

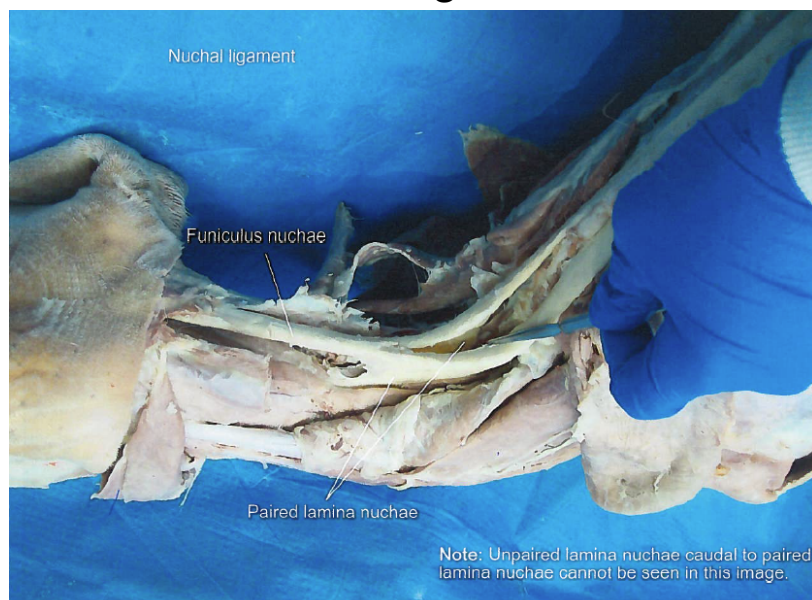
Islandora Image Annotation Framework

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Our main use case

Starting with the goat, create an online anatomical atlas that can be integrated into the curriculum.



Existing Image Annotation Frameworks

- Text-Image Linking Environment (TILE)
 - <http://mith.umd.edu/tile/>
- YUMA
 - <http://yuma-js.github.com/index.html>
- DM : Tools For Digital Annotation and Linking
 - <http://ada.drew.edu/dmproject/>
- imageMAT - part of the MARGOT project
 - <http://mat.uwaterloo.ca/MAT/>
- SharedCanvas
 - <http://www.shared-canvas.org>

Islandora Image Annotation Components

- Open Annotation Collaboration
- SharedCanvas
- Fedora
- Islandora
- Drupal
- Solr

Open Annotation Collaboration Data Model

An interoperable framework

- a web-centric method, promoting discovery and sharing of annotations
- associations between resources and annotations (body and target)
- content can be embedded within the annotation
- annotation of parts of a resource

<http://www.openannotation.org/spec/core/>

SharedCanvas

- [SharedCanvas](http://www.shared-canvas.org/) is a Distributed Canvas Rendered from Linked Data Annotations and extends the OA model
- The IIAF has simplified the data model to use only OA. But we still rely on javascript developed as part of the SharedCanvas project.

<http://www.shared-canvas.org/>

Metadata

- MODS is used to describe images
 - an Islandora XML Form customized for the project requirements.
- MADS is used to describe anatomical objects (muscles, vessels, bones, etc.)
 - We consider the anatomical objects 'authority' objects.
 - Islandora XML Forms for each type of anatomical part.

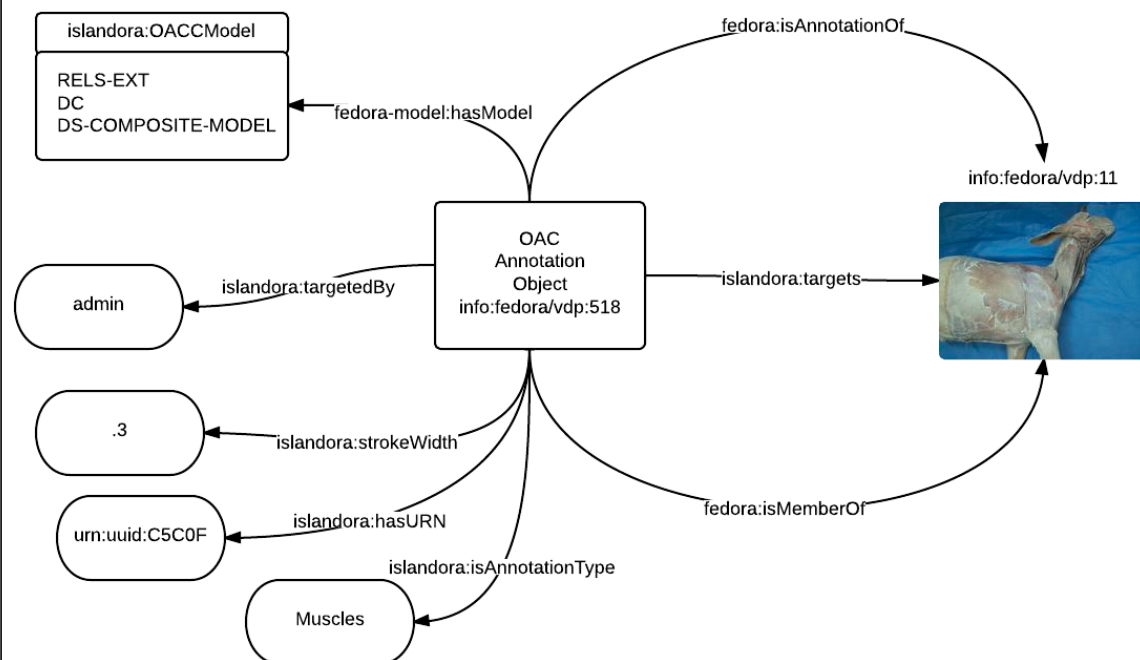
Anatomy Annotations

- Each Annotation is a separate Fedora Object
- RELS-EXT of each Annotation Object contains the relationship to an Image Object
- Annotation Objects can be related to more than one object (not implemented in the user interface yet)
- Annotation information is stored in an OAC datastream

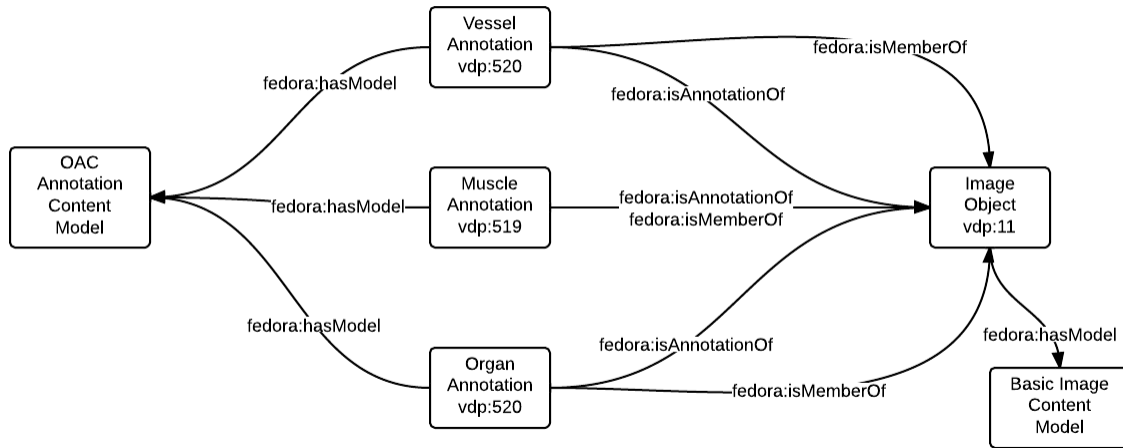
Annotation RELS-EXT Datastream

```
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:fedora="info:fedora/fedora-system:def/relations-external#"
  xmlns:fedora-model="info:fedora/fedora-system:def/model#"
  xmlns:islandora="http://islandora.ca/ontology/relsext#">
  <rdf:Description rdf:about="info:fedora/vdp:518">
    <fedora-model:hasModel rdf:resource="info:fedora/islandora:OACModel">
    </fedora-model:hasModel>
    <fedora:isMemberOf rdf:resource="info:fedora/vdp:11"></fedora:isMemberOf>
    <islandora:targetedBy>admin</islandora:targetedBy>
    <islandora:targets rdf:resource="info:fedora/vdp:11"></islandora:targets>
    <fedora:isAnnotationOf rdf:resource="info:fedora/vdp:11"></fedora:isAnnotationOf>
    <islandora:isAnnotationType>Muscles</islandora:isAnnotationType>
    <islandora:hasURN>urn:uuid:C5C0FAB8-A330-0001-CB9A-29EFB1C11253</islandora:hasURN>
    <islandora:strokeWidth>.3</islandora:strokeWidth>
  </rdf:Description>
</rdf:RDF>
```

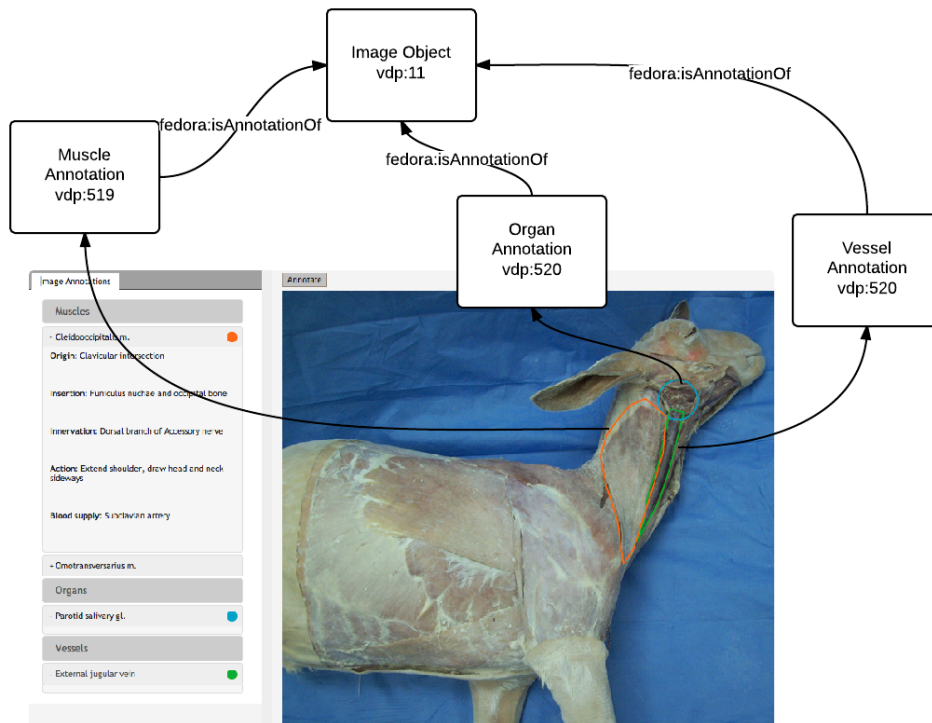
Fedora Data Model



Annotations' Fedora Relationships



Annotations' Fedora Relationships



OAC Datastream XML

```
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:dcterms="http://purl.org/dc/terms/"
xmlns:dctype="http://purl.org/dc/dcmitype/"
xmlns:oa="http://www.w3.org/ns/openannotation/core/"
xmlns:cnt="http://www.w3.org/2008/content#"
xmlns:dms="http://dms.stanford.edu/ns/"
xmlns:ore="http://www.openarchives.org/ore/terms/"
xmlns:exif="http://www.w3.org/2003/12/exif/ns#">
  <rdf:Description rdf:about="urn:uuid:C5C0FAB8-A330-0001-CB9A-29EFB1C11253">
    <rdf:type rdf:resource="http://www.w3.org/ns/openannotation/core/Annotation"></rdf:type>
    <oa:hasBody rdf:resource="urn:uuid:C5C0FAB8-A340-0001-6CDD-D80E17102D80"></oa:hasBody>
    <oa:hasTarget rdf:resource="urn:uuid:C5C0FAB8-A350-0001-FF7B-30BC1BD08E10"></oa:hasTarget>
    <dcterms:created>2013-07-04 12:03:44 UTC</dcterms:created>
    <dc:title>Omotransversarius m.</dc:title>
    <dc:type>Muscles</dc:type>
  </rdf:Description>
  <rdf:Description rdf:about="urn:uuid:C5C0FAB8-A340-0001-6CDD-D80E17102D80">
    <rdf:type rdf:resource="http://www.w3.org/2008/content#ContentAsText"></rdf:type>
    <cnt:chars><b>Origin</b>: Distal scapular spine (Acromion)<br><br><br><br>
    <b>Insertion</b>: Wing of the atlas<br><br><br><br>
    <b>Innervation</b>: Dorsal branch of Accessory nerve and local cervical spinal nerves<br><br><br><br>
    <b>Action</b>: Advance the limb, flex the neck laterally<br><br><br><br>
    <b>Blood supply</b>: Subclavian artery<br><br><br><br>
    <cnt:characterEncoding>utf-8</cnt:characterEncoding>
  </rdf:Description>
  <rdf:Description rdf:about="urn:uuid:C5C0FAB8-A350-0001-FF7B-30BC1BD08E10">
    <rdf:type rdf:resource="http://www.w3.org/ns/openannotation/core/ConstrainedTarget"></rdf:type>
    <oa:constrains rdf:resource="http://vdp.vre3.upei.ca/islandora/object/vdp:11/datastream/0B1/view/Canvas"></oa:constrains>
    <oa:constrainedBy rdf:resource="urn:uuid:C5C0FAB8-A350-0001-AF20-69114A202850"></oa:constrainedBy>
  </rdf:Description>
  <rdf:Description rdf:about="urn:uuid:C5C0FAB8-A350-0001-AF20-69114A202850">
    <rdf:type rdf:resource="http://www.w3.org/ns/openannotation/core/SvgConstraint"></rdf:type>
    <rdf:type rdf:resource="http://www.w3.org/2008/content#ContentAsText"></rdf:type>
    <cnt:chars>&lt;svg:path xmlns:svg="http://www.w3.org/2000/svg"&apos; fill="none"&apos;
    stroke="black"&apos; d="M1749,1459L1611,1284L1555,1187L1407,1083L1258,1031L885,897L1191,882L1280,900L1366,
    900L1444,915L1514,930L1570,926L1634,874L1689,1034L1742,1135L1779,1239L1782,1380Z"&apos;
    style="stroke-width: 0.3%;&apos; opacity="none"&apos; stroke-width="0.3%;&apos; &gt;&lt;/svg:path&gt;</cnt:chars>
    <cnt:characterEncoding>utf-8</cnt:characterEncoding>
  </rdf:Description>
</rdf:RDF>
```

OAC Annotation Datastream

vdp:518/OAC

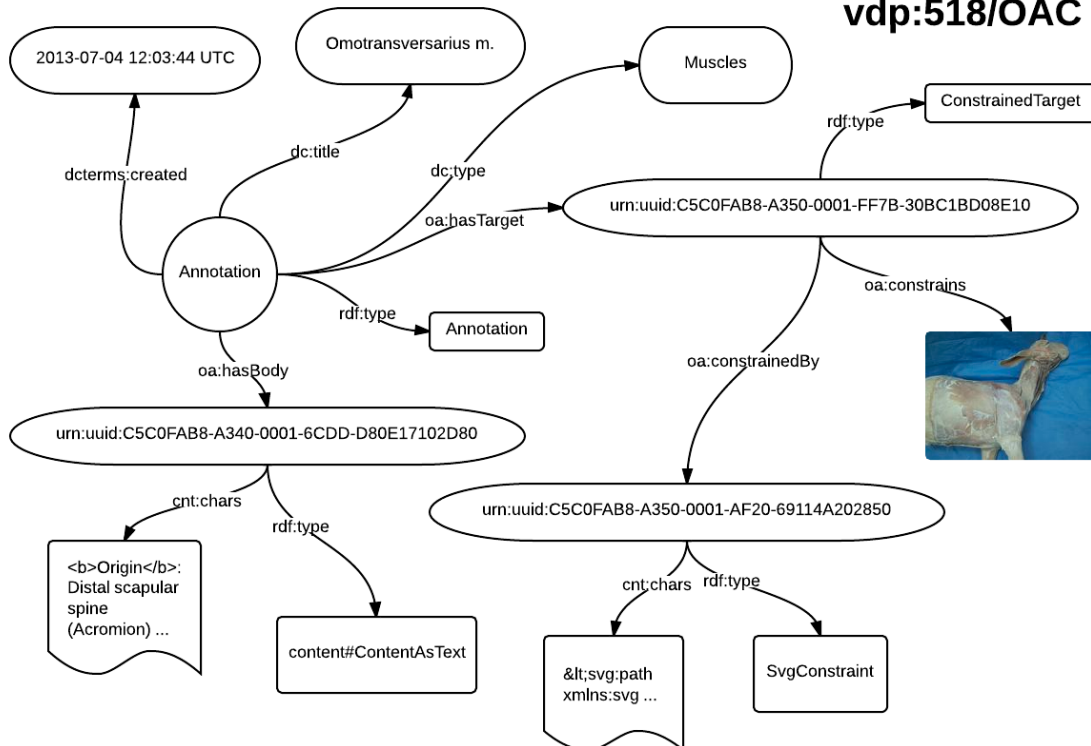


Image Annotation Module

- Using forked version of SharedCanvas' javascript to render annotations
- Can be configured to work with other Islandora content models/solution packs (eg. large_image, book or newspaper.) ... how? DS-COMPOSITE-MODEL mimetypes?
- Other modules do not need to be aware of the Image Annotation module
- Should also work with future image type solution packs

Drupal Taxonomies

- The module can be configured to use Drupal taxonomies to limit annotation types to certain terms
- These types are stored with the OAC annotation as dc:type element
- If configured these types can also be used in Solr queries to implement a dropdown or type ahead for annotation titles (via a solr query)

Annotation Admin Options - Content Models and Anno. Categories

Home » Administration » Islandora

CONFIGURE CONTENT MODELS

Select Content Models

ENABLE ANNOTATING	CONTENT MODEL	PID	DSID	TAXONOMY
☒	Islandora basic image content model	islandora:sp_basic_image	OBJ	Goat Anatomy
☐	Islandora Internet Archive Book Content Model	islandora:bookCModel	TN	none
☐	Islandora Newspaper Content Model	islandora:newspaperCModel	TN	none
☐	Islandora Newspaper Issue Content Model	islandora:newspaperIssueCModel	TN	none
☐	Islandora Newspaper Page Content Model	islandora:newspaperPageCModel	TN	none
☐	Islandora PDF Content Model	islandora:sp_pdf	TN	none
☐	Islandora Page Content Model	islandora:pageCModel	OBJ	none

Allow annotation of objects associated with these content models.

Admin can specify a Drupal Taxonomy.

ANNOTATION CATEGORIES

Annotation Categories

☐ User defined

☒ Administrator defined

Allows administrators to select predefined taxonomies to determine annotation categorization terminology

Annotation Type Search Field

anno_category_s

If Annotation Categories is set to User Defined and you want to do auto complete enter a solr field, this field's contents will be used to populate the auto complete.

Annotation Admin Options - Colors, Stroke Widths, Titles

ANNOTATION COLORS

Annotation Colors

☐ User defined (user selects when creating annotation)

If selected, a color picker displays in the annotation interface.

☒ Optimized (Colors are selected randomly. Recommended for overlapping annotations)

Annotation Stroke Widths for dropdown *

.3 .5 .7 .9 1 1.2 1.4

Can manually configure a series of stroke widths for different use cases.

The width of the lines to use when drawing the annotations. Must be a number, can include a decimal. For instance .5 is valid. You can Enter several values here seperated by a space.

CONTROLLED VOCABULARY FOR TITLES

☒ Use a Controlled Vocabulary for Annotation Titles

If checked you must configure a Solr Field to retrieve the titles from.

This allows for standard annotation entry.

Annotation Title Search Field

made_titles_sv

This must be a single valued solr field.

Searching and Indexing

- Each annotation object OAC datastream is indexed in Solr
- This allows searching annotation data and also allows data stored in Solr to be used in dropdowns and type ahead form fields.
- Custom search results to link to parent objects instead of annotations
- We also index the MADS and MODS datastreams

Search

Keyword search annotations only
- primary access point for students.

**VETERINARY ANATOMICAL ATLAS**

Home The Team About Browse Recently viewed annotations

Advanced Search

Field
Title

Search terms

Muscle, Nerve, Vessel, etc. Objects

- View images
 - Add a new image
- View muscles
 - Add a new muscle
- View nerves
 - Add a new nerve
- View vessels
 - Add a new vessel
- View other anatomical parts
 - Add an anatomical part

Welcome

This website allows users to browse and search for veterinary anatomical images. These images have been annotated and are a teaching resource of the Atlantic Veterinary College.

Advanced Search used by site admins to search across entire repository.

Search Results

List of annotations matching our query 'origin'. The Islandora Solr module allows us to add/remove display fields.

Islandora query

Query

- (-) origin

Advanced Search

Field

Title

Search terms

Search

Islandora facets

Annotation Title

- Cleidooccipitalis m. (1)
- Omotransversarius m. (1)

origin (x)

Search results

(1 - 2 of 2)



Title

Omotransversarius m.

Annotation Body

Origin: Distal scapular spine (Acromion)Insertion: Wing of the atlasInnervation: Dorsal branch of Accessory nerve and local cervical spinal nervesAction: Advance the limb, flex the neck laterallyBlood supply: Subclavian artery

Annotation Category

Muscles



Title

Cleidooccipitalis m.

Annotation Body

Origin: Clavicular intersectionInsertion: Funiculus nuchae and occipital boneInnervation: Dorsal branch of Accessory nerveAction: Extend shoulder, draw head and neck sidewaysBlood supply: Subclavian artery

Annotation Category

Muscles

Search results are customized so annotation type objects link back to the parent image

Annotation Editing Interface

Existing annotations displayed based on type/category.

Image Annotations

Muscles

Organs

Vessels

Annotate

Shape tools

Type:

Muscles

Title:

Cleidooccipitalis m.

Stroke Width:

.5

Annotation:

Origin: Clavicular intersection

Insertion: Funiculus nuchae and occipital bone

Innervation: Dorsal branch of Accessory nerve

Action: Extend shoulder, draw head and neck sideways

Blood supply: Subclavian artery

Shape tools

Type of Anno.

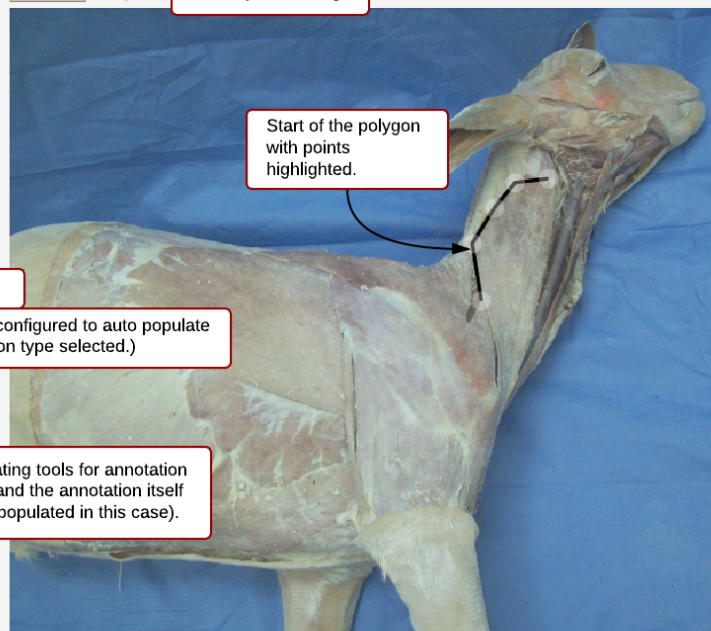
Titles (configured to auto populate based on type selected.)

Stroke Width

Formating tools for annotation body and the annotation itself (auto populated in this case).

Actively annotating.

Start of the polygon with points highlighted.



Other Use Cases: Digital Humanities

Exit Full Window
Return to Book View

Seq# 1
Critical Edition of Right Hand Left Hand, ed. Dean Jay Irvine - Seq# 1
Settings
Help

Entitles
Structure
Relations
Image Annotations

Textual Notes

+ Dividing line

+ Dividing line

- Demo Annotation

Textual Notes
to be removed

Explanatory Notes

RIGHT
HAND
LEFT
HAND

A TRUE LIFE OF
THE THIRTIES:
PARIS, TORONTO,
MONTREAL, THE WEST
AND VANCOUVER.
LOVE, POLITICS,
THE DEPRESSION
AND FEMINISM.

DOROTHY
LIVESAY

Path: tei

Annotate

Brought to you by EMIC

Other Use Cases: Newspapers

[illegible]

Other Use Cases: Manuscript Maps

Image Annotations

Person

- Neil McArthur

Person
Three 50 acre plots owned by Neil McArthur (Carpenter). Fronting on the road.

Annotate

Other Use Cases: Compound Objects

Image Annotations

Person

- W. R. Verge

Person
W. R. Verge - Class of 1904 - SDU

- M. M. MacDonald

Person
M. M. MacDonald

- T. Curren

Person
Rev. T. Curren

- T. Campbell

Person
Rev. T. Campbell

Building

- Main Buiding

Building
Main Building, SDU 1904

Annotate

Next Steps

- Integrate with Islandora OpenSeadragon Zoomable Viewer
- Enhance OAC annotations
 - Add dc:creator to annotation
 - Add dc:format to oa:hasBody (originally we only supported text but now we have HTML as well)
- Explore and integrate ontologies
- Code:
https://github.com/roblib/islandora_image_annotation