Mapping API's: Leaflet - Getting Started with Turf.js

Bailey Hanson  
_Iowa State University_, bahanson@iastate.edu

Christopher J. Seeger  
_Iowa State University_, cjseeger@iastate.edu

Follow this and additional works at: [https://lib.dr.iastate.edu/gis_tasksheets](https://lib.dr.iastate.edu/gis_tasksheets)

Part of the [Geographic Information Sciences Commons](https://lib.dr.iastate.edu/gis_tasksheets)

**Recommended Citation**

[https://lib.dr.iastate.edu/gis_tasksheets/3](https://lib.dr.iastate.edu/gis_tasksheets/3)
Mapping API’s: Leaflet - Getting Started with Turf.js

Welcome to the Essential ArcGIS Task Sheet Series. This series supplements the Iowa State University Geospatial Technology Training Program short course series. The task sheets are designed to provide quick, easy instructions for performing mapping tasks.

Turf.js is an open source JavaScript library for advanced geospatial analysis that allows for spatial operations to be performed in the browser. Turf will help you analyze, aggregate, and transform data in order to visualize it in new ways and answer spatial questions. This task sheet will get you getting started with Turf.js and demonstrate the midpoint measurement and linestring helper functions. You can find the completed code for this task sheet at https://github.com/ISUEOGTP/GISTaskSheets/tree/master/Leaflet-Tutorials/turf-midpoints.html.

1. Introduction


   b. In order to share the Web map you create on the Internet, you will need to host the files on a Web server. For the purposes of this task sheet you can just create the file on your local hard drive and open it with your Web browser or use an Online editor such as jsbin.com or jsfiddle.net. These Online editors are easy to use and include colored code syntax and other helpful features. **Hint: this would be the preferred method for beginners.**

2. Add the Turf.js Library and Setup

   a. Within the HTML `<head>` tag add a `script src` link to the Turf JavaScript library. If you are using the basic leaflet map setup file from step 1a, then you will not need to do this step as it is already provided.

   ```html
   <script src='https://npmcdn.com/@turf/turf/turf.min.js'></script>
   //define two points
   lat1 = 42.03;
   lng1 = -93.68;
   lat2 = 41.96;
   lng2 = -93.55;
   //display points as markers
   var marker1 = L.marker([lat1, lng1]).addTo(map);
   var marker2 = L.marker([lat2, lng2]).addTo(map);
   ```
4. Turf.js Midpoint Measurement

a. The Turf.js midpoint measurement takes two points and returns a point midway between them. The midpoint is calculated geodesically, meaning the curvature of the earth is taken into account. The coordinates for point1 and point2 are the only required arguments for the midpoint measurement. A feature point, midway between point1 and point 2 is returned.

b. Define variables point1 and point2 as Turf point features. Create the variable midpoint to be assigned to the resulting midpoint that is returned by Turf.

   ```javascript
   //note the order of longitude and latitude is switched in turf.
   var point1 = turf.point([lng1, lat1]);
   var point2 = turf.point([lng2, lat2]);

   var midpoint = turf.midpoint(point1, point2);
   ```

   a. In order to add the midpoint to the map, a leaflet marker for the location myMidpoint needs to be created. Be sure to include .addTo(map) method.

   ```javascript
   //Add Turf result to map
   var myMidpoint = L.geoJSON(midpoint).addTo(map);
   ```

5. Turf.js LineString Helper

a. The Turf.js lineString helper creates a LineString Feature from an array of positions. An array of points, and an object of key-value pairs added as properties are the only required arguments for the lineString helper function.

b. Create a linestring1 variable and provide an array of the variables lat1, lng1, lat2 and lng2 as well as a key-value pair for the feature property.

c. In order to add the linestring feature to the L.geoJSON and map, use the addTo(map) method.

   ```javascript
   var linestring1 = turf.lineString([[lng1, lat1], [lng2, lat2]], {name: 'line 1'});
   L.geoJSON(linestring1).addTo(map);
   ```

Contact:

Bailey Hanson  bahanson@iastate.edu, 515-520-1436 or Professor Christopher J. Seeger, ASLA, GISP cjseeger@iastate.edu, 515-509-0651 for more information about the Geospatial Technology Program. This task sheet and more are available at www.extension.iastate.edu/communities/gis