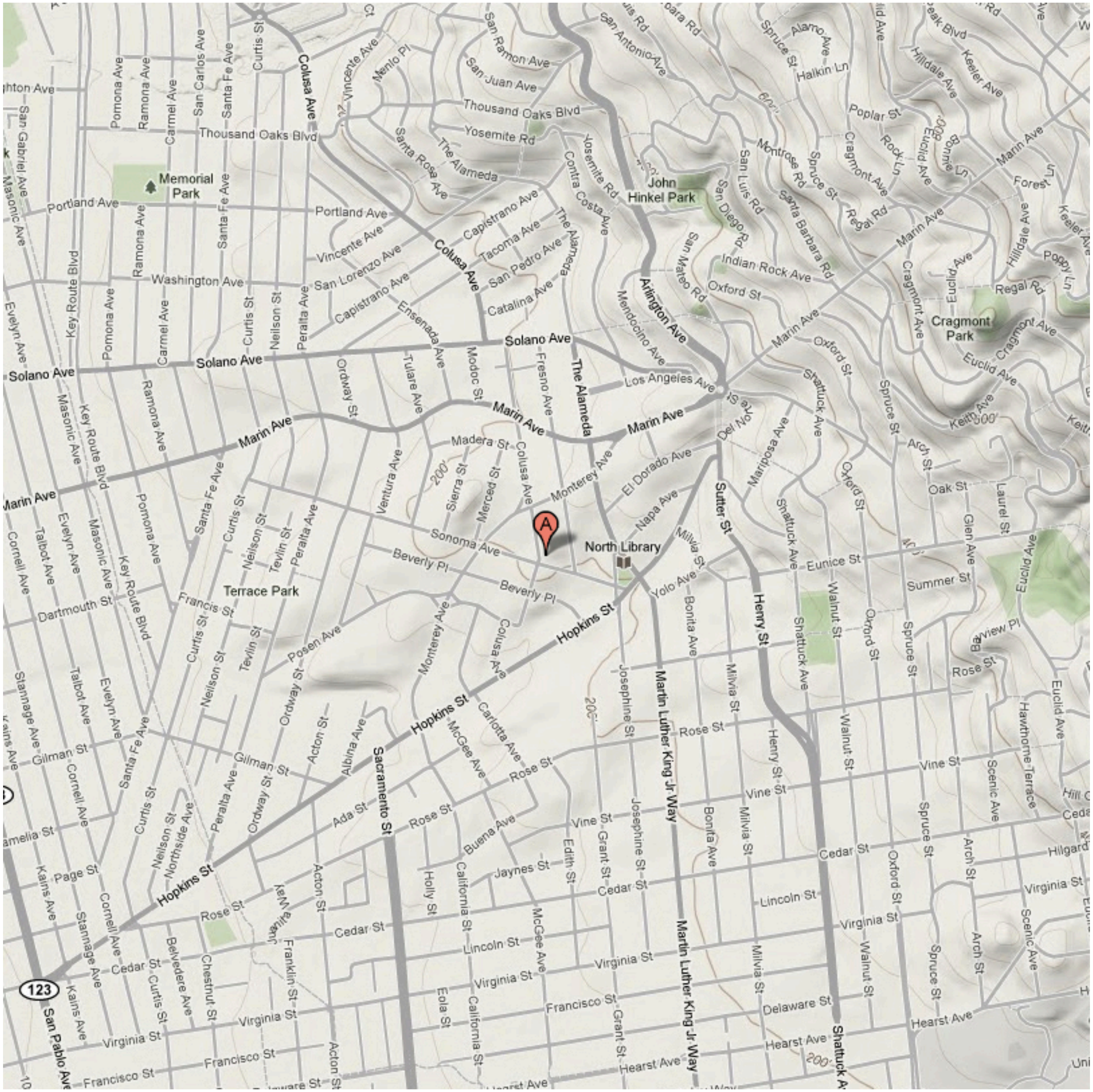
Distance-Cartograms for Navigation

Jon Barron

EECS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Cragmont Park
Terrace Park
North Library
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Marin Ave
Colusa Ave
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Washington Ave
Hopkins St
Sacramento St
Martin Luther King Jr Way
Shattuck Ave
Henry St
Sutter St
The Alameda
Arlington Ave
Sonoma Ave
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Neilson St
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Ordway St
Santa Fe Ave
Key Route Blvd
Masonic Ave
Ramona Ave
Pomona Ave
Carmel Ave
Los Angeles Ave
Indian Rock Ave
Capistrano Ave
Vincente Ave
San Lorenzo Ave
Catalina Ave
Tacoma Ave
San Pedro Ave
Contra Costa Ave
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Santa Rosa Ave
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Page St
Mariposa Ave
Summer St
Glen Ave
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Oak St
Arch St
Keith Ave
Regal Rd
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Hilldale Ave
Keeler Ave
Scenic Ave
Hawthorne Terrace
Hilgard
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Chestnut St
Franklin St
Belvedere Ave
Northside Ave
Edith St
Holly St
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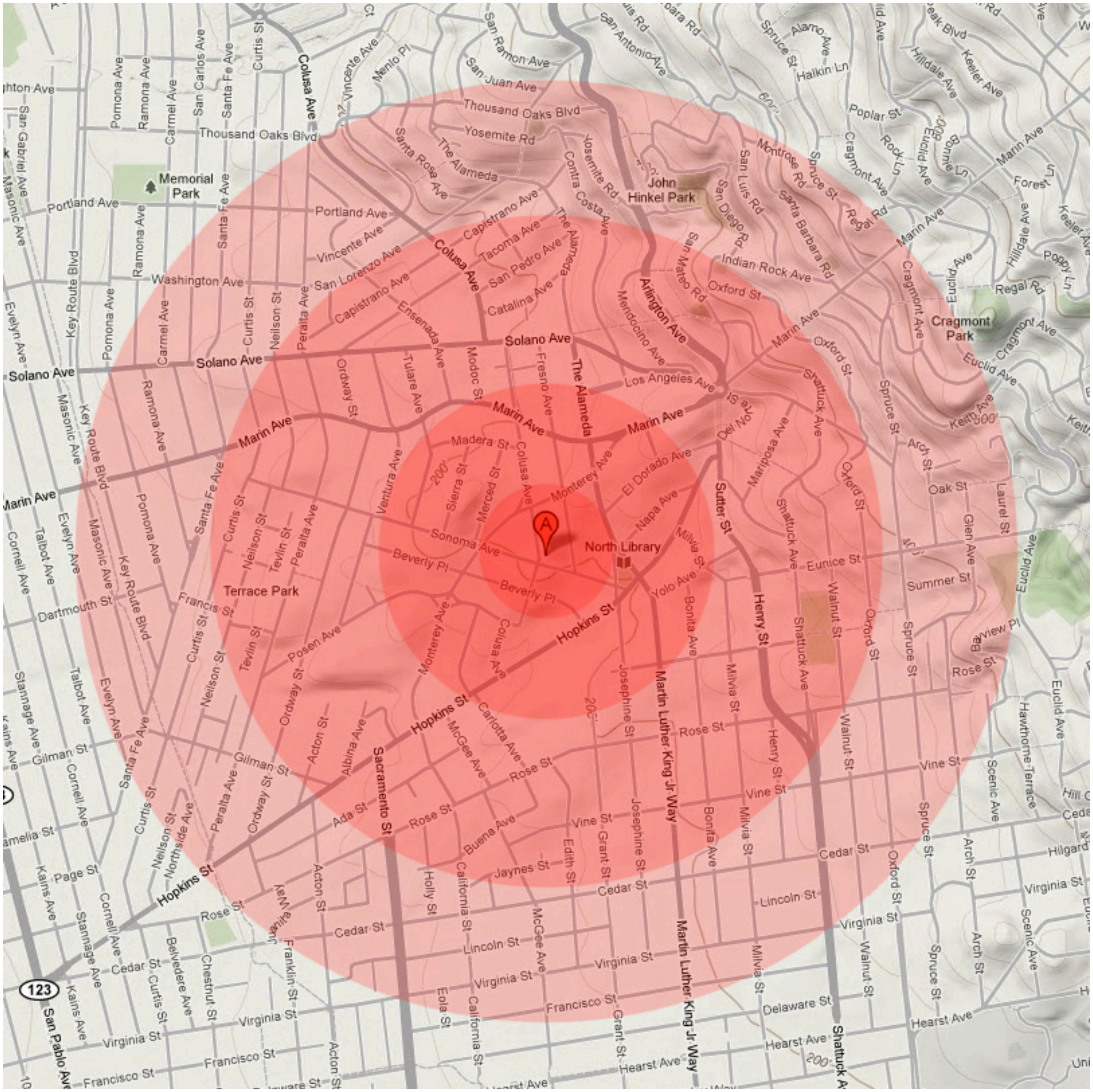

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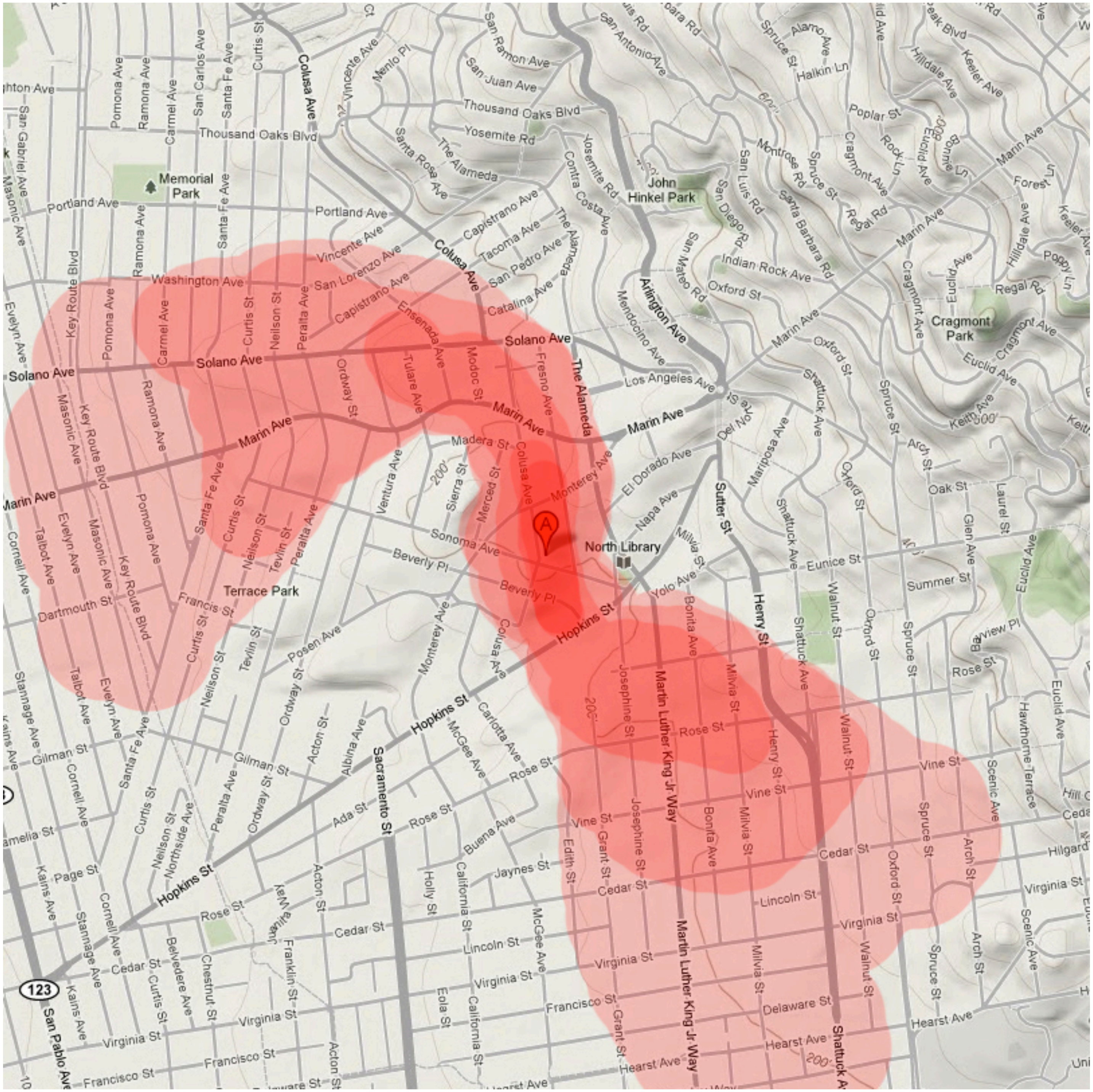

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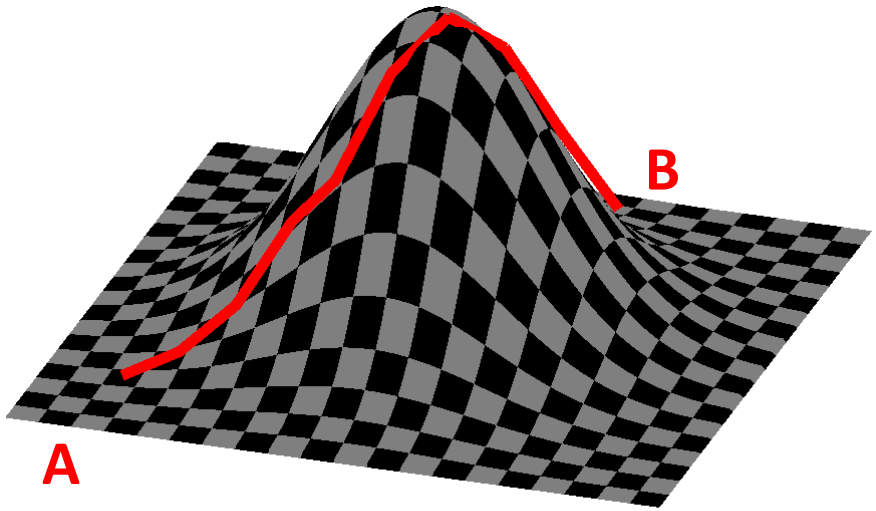
Goals

- Visualize my commute-able neighborhood
- Idea: encode using distance
  - Allows easy comparison
  - Intuitive?

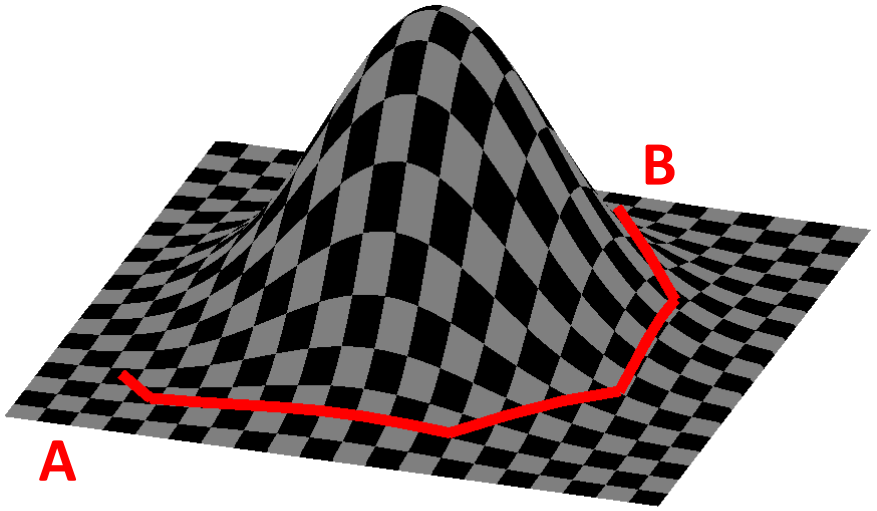
Figure 1.8 Airlines' view of the United States.
Maps can be scaled to units other than distance. In this case, airline fares are used instead of miles or other linear units.
(Map copyright by the author.)

Navigation (prior work)

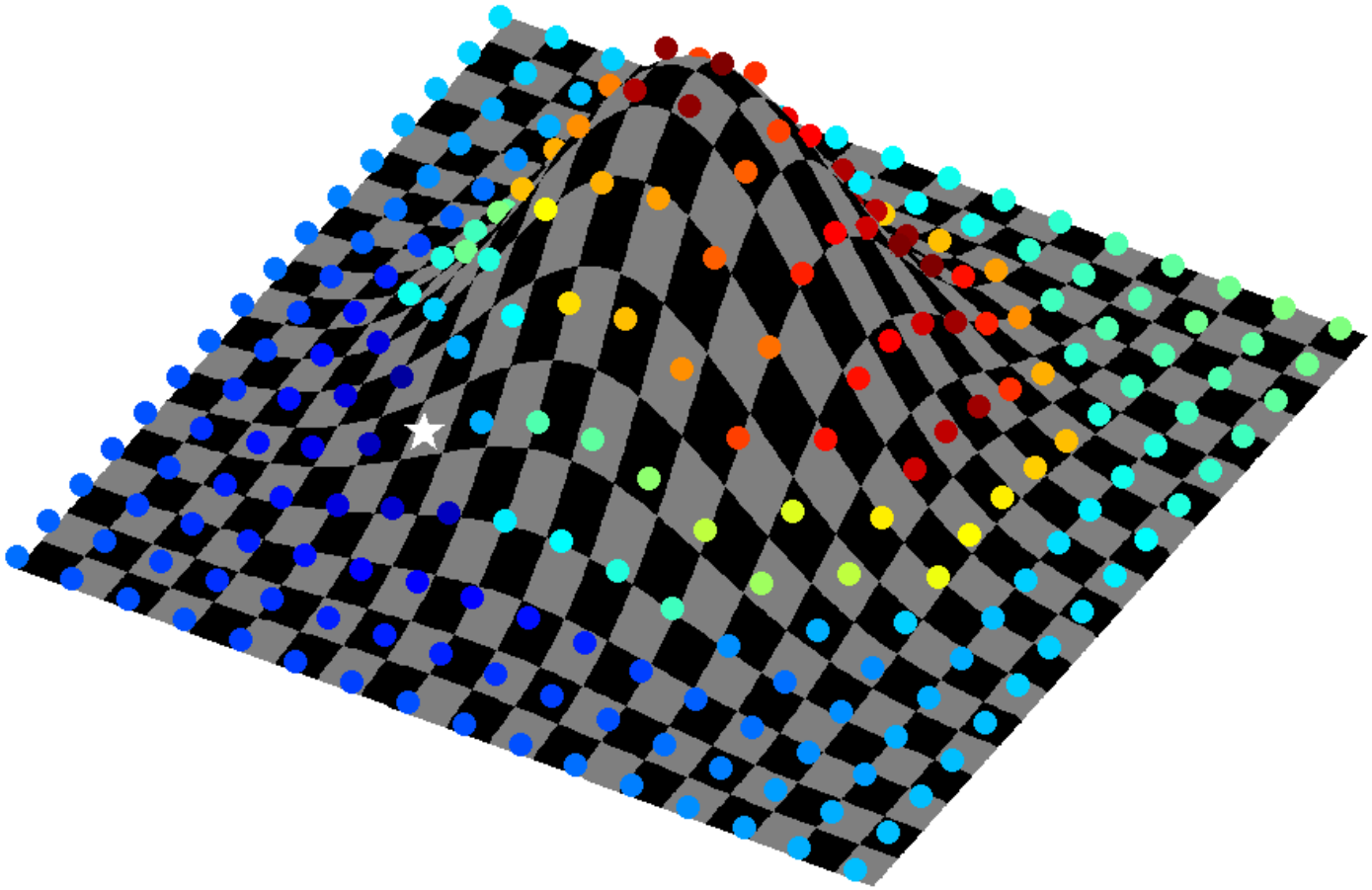
Time



Time + Effort



Round-Trip Distance



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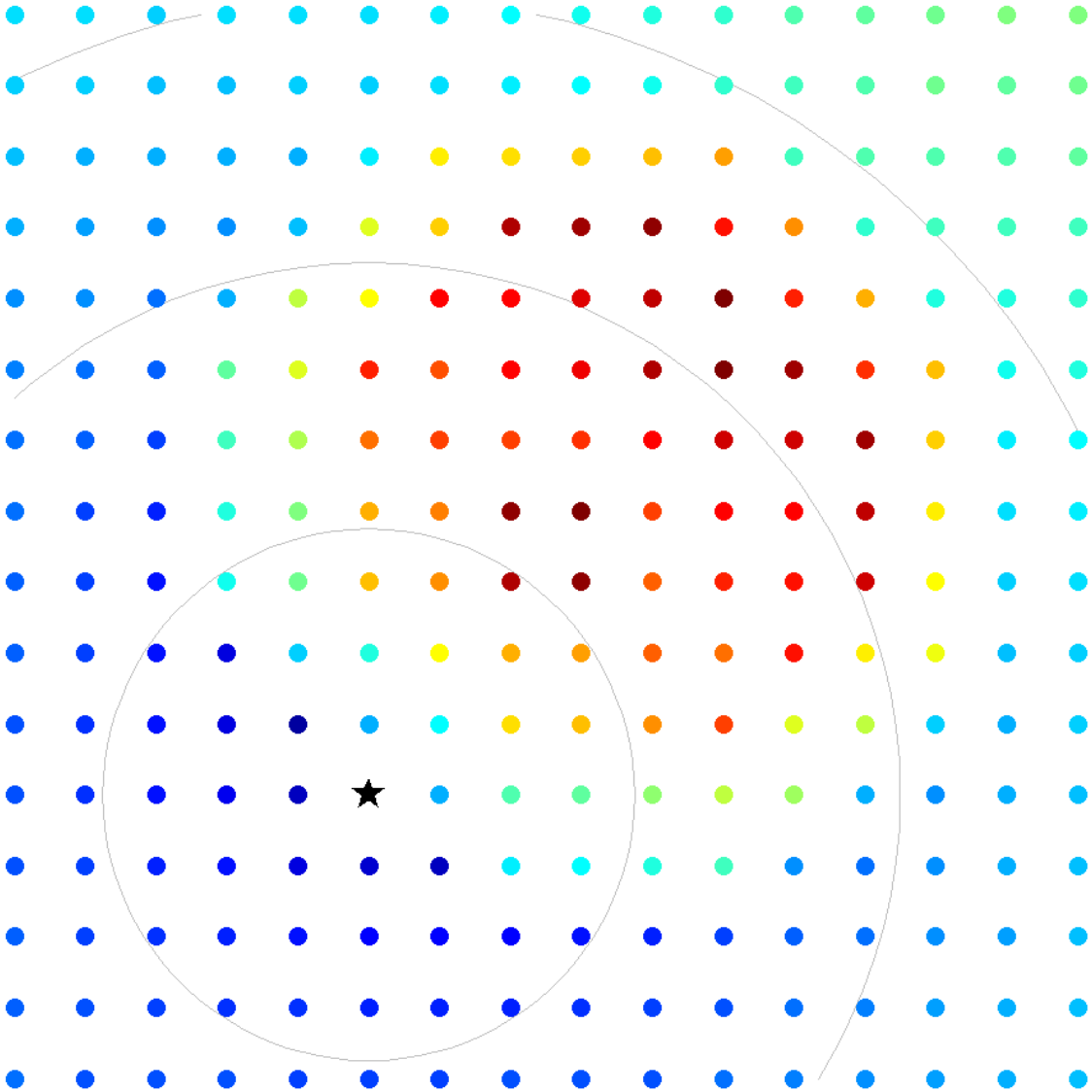
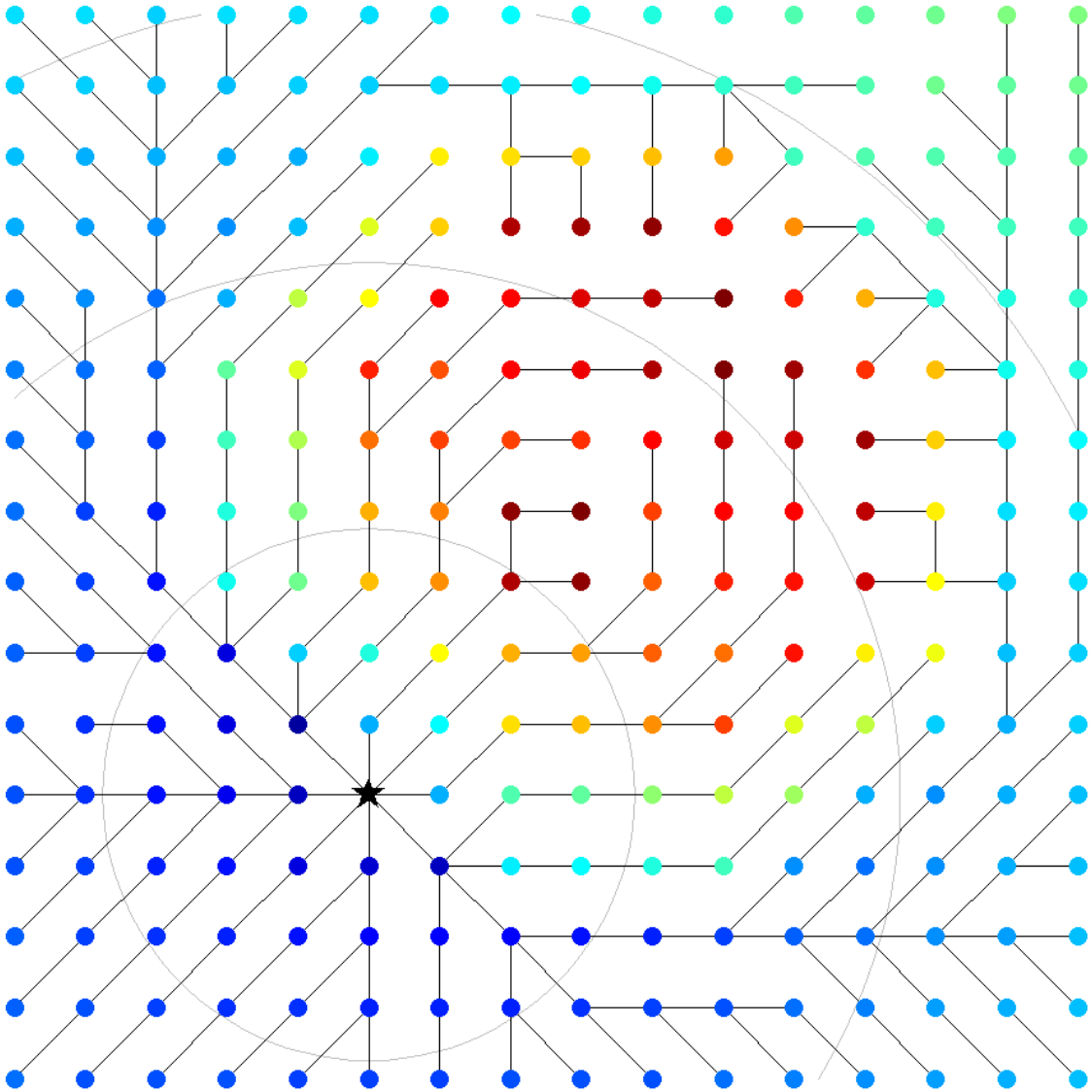
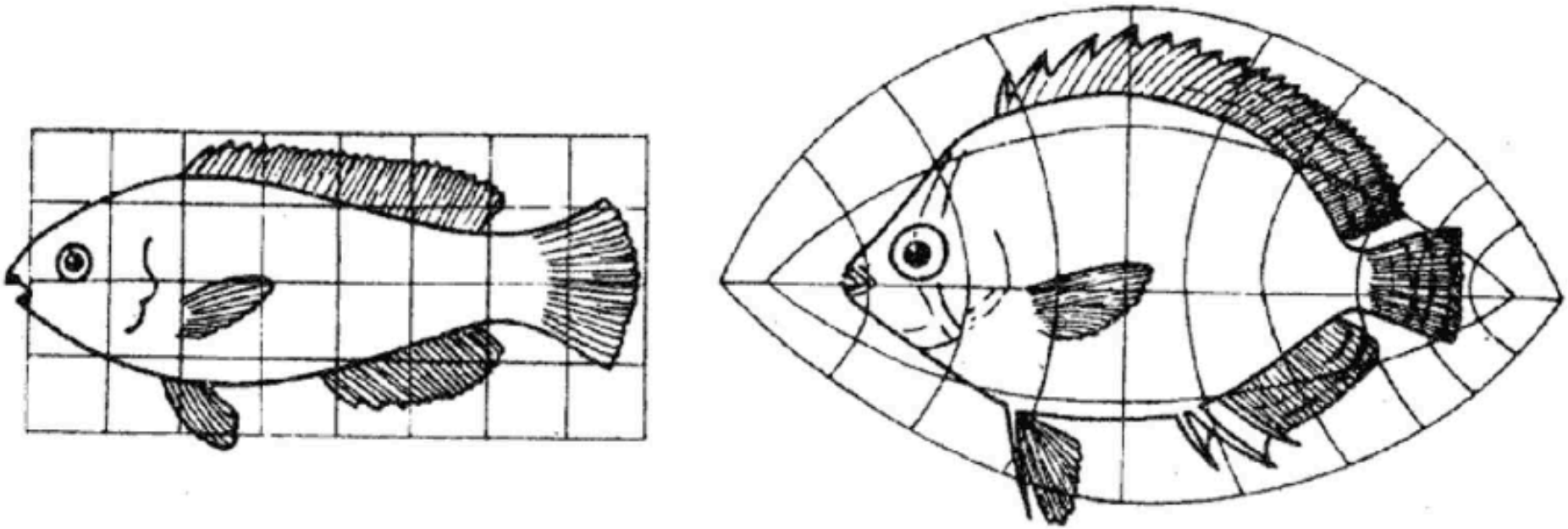


Round-Trip Distance + Shortest Path

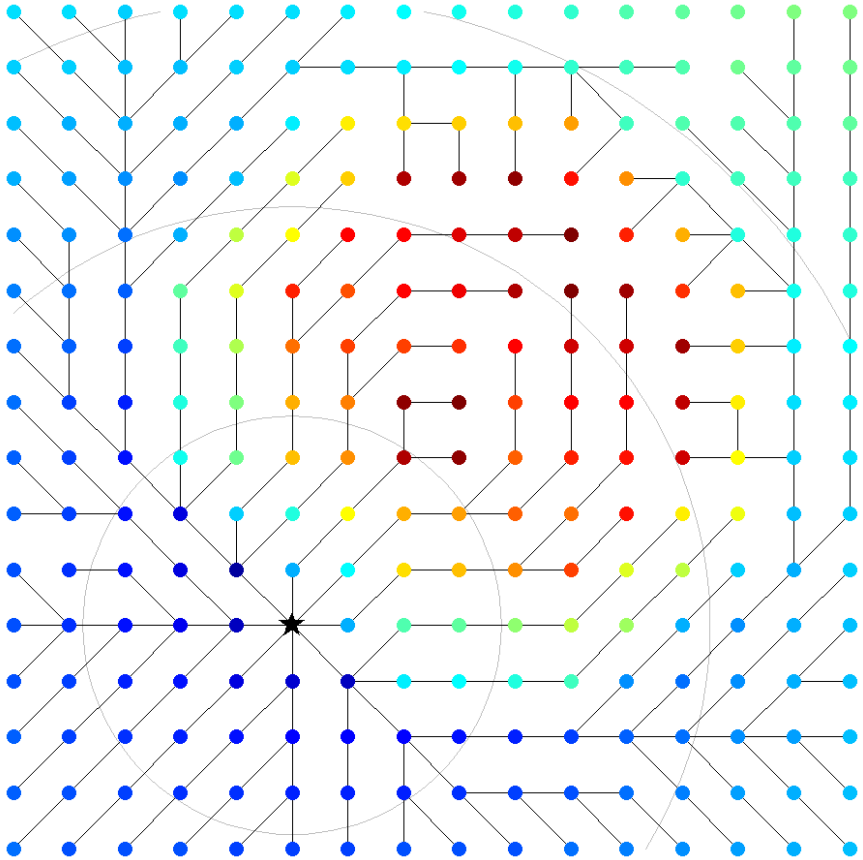


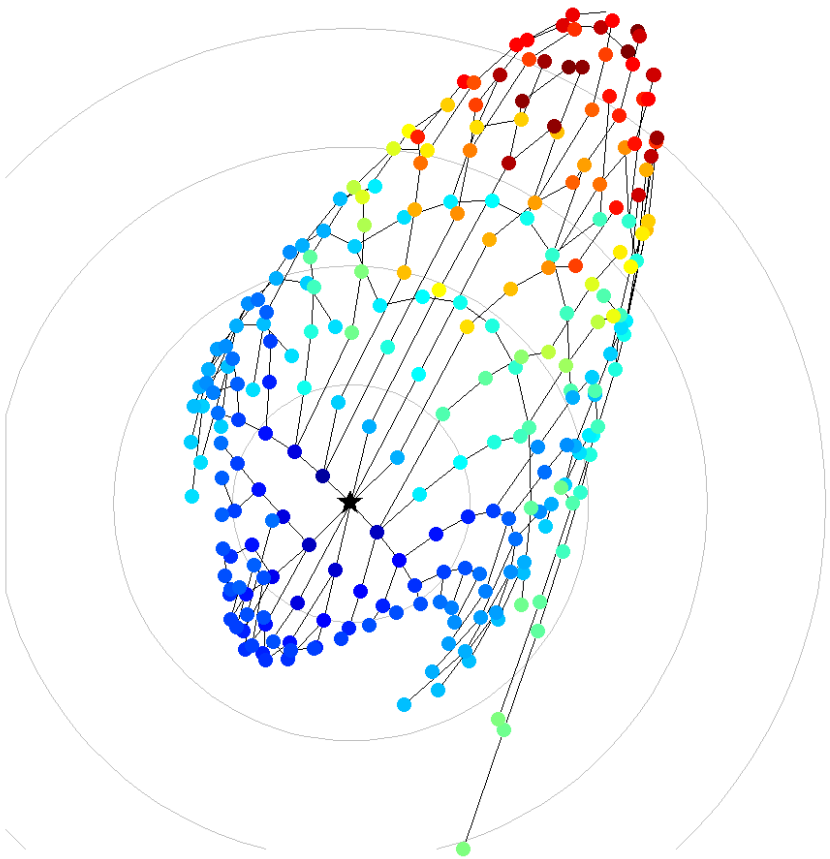
Idea 1: Warp the Surface



"Thin Plate Splines"

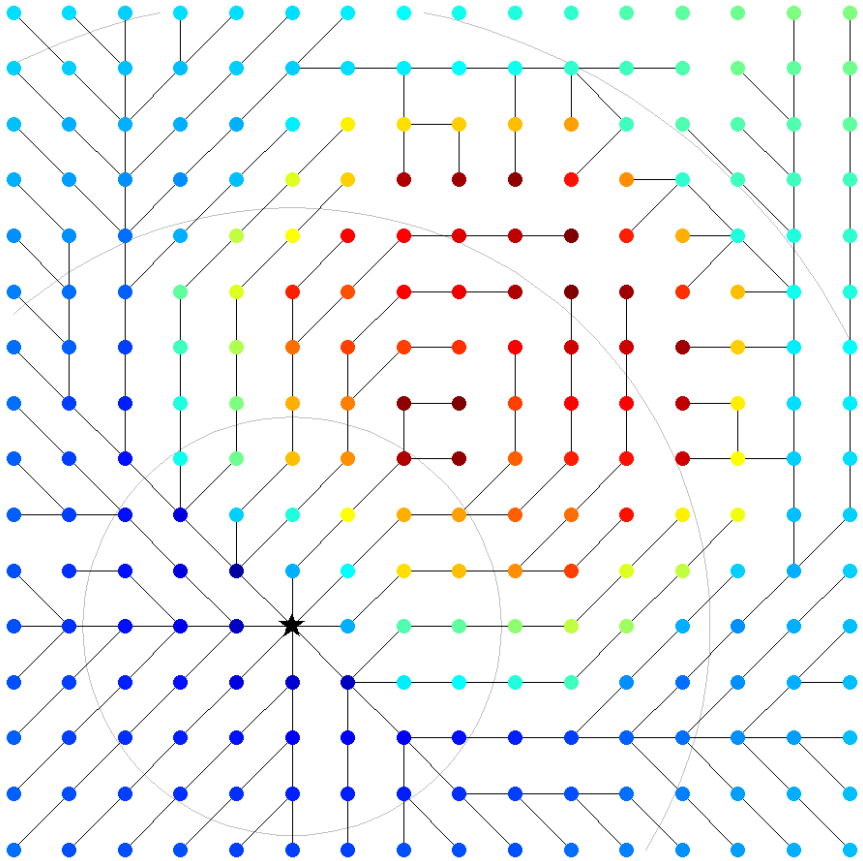
Idea 1: Warp the Surface

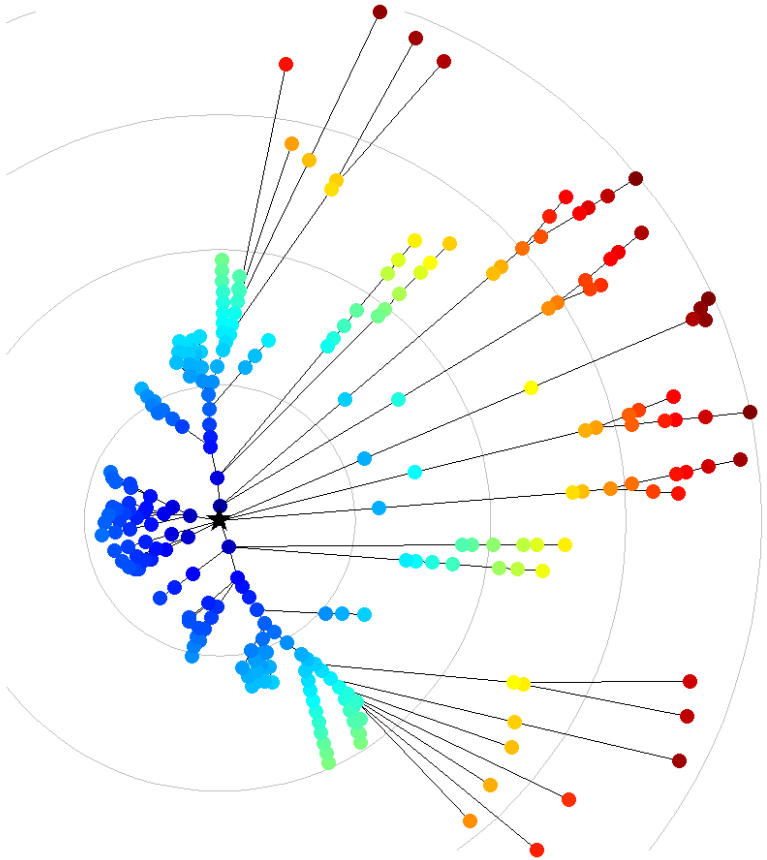




"Thin Plate Splines"

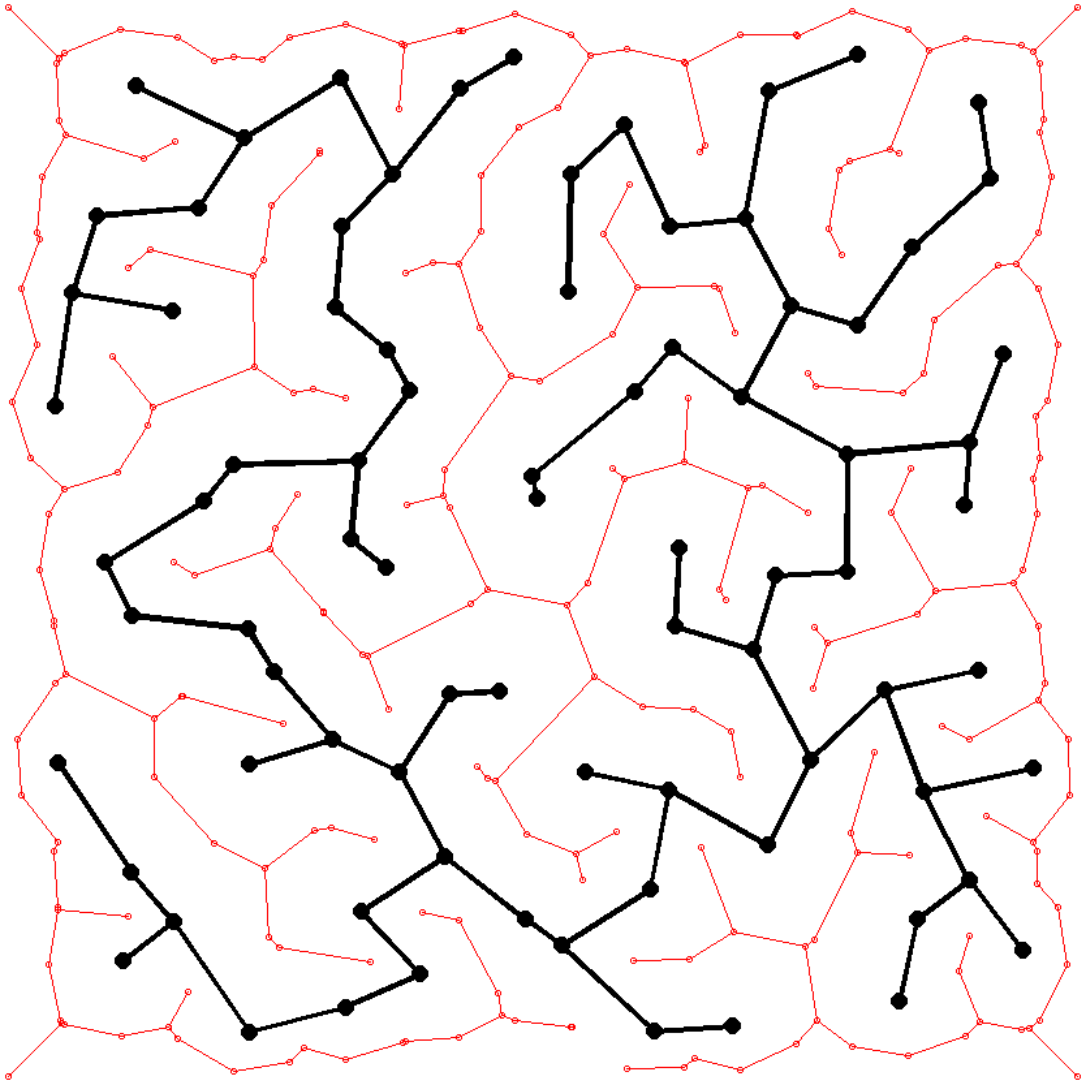
Idea 2: Warp the Tree





(then warp the map)

Idea 2b: Warping the map



Future Work

- Try more warpings
- Figure out how to warp the underlying map.
- Get guarantees on accuracy
- Try other transportation methods
  (Subway? Airplanes?)