

imageV2

and other

hgTracks UI Improvements

Tim Dreszer and Larry Meyer

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Talk Objectives

- “Drag Reorder”
 - demo, to be done
 - how it works
- “Drag Scroll”
 - demo, to be done
 - how it works
- imgBox details
 - hgTracks CGI integration
- Right Click
 - Demo
 - Technical details
- QA/Browser Strategy
- JS Support Proposal
- Additional discussion

“Drag Reorder”

□ Demonstration

<http://hgwdev-tdreszer.cse.ucsc.edu>

➤ Could be released soon!

- Slight differences between FF and IE
- Composite-level reordering works now
- Subtrack level reordering should be done! (discussion later)
- right-click to “save image” has original order

“Drag Reorder” how it works

- imgBox (in C structures)

[kent/src/hg/hgTracks/imageV2.h](#)

- sl of imgTracks which carry track definitions

- imgTbl (in HTML)

<http://hgwdev-tdreszer.cse.ucsc.edu> [view source](#)

```
<!-------vvv IMAGEv2 vvv----->  
<!-------^^^ IMAGEv2 ^^^----->
```

- Image is a table (imgBox => imgTbl)
- One row per track (imgTrack => row)
- row content is “slice” of an image (gif, png)
- Drag and Drop by [jQuery.tablednd.js](#)

“Drag Scroll”

□ Demonstration

<http://hgwdev-tdreszer.cse.ucsc.edu>

➤ Needs work

- Little blue stripes (png and clear image)
- 3x image and vertical spacing
- Next Item
- Scroll past end of image – ajax
- right-click “save image” must generate new image

“Drag Scroll” how it works

- imgBox (in C structures)
 - kent/src/hg/hgTracks/imageV2.h
 - sl of imgTracks which carry track definitions
 - sl of imgSlices, currently three: side, center and data
- in HTML: imgSlice

```
<table id='imgTbl'>
  <tr id='tr_knownGene'>
    <td id='td_data_knownGene'>
      <div style='overflow:hidden;'>
        <MAP name='map_data_knownGene'>
          <img id='img_data_knowngene' src='trash/tmpFile.png'
            style='position:relative; left:-1200px; ... >
```
- Javascript manipulates ‘style:left=?’
 - is homegrown, but tricks learned from [jquery.panFullSize.js](#)

imgBox details

imgBox <table id='imgTbl'>

imgTrack <tr>

<td>

```
imgSlice "side"  
<map>  
<img>
```

<td>

```
imgSlice <map> <img> "center" label
```

```
imgSlice "data"
```

```
<map>
```

```
<img src=[ common.png | unique.png ]  
style='position:relative; left:-1200px; top:-32px; '>
```

imgTrack <tr>

imgTrack <tr>

imgTrack <tr>

hgTracks CGI integration

- Low Impact. Minimize code changes.
 - `imageV2.c` and `imageV2.h`
 - `hgTrack.c` `#ifdef IMAGEv2_UI`
- Build structures instead of HTML
 - Inside `makeActiveImage()`
 - “`curlImgTrack`” and “`curSlice`”
 - Hated globals: “`theImgBox`”, “`curMap`”
- Write out HTML when “`theImgBox`” structure is complete. (`imageBoxDraw()` at end of `imageV2.c`)
- To be done:
 - Flatten track list for subtrack reordering
 - Generate right-click save image
 - Stripes background for drag-scroll
 - Ajax replace one track; ajax get new image
 - Integrate with Larry’s work

Right Click in Track Image

The screenshot displays the UCSC Genome Browser interface in Mozilla Firefox. The browser window title is "Human chrX:151,021,911-151,048,370 - UCSC Genome Browser v213 - Mozilla Firefox". The address bar shows the URL: http://hgwdev-larrym.cse.ucsc.edu/cgi-bin/hgTracks?hgtgroup_map_close=0&hgtgroup_phenDis_close=1&hgtgroup_genes_close=0&. The browser's tab bar includes "Zimbra: Inbox", "Google", "NoScript - Ja...", "Human...", "Human chr17...", "Where can I...", "windows prin...", "floreTest.jp...", "CSS backgro...", and "Google".

The main interface features navigation controls at the top, including "move" buttons (left and right arrows), "zoom in" buttons (1.5x, 3x, 10x, base), and "zoom out" buttons (1.5x, 3x, 10x). Below these is a "position/search" field containing "chrX:151,021,911-151,048,370", with "jump", "clear", "size 26,460 bp.", and "configure" buttons. A chromosome ideogram for chrX (q26) is shown, with a red vertical line indicating the current position at approximately 151,048,370 bp.

The main track area displays a 20 kb scale for chrX. The track includes "UCSC Genes Based on RefSeq, UniProt, GenBank, CCDS and Comparative Genomics" (MAGEA5), "Gene Coordinates used for Analysis" (Human mRNAs from GenBank), "Vertebrate Multiz Alignment & Conservation (44 Species)", "Repeating Elements by RepeatMasker", "control peaks", "control signal", "MI63 peaks", "MI63 signal", "siRNA peaks", "siRNA signal", "ER peaks in MCF-7 from Carroll et al. 2006", and "p53 peaks in HCT116 from Wei et al. 2006". A right-click context menu is open over the track image, with options: "hide", "dense" (checked), "squish", "pack", "full" (highlighted), and "Conservation controls".

At the bottom, there are "move start" and "move end" controls, each with a "2.0" value and left/right arrows. A descriptive text reads: "Click on a feature for details. Click or drag in the base position track to zoom in. Click gray/blue bars on left for track options and descriptions." Below this are buttons for "default tracks", "hide all", "add custom tracks", "configure", "reverse", and "refresh".

Right Click in Track Image

- Replaces generic browser right-click/context menu
- Demonstration

<http://hgwdev-larrym.cse.ucsc.edu/>

Right Click Options

- Visibility (hide, dense ...)
- hgTrackUi controls (?)
- Ruler specific menus
 - Drag-and-zoom mode
 - Hilight mode (suggested by angie)
 - View image (possibly -> an improved PDF/PS page)
- Context sensitive items
 - Show whole gene/feature

Right Click – technical details

- Backwards compatible
 - Uses existing `<map>`
 - Slight modifications to hgTracks
- Hides are instantaneous (manipulates DOM)
- Updates just the track image when possible
 - Saves 100k+ in hgTracks response
 - Speeds up re-rendering
 - Update of just a single track is

Right Click – tech (cont.)

- Improved UI and code that retrieves single tracks motivates improving hgTracks speed
 - Track loading code: 200-300 milliseconds on hgwdev, 500-2000+ ms on RR

QA/Browser Strategy

Safari anecdote:

- drag-and-zoom was broken in Safari 4.0 for 2+ months due to a bug in Safari code. There was no possible workaround on our side without very substantial re-implementation.
- One of user's prodded Apple and they eventually found and fixed the bug (in AppleWebKit)

Lessons Learned

- Sometimes, you can't do anything when a JS dependent feature breaks in a browser
- You need a non-JS fallback

JS Support Proposal

- Support Javascript dependent features in current and previous versions of major browsers
 - FF 3.x and 2.x
 - IE 8.x and 7.x
 - Safari 4
- We make no attempt to support older versions or obscure browsers

JS Support Proposal (cont.)

- Maintain non-js fallbacks for critical functionality; e.g.:
 - 3x zoom
 - <map>
 - <<< and >>> navigation
- QA periodically verifies these features still work

How do we control what new features are active?

(A) Javascript config (“Enable Javascript based UI features”)

or

(B) configs for each feature (drag-and-zoom, drag-scroll, right-click etc.)

- Pro: richer feature set when user has to fallback on some features
- Con: Exponentially bigger development/testing matrix

Additional discussion

- Do we have to maintain “Show track controls under main graphic” config? (this complicates the right click code).
- Shall we flatten tracklist at image generation time (for subtrack reordering)? How will we identify grouped tracks
- Further options in “right-click”?
- ??

Thanks

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 - jquery.imgareaselect.js - Michal Wojciechowski
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