# Facility Informatics with GeoVisipedia

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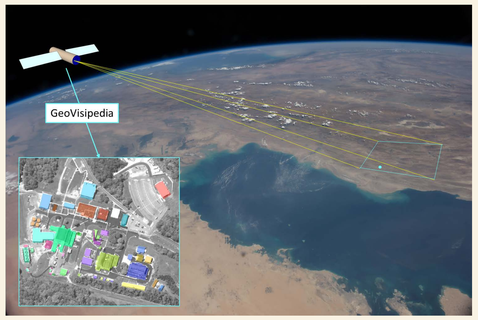
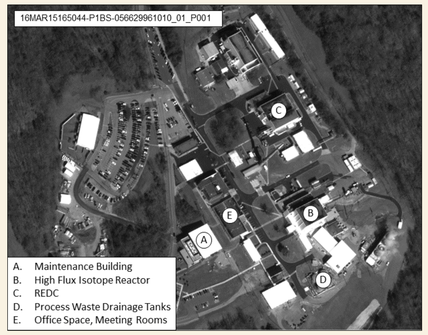
## GeoVisipedia is a new concept for annotation imagery




- GeoVisipedia automatically adds content to satellite imagery, regardless of viewing angle.
- SMEs add their insight. Knowledge integrates as we go along.
- Annotate once, annotated forever.




Conventionally annotated image is static —its knowledge content does not change.

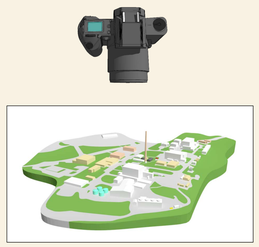
Imagery annotated with GeoVisipedia is dynamic, constantly updating—imagery becomes a portal to knowledge and insight.


An annotation in GeoVisipedia is a wiki page,

Wiki pages are containers for graphical content, which links back to source documents.

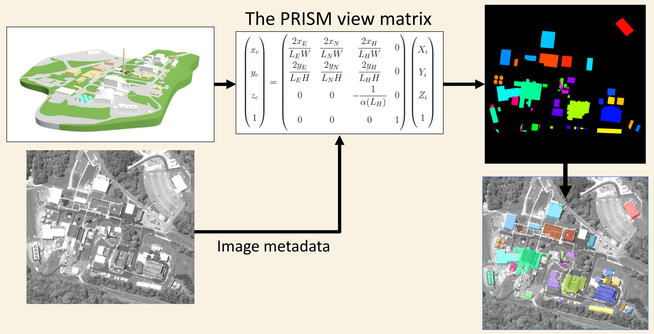
GeoVisipedia's approach is similar to browsing Google Image Search — a user rapidly scans imagery to find relevant content.

## GeoVisipedia uses the PRISM Algorithm to project annotations

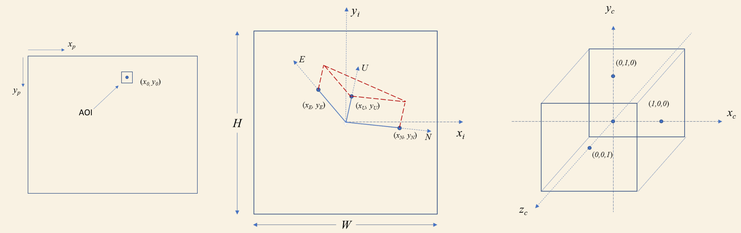


3D model of HFIR/RDEC facility courtesy of MINOS venture and Will Ray, ORNL

GeoVisipedia uses a 3D facility model to project annotations

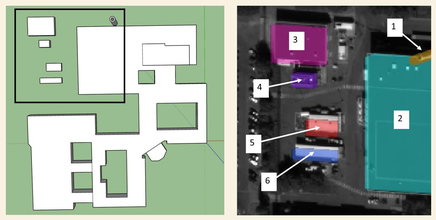



The PRISM algorithm uses satellite metadata and a 3D model to create mask that is projected onto the satellite image




A region of interest is selected in the satellite image, and a right prism is constructed in the center of the ROI. Using coordinates of the prism, the parameters of an affine camera model are found and scaled into normalized device coordinates to accommodate graphics engines

## Modeling and Image metadata inaccuracies






- **Individual objects shifting around throughout an ensemble of imagery can be caused by positioning inaccuracies in model:**
  - –Height of object.
  - –Position of object in model.
- **Given ensemble of images, adjust model to minimize projection errors over the ensemble.**
- **Constant shift of all projections in an image can be caused by:**
  - –Inaccurate global height of model.
  - –If the model has been vetted, in accuracies in image metadata (RPCs).
- **Global projection errors can be corrected by:**
  - –Nudging model. See next section of presentation.
  - –Nudge is currently manual, but readily automated.

## Preliminary Results

The PRISM algorithm accurately projects model components onto tall objects

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