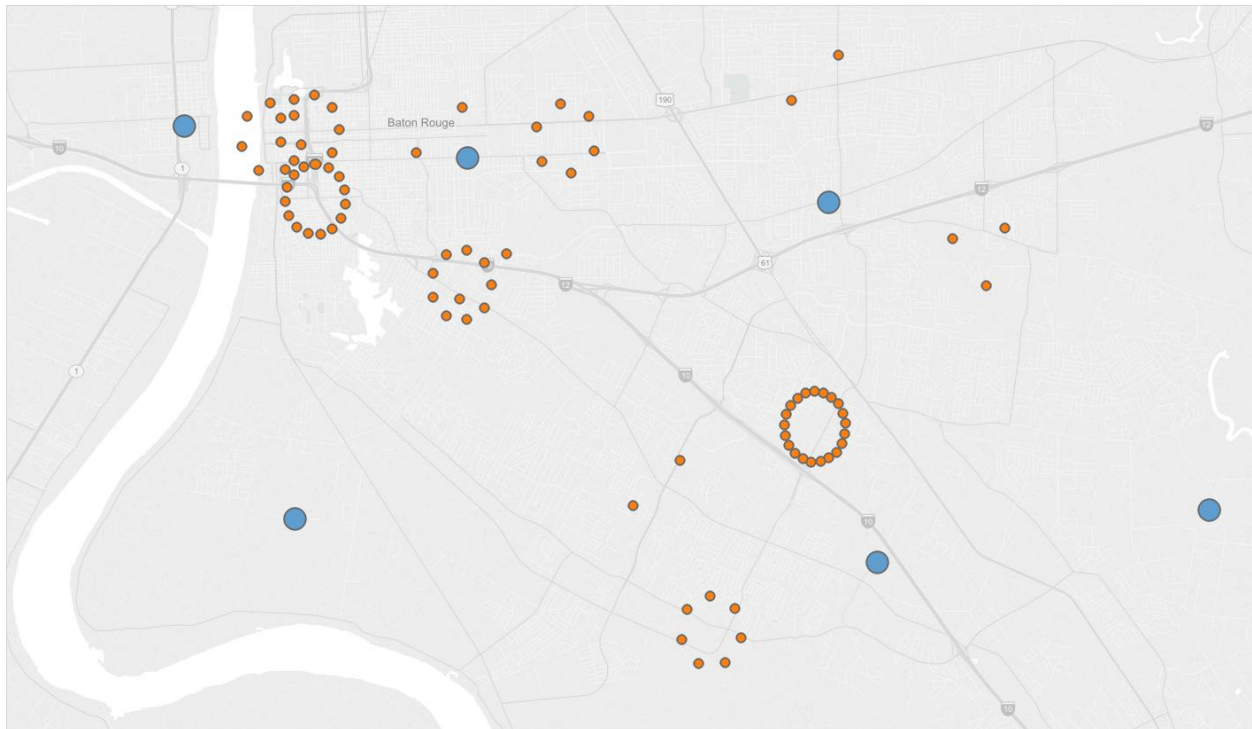


How to Use Jittering to Depict Multiple Data Points in the Same Geographic Location

Sometimes you want to depict multiple data points that have the same latitude/longitude values on a map at the same time. If you use Tableau's standard mapping strategies in these situations, all the data from a single geographic location will appear as one mark on the map, despite the fact that you have multiple points you want to display in a single location. One of the best techniques we have seen to handle this overlapping mark problem is called "jittering." You can "jitter" overlapping data points from the same geographic location so that they fan out into a circular pattern that is centered on the shared geographic location. The final result might look something like this:



Alan Eldridge created the original jitter technique:

https://public.tableau.com/profile/alan.e#!/vizhome/jitter_example/Jitterbug

The picture above was created from a notebook posted by Shawn Wallwork on a forum that discussed the jitter technique:

<https://community.tableau.com/thread/130929?start=0&tstart=0>

To implement the technique, you will need to create a number of calculated fields and parameters that describe different parts of the equations for a circle (since you are telling Tableau to fan the data points into a circular shape). The technique also requires either data blending or data joining. The specific steps are as follows:

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Jana Schaich Borg, PhD, Daniel Egger, JD

Step 1: You will need to use the latitude and longitude values that Tableau automatically generates for you in your jittering calculations. However, Tableau does not allow you to use its automatically generated latitude and longitude fields in calculations. To get around that, open your data source. Create a map of all the data points you want to be able to jitter (note that data points from the same geographic location will likely appear as one overlapping point on the map at this point; make sure your data are un-aggregated or are aggregated the way you intend by looking at the number of marks in your workspace at the bottom of your window). Right-click on the map to view the raw data. Make sure the data look the way you want them to. Export the raw data to a .csv file via the “export all” button on the upper right corner. Note that if Tableau cannot determine the latitude and longitude for any rows from the data you provide, those rows will have NULL or empty values in the exported file and will not appear on the map.

Step 2: Rename the new latitude and longitude columns in your exported file so that you will be able to differentiate them from the ones Tableau automatically generates. If your original data source was an Excel file, you have the option to insert your new exported file as a separate worksheet in your original Excel file.

Step 3: Open your modified exported file in Tableau as a new data source. If your original data and your new file are in the same Excel file, you can join the worksheets. If not, Tableau will nonetheless allow you to blend the two data sources. If needed, edit the relationships between your two data sources so that Tableau can blend them. Tableau will implement the blending as soon as one of the blended variables is used in the work space.

Step 4: Make a parameter called “spread_factor” and set it to 1. Make another parameter called spread_rotation and set it to 50.

Step 5: Make the following calculated fields (note that you will have to replace all the variables in brackets with the names of your own variables)...

Name: z_spread_distance

Calculation: [spread_factor]

Description: this is how far away the jittered points will be displayed from their original location

Name: z_spread_direction

Calculation: $6.283185 * \text{INDEX()} / \text{SIZE()} + (6.283185 * ([\text{spread_rotation}]/360))$

Description: This describes the angle at which each data point will be along the jittered circle.

$6.283185 = 2 * \pi$. INDEX() / SIZE() allows you to count how many data points you have in a single geographic location and spread the points out equidistantly along the circle.

Name: jittered_latitude

Calculation:

$\text{WINDOW_AVG}(\text{AVG}([\text{renamed_latitude}])) + ([\text{spread_distance}] * \text{SIN}([\text{z_spread_direction}]))$

Description: This will be the new jittered y, or latitude value, for each data point. It is based on the equations for getting the point along a circle when you know the radius and angle (see

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<http://gamedev.stackexchange.com/questions/18340/get-position-of-point-on-circumference-of-circle-given-an-angle>)

Name: jittered_longitude

Calculation:

$\text{WINDOW_AVG}(\text{AVG}([\text{renamed_longitude}])) + ([\text{spread_distance}] * \text{COS}([\text{z_spread_direction}]))$

Description: This will be the new jittered x , or longitude value, for each data point. It is based on the equations for getting the point along a circle when you know the radius and angle (see reference above).

Step 6: Make a combined “property_type” variable with the number_of_bedrooms and property_type variables (your name for these variables might differ). The variable should have 4 possible values: 1 BR/apartment, 2 BR/apartment, 1 BR/house, 2 BR/house.

Step 7: Start by putting all of your location variables (in our case, city, state, and zipcode) and property_id on the detail property of the marks card. Then put jittered_latitude on the rows shelf and jittered_longitude on the columns shelf. Press the map icon on the Show Me card. Choose a circle mark (or another mark, if you prefer) from the Marks card. Un-aggregate your measures. At this point you will still see single points. That’s because you need to tell Tableau how to compute the two jittered table calculations.

Step 8: There are multiple ways to set your table calculations up, but one of those ways is described here. Right-click on your jittered_latitude pill and choose Edit Table Calculation. Go to advanced options, and put all the variables in the addressing field. Then in the outer-most panel, specify that the calculation should be restarted again for every longitude value. **Make sure to set these preferences for both the latitude variable and the z spread direction variable, chosen by the calculated field drop down menu at the upper right of the window.** Repeat these steps for the jittered_longitude variable, but specify the calculation to start every latitude value. When you are done with this step, you should see many marks organized in circles across your map. If you don’t, double check all of your calculations and table calculation options.

Step 9: Once you are sure you have gotten the basic technique to work, place the property_type combined variable on the color property of the marks card to color-code each mark on the map according to its property type. You will have to adjust all of your table calculations options in order to get the marks to display correctly. Note that every time you add a variable to your work space, you will likely have to adjust the options on your table calculations to tell Tableau how to incorporate that variable appropriately into your calculations.

Now your map is ready to filter and format however you like!