UCGIS GIScience & COVID-19 Panel Session

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Geospatial efforts and research relating to COVID-19

At the Center for Geospatial Information Science (CGIS) we have been working on different aspects of COVID-19 related research.

**Junchuan Fan** has created


Point pulse map
Created using Leaflet, Mapbox and echarts. Data is from the JHU data repository.

3 layers are created every 6 hours based on the latest data:
- All counties with positive cases
- Top 10 counties with highest mortality rate and
- Top 10 counties that are increasing.
COVID-19 World Symptom Survey

- Joint Program in Survey Methodology (JPSM), CGIS from UMD and Facebook Inc.
- JPSM and Facebook
  - *survey design, sample selection, sample weighting*
- CGIS
  - Data pipeline for sharing symptom survey results with researchers and the public
    - public data API for aggregated survey results: data cleaning, data weighting, data aggregation -> public data API
    - individual micro data server

Junchuan Fan, Yao Li, Andres Garcia, Kathleen Stewart
Data pipeline

• Approx. 500k daily responses from over 3,000 regions and approx. 115 countries (55 languages...)

• Estimate *percent of population with COVID-like illness (CLI)* and *Influenza-like illness (ILI)* using survey responses and weights provided by Facebook

  **COVID-like illness** refers to a fever and at least one of the following: cough, shortness of breath, or difficulty breathing

  **Influenza-like illness** refers to a fever and both or either sore throat or cough

• Update database daily to allow researchers to query the database using public API
Geospatial Framework

- An open source web-based GIS framework that integrates public data API function with spatial data serving (e.g., WMTS, WFS)
  - OpenLayers + Geoserver + PostGIS + Flask

Sneak peek of country-level map

Percent of people with COVID-like symptoms
Sub-country level results will be also available

Percent of people with COVID-like symptoms
Geospatial efforts and research relating to COVID-19

• We are also undertaking research supported by NSF using passively collected location-based app data captured during the period of the pandemic to quantitatively measure change in collective movement behaviors
Outgoing trips in Miami-Dade, Broward, and Palm Beach counties by census tract

03/18/2020

05/06/2020
Outgoing trips in Miami-Dade, Broward, and Palm Beach Counties, 05/01/2020-05/10/2020 by census tract

COVID-19 Positive Cases
05/18/2020

Black Non-Hispanic Population

White Non-Hispanic Population

Legend
- County
- Black Non-Hispanic
  - 0 - 1120
  - 1121 - 3159
  - 3160 - 7943
- Trips
  - 0 - 8566
  - 8567 - 14601
  - 14602 - 22355
  - 22356 - 34458
  - 34457 - 64276
  - 64277 - 166998

Legend
- County
- White Non-Hispanic
  - 0 - 1327
  - 1328 - 3030
  - 3031 - 13749
- Trips
  - 0 - 8566
  - 8567 - 14601
  - 14602 - 22355
  - 22356 - 34456
  - 34457 - 64276
  - 64277 - 166998

COVID-19 Cases
- 0 - 23
- 24 - 60
- 61 - 166
COVID-19 positive cases for 05/15/2020 in Prince George’s County, MD

And environmental justice (EJ) index scores (census tract)
Collaboration with the SPH at UMD

- green space/distance to parks
- air quality
- walkability
- health-related variables

Prince George’s County
15,808 cases, 497 deaths (06/01/2020)