

# Digital Arts and Humanities Workshop Series – Spring 2018

Fridays @ noon -- Scholars Commons IQ-Wall

Date	Topic	Presenter
Jan. 12	Intro to Digital Humanities	Tassie Gniady
Jan. 19	Intro to Visualization	Michael Boyles
Jan. 26	Intro to R	Tassie Gniady
Feb. 2	Augmented Reality	Chauncey Frend
Feb. 9	Text Analysis of Kurt Vonnegut w/ the HathiTrust & Voyant	Tassie Gniady & Robert McDonald
Feb. 16	Virtual Reality	Bill Sherman
Feb. 23	R for Twitter	Tassie Gniady
Mar. 2	Advanced Media	Chris Eller
Mar. 23	3D Object Acquisition & Printing	Jeff Rogers
Mar. 30	Network Graphs	David Kloster
Apr. 6	3D Photogrammetry	Tassie Gniady
Apr. 13	IQ-Tables & Touch-Enabled Software Workflows	David Reagan
Apr. 27	Omeka S and 3D Collections	Tassie Gniady & Will Cowan

# **IQ-Tables and Touch-enabled Workflows**

David M. Reagan  
Sr. Analyst/Programmer, Advanced Visualization Lab  
Indiana University

April 13, 2018



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# About Today's Workshop

- Touch hardware
- Touch software
  - Why (and why not) touch?
  - Examples
  - How to develop applications?
  - How to deploy applications?
- How to get help from the AVL
- Extra time: simple example walkthrough



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# Touch hardware

Large displays

- IQ-Table
- IQ-Wall
- Touch monitors
- Tablets



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# IQ-Table

- 65" monitor in table orientation
- Ultra-HD resolution
  - 3840 pixels by 2160 pixels
- Capable of 80-point multi-touch
- Built-in Windows PC
- Rolling, tilting stand



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# Why use touch?

- Engaging, natural user interface
  - Smart phones → user familiarity
- Simple logistics
  - No keyboard, mouse, etc
- Possibly multi-user, either independent or collaborating



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# Challenges with touch

- Take special care to teach the user when necessary
  - No hover events → no tooltips
- Fine interaction can be difficult
- Text input can be tricky
  - Onscreen keyboard?



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# AVL touch software history

- Custom software: 1997-2012
  - Places & Spaces: Illuminated Diagrams
  - Brownsburg Challenger Center
  - Supercomputing Conference booth kiosks
  - CIB digital signage
  - Digital Golden Book
- Web: 2016-present
  - *On the Road* Manuscript
  - Angel Mounds Historical Site
  - Places & Spaces: Macroscopes XI-XIII
  - HathiTrust Research Center Macroscope
  - Paleontology Collection + AR
  - 3D Prints Exhibit
- Open Exhibits & the AVL Collection Viewer: 2012-16
  - Cyberinfrastructure Building: Family Night
  - Folklife Festival Collection
  - AVL Collection
  - Audubon Collection
  - Applebee's Collection
  - Science Gateways Collection
  - Arts & Humanities Kiosk
  - Cyberinfrastructure Building: Kiosk
  - Places & Spaces: Maps Collection
  - ATL Collection
  - Indiana History Maps Collection
  - Mathers Museum Collection
  - Pervasive Technology Institute Collection
  - Science On a Sphere Kiosk
  - Science On a Sphere: World Cup Balls
  - Science On a Sphere Collection
  - Living Canvas: Drawings
  - Living Canvas: Chloroplasts
  - Imagining Science Collection
  - Media Digitization and Preservation Institute Collection
  - Biology Collection
  - Institute for Digital Arts & Humanities Collection



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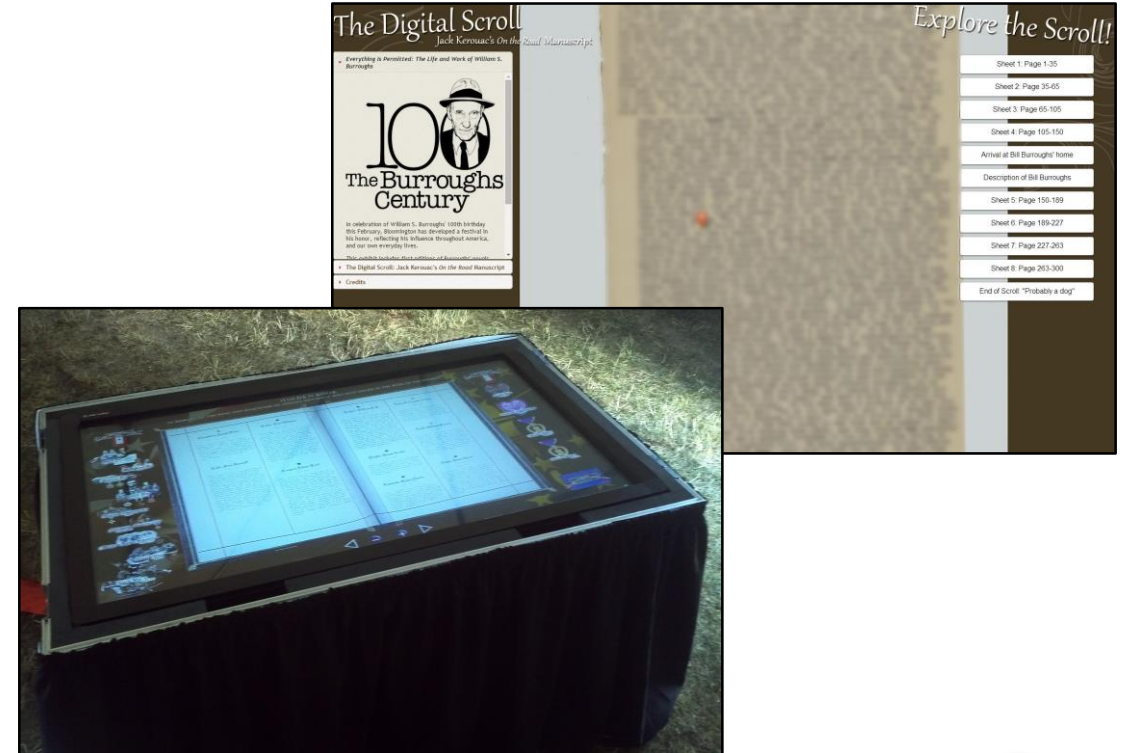
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# Use Case: Digital Interfaces to Scanned Books

- Digital Scroll
  - Collaboration with the Lilly Library
  - A multi-touch interface to Jack Kerouac's *On the Road* manuscript
- Digital Golden Book
  - Developed with the IU Office of Veteran Affairs and the Digital Library Program
  - Allows users to interact with the Golden Book, which cannot be done with the physical book
  - Permanently housed in the Indiana Memorial Union



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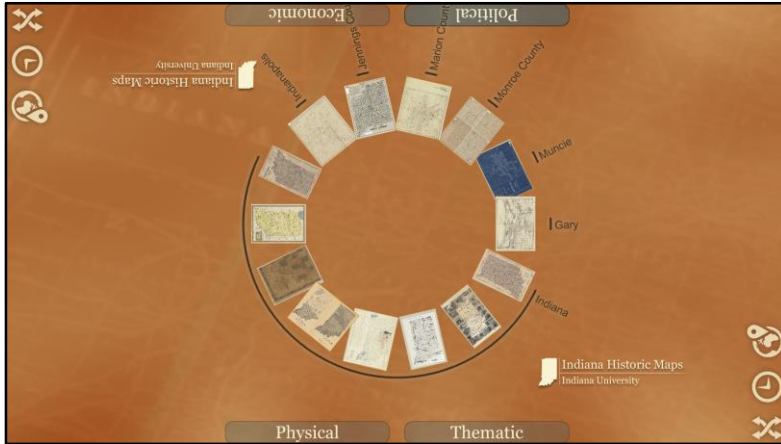


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# Use Case: Collection Viewing



- Your media & metadata
- Sorting & filtering operations
- Circular orientation around the table



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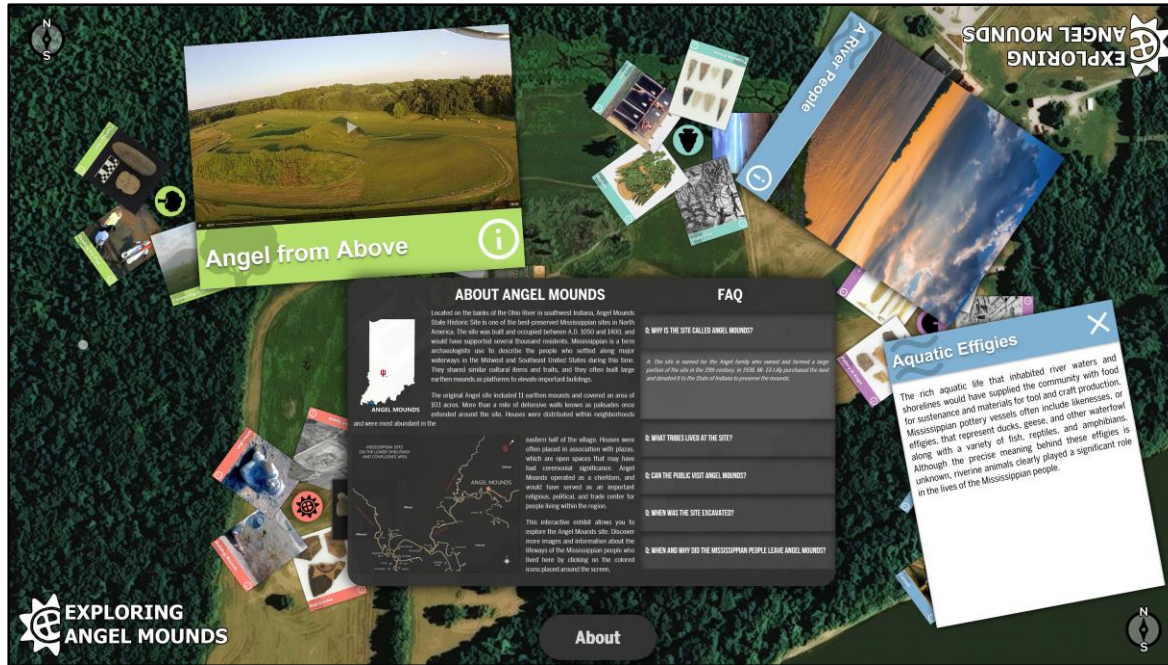


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# Use Case: Angel Mounds State Historic Site



- Collaboration with Glenn A. Black Laboratory of Archaeology
- Learn about the Angel Mounds site and Mississippian culture through high-resolution photos, videos, and metadata
- First installation of the IQ-Table v2 featuring Ultra High Definition resolution
- AVL's first multi-touch application built with web technologies (HTML, CSS, JavaScript)



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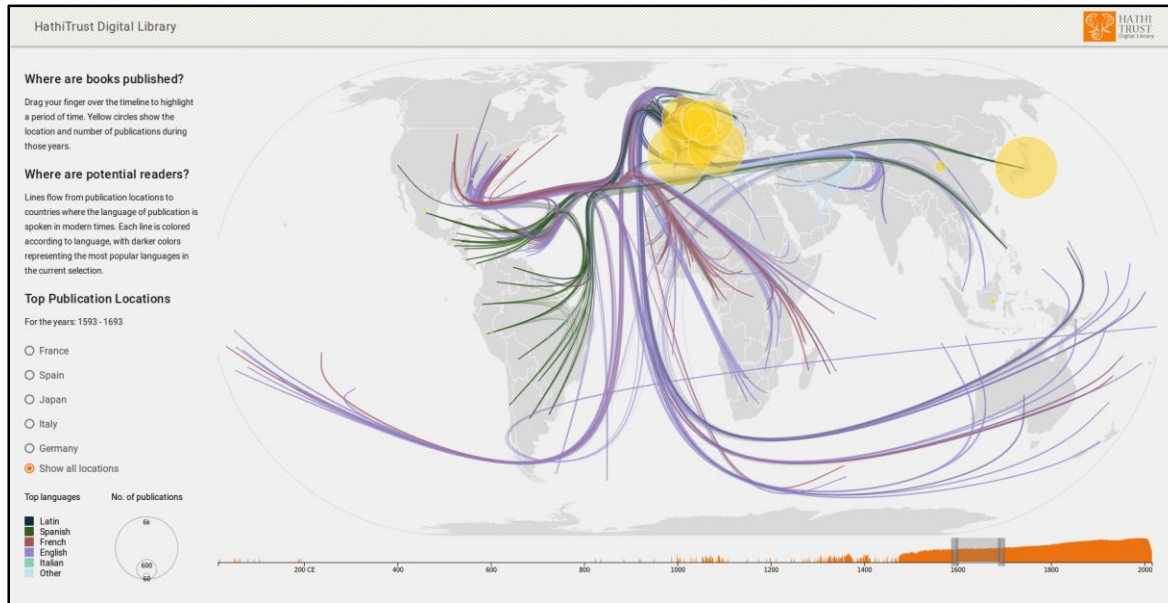
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# Use Case: HathiTrust Digital Library Macroscopic



- Collaboration with the IU Cyberinfrastructure for Network Science Center and the HathiTrust Research Center
- Part of the Places & Spaces: Mapping Science exhibit, Iteration XII
- When a user selects a time period, the map updates to show circles illustrating the locations and numbers of publications
- Curves flow out to countries where the publications' languages are spoken today



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# How to build touch applications?

AVL recommends web technologies

- Recent maturation of HTML/CSS/JavaScript
  - Including tools for entire workflow
- Accessible to most developers
- Deployable to most platforms
- Wide variety of pre-existing libraries and tools
- Support for many types of media



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# How to build touch applications?

- Very little effort for single-touch interaction
  - Just like a single-button mouse
- Multi-touch interaction requires gesture recognition
  - Tap, press, swipe, pan, pinch, rotate, etc
  - Some content (maps, 3D, etc) may natively support multi-touch gestures
  - Other content can be touch-ified with...



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# HAMMER.JS

*You can touch this*



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## Example step 1: AngularJS ng-repeat

```
<div>
  <md-card ng-repeat="awesomeThing in main.awesomeThings">
    
  </md-card>
</div>
```



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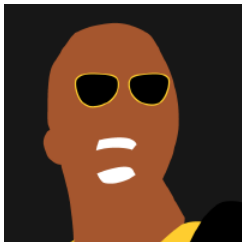




## Example step 2: Angular Hammer

Hammer gesture recognizers as Angular directives

```
<md-card hm-panmove="card.touchThis"
  hm-pinchmove="card.touchThis"
  hm-rotatemove="card.touchThis"
  hm-panend="card.cantTouchThis"
  hm-rotateend="card.cantTouchThis"
  hm-pinchend="card.cantTouchThis">
  
</md-card>
```



```
/**
 * Process touch event
 */
scope.card.touchThis = function (event) {
  var transform = scope.card.transform;

  newTransform = {
    translate: {
      x: transform.translate.x + event.deltaX,
      y: transform.translate.y + event.deltaY
    },
    angle: transform.angle + event.rotation,
    scale: transform.scale * event.scale
  };

  applyTransform(newTransform);
};

/**
 * Save transform
 */
scope.card.cantTouchThis = function () {
  scope.card.transform = newTransform;
};
```



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## Example step 3: Angular Material

- Implementation of Google's Material Design in Angular
- We primarily use it for the touch ripple, but also useful for layout, UI components, etc

```
<div>
  <avl-card ng-repeat="awesomeThing in main.awesomeThings | filter:main.query"
    thing="awesomeThing"></avl-card>
</div>

<div style="padding: 20px">
  <h1 class="md-title">Filter</h1>
  <div layout="row">
    <md-input-container>
      <label>Query</label>
      <input ng-model="main.query">
    </md-input-container>
    <md-button ng-click="main.query = ''">Clear</md-button>
  </div>
</div>
```



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## Example step 4: Google Analytics

- Use familiar web analytics for user tracking
- Automatic page view tracking
- Declarative event tracking

```
<md-button ng-click="main.query = ''"  
  analytics-on="click"  
  analytics-category="Filter"  
  analytics-label="Clear">Clear</md-button>
```



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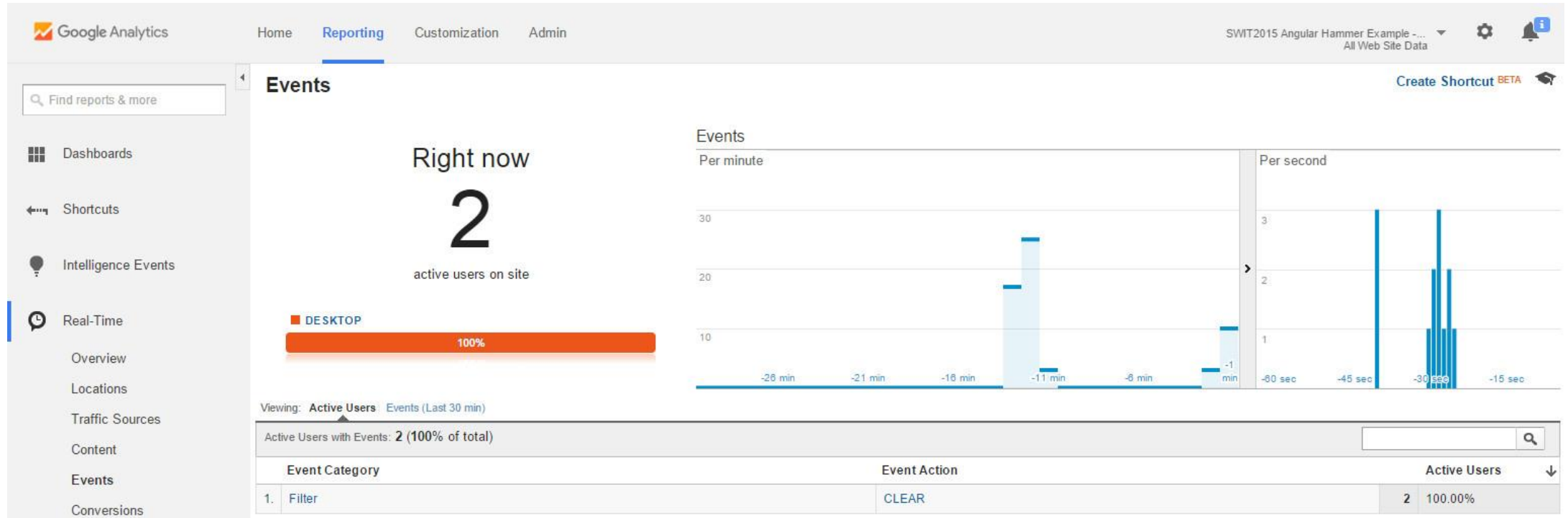


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## Example step 4: Google Analytics



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# How to deploy touch applications?

- Web browser
  - Kiosk mode
  - Run simple web server for local file access
- Desktop application
  - Use Electron to bundle your webapp with node.js and Chromium
- Mobile
  - Use Cordova to bundle your webapp for Android and iOS
  - Newer tools like NativeScript and React Native



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# How to deploy touch applications with Electron?

1. Clone dmreagan's *electron-kiosk* repo on GitHub: IU
2. Use “npm install” to install dependencies
3. Edit *index.js*
  - win.loadURL(`file://\${\_\_dirname}/app/index.html`) for local files
  - win.loadURL('https://mycooltouchapp.com') for web apps
4. Run “npm start” to test the app
5. Run “npm run build” to build executables for Windows, Mac, and Linux



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## How can the AVL help?

- Hardware lending and purchase recommendations
- Software development consulting, support, and training
- Need something advanced or custom? Contact us!

**avl.iu.edu**  
**vishelp@iu.edu**



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