across vendor platforms
- XML has archival “readability”

Why not XML (yet)?

- XML is a **text**-formatting convention, and not optimized today for handling binary objects.
- *WebServices* is the principal mechanism for carrying XML payloads.
 - *The SOAP envelope, security and guaranteed delivery have yet to mature*

Your programmers can do anything. . .

```
<Record><Name>John Smith</Name><Mugshot>  
<Length>380</Length><BinaryData>□▲»¿¾§  
ß€åū∞≡£⊠⋈ظ■☺♠♪♫åūū∞≡£⊠⋈ظ■☺♠♪∞≡£⊠⋈ظ□  
▲ <»¿¾§»¿¾§€åū</BinaryData></Mugshot>  
</Record>
```

. . . but you lose the power of the
tools to parse and validate data.

Proposals for Binary Data

- Embedding Base-64 coded data
- Referencing (URI)

- SOAP with Attachments (SwA)
- WebService Attachments (WS-attachments)
- Multipurpose Internet Mail Extensions (MIME)
- Direct Internet Message Encapsulation (DIME)
- XML-binary Optimized Packaging (XOP)
- Message Transmission Optimization Mechanism (MTOM)

Joint Task Force on Rapsheet Standardization

- FBI, SEARCH, State Criminal History Repositories, CJIS Advisory Policy Board, NLETS
- Created a rapsheet transmission standard using tagged data, like the ANSI/NIST fingerprint transmission standard
- Created an XML transmission standard conforming to the Global Justice XML Data model

JTF Findings

- Rapsheet presentation formats across 50 states were all different.
- XML and XSL can bring order to diversity.
- NCIC and IAFIS data sets and codes were not compatible.
- Code values are meaningless to the civilian users of criminal history records.

<PalmImageTypeCode>

45

</PalmImageTypeCode>

<PalmImageType>

Right Carpal Roll

</PalmImageType>

JTF Recommendations

- The FBI should develop a Type-2 Record specification using GJXDM-conformant XML.
- An XML version of the entire structure of the fingerprint transmission package should be developed.

Example

```
<FingerprintTransmissionPackage>
  <RecordType01TransactionRecord>
    <Length>305</Length>
    <Version>0900</Version>
    <Content>...</Content>
  </RecordType01TransactionRecord>
  <RecordType02DescriptiveText>
    <Length>813</Length>
    <ImageDesignationCharacter>00</ImageDesignationCharacter>
  </RecordType02DescriptiveText>
  <RecordType14VariableResolutionTenPrintRecord>
    <Length>813</Length>
    <ImageDesignationCharacter>01</ImageDesignationCharacter>
    <CompressionAlgorithm>WSQ20</CompressionAlgorithm>
    <ImageBase64>8vnsI3ULdnsU=</ImageBase64>
  </RecordType14VariableResolutionTenPrintRecord>
</FingerprintTransmissionPackage>
```

edi meets xml

- Information site:
 - <http://www.doj.state.wi.us/les>

