



Visualizing Change in Networks

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Understanding the Dataset

- This dataset is a mapping of the 1981 movie "Raiders of the Lost Ark"
- It is a dynamic meta-network containing 27 different time periods
- Each time period contains the same 19 locations and 9 characters
- Each differs from another in two ways
 - The links present/not present
 - The timestamp



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Visualizing Dynamic Meta-Networks

- ORA offers a few different methods of visualizing change in dynamic meta-networks
 - As trails in Loom
 - As trails in the Geospatial Visualizer
 - As trails in Reports
 - As a series of images in the Regular Visualizer
 - As measures over time/change detection
 - (You should have already gone over this)

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Trails

- Trails concern themselves with only a single network (and its source/target nodesets) as it evolves over time.
- Whenever we load a dynamic meta-network into one of the various Trails programs, it'll ask for such a network
- If you have a network with Source X and Target Y, we take that to mean X nodes are "moving through" Y nodes.

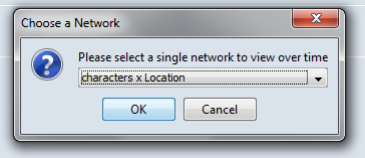
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Viewing Trails in Loom

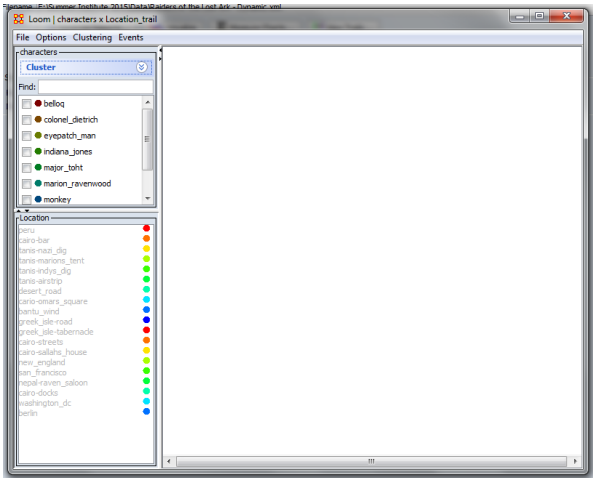
- Visualizations -> View Trails
- It'll ask for a network. Select the only one available



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Loom

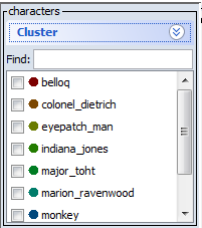


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Loom – Anatomy pt1

- The Source Nodeset panel
- Selecting the Checkboxes will cause that node to appear in the Loom
- Clicking on the colored circle will allow you to change the color of a trail
- The Cluster option can be used to group similar trails together.
- Nodes are sorted alphabetically




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Loom – Anatomy pt2

- The target node panel
- Grayed out nodes have no current trails going through them
- Clicking on the colored circle will allow you to change the color of a node's column
- There is a method to the sorting madness, but for all intents and purposes, consider it random

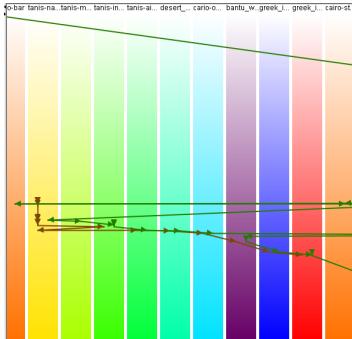


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Loom – Anatomy pt3

- The Loom
- Target nodes run left to right
 - (not really) random order
- Time runs top to bottom
- Slanted line represents transition
- Vertical line are stationary
- Horizontal lines are really really fast transitions
- Dotted lines represent breaks in data
- If a node was reported in the different places at the same time, a trail might look like it converges/diverges




tano-na, tano-m, tano-in, tano-al, desert, cario-o, banlu_w_greek_j, greek_j, cario-it

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Options - Timeline



tano-na, tano-m, tano-in, tano-al, desert_

1938/11/02
 1938/11/03
 1938/11/04
 1938/11/05
 1938/11/06
 1938/11/07
 1938/11/08
 1938/11/09
 1938/11/10
 1938/11/11
 1938/11/12
 1938/11/13
 1938/11/14
 1938/11/15
 1938/11/16
 1938/11/17
 1938/11/18
 1938/11/19
 1938/11/20
 1938/11/21
 1938/11/22
 1938/11/23
 1938/11/24
 1938/11/25
 1938/11/26

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Options – Bar Width

- Handy for fitting more locations in smaller areas

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Options – Stretch Vertical

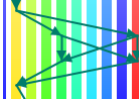
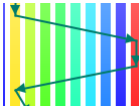
- Makes short duration transitions easier to look at

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Options – Allow Multiple Waypoints per period

- While this data doesn't have any, sometimes a source node can be connected to multiple target nodes at a given time period.
- This could be because they were technically in both (I am currently in both Pittsburgh and Pennsylvania), time periods were aggregated, or we're looking at something more abstract (Belief systems moving through locations)
- If this option is disabled, it chooses the location the node is most strongly connected to

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Loom Data Export

- Transition/Visit/Colocation Matrix
 - Uses the same source/target nodes, and creates three new networks
 - Transition – Creates a link between two targets if a node ever went from one to the other
 - Visit – Creates a link from a source to a target if a source was ever linked to that target
 - Colocation – Creates a link between two sources if they ever occupied the same target at the same time

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Loom Data Export

- Trail Matrix
 - Collapses the dynamic matrix into a single matrix.
 - Each source node is turned into a nodeset, and is given one node per time period
 - Each of these time period nodes is connected to the target node it was connected to at that time
- Visible Visitation Frequency Matrix

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View Trails in GIS

- Visualizations -> View Trails in GIS...Select a Network to visualize, same as with Loom.
- Only this time it generates a Trail Matrix that is opened up in our Geospatial Software

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What it Looks Like

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Trails Report

- It's run like a normal report. It's called Trails.

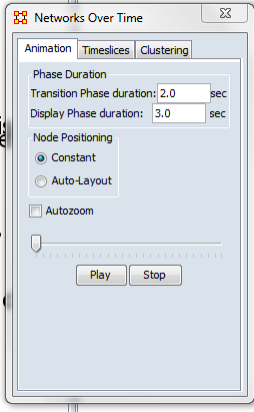
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Dynamic Meta-Networks in the Visualizer

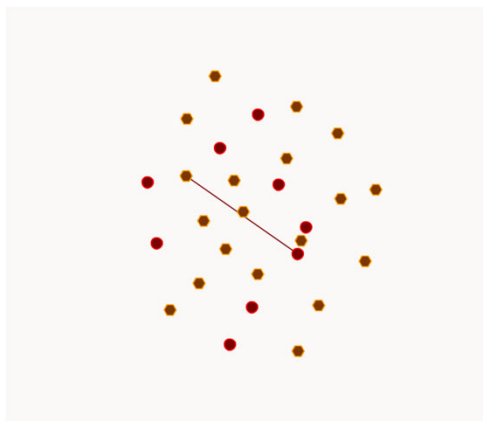
- Opening a dynamic meta-network in the visualizer opens up the Networks Over Time dialog
- It allows you to view it as a movies or jump around to various time periods



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The movie looks something like this



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