

Optimized Spatial Census Information Linked Across Time (OSCILAT)

Improving the spatial accuracy of 1990, 2000, and 2010 census microdata



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New Data, Two Components

1. Optimal longitude/latitude for **every** housing unit & person record in the 1990, 2000, & 2010 censuses
 - Enables high-precision spatial analysis & complete flexibility in neighborhood delineation
2. 2010 & 2020 block IDs for **every** record from the 1990–2010 censuses
 - Enables exact tabulations of 1990–2020 data for 2010 or 2020 census geography

Motivations

- Avoiding the Modifiable Areal Unit Problem (**a, b**)
- Constructing egocentric/bespoke neighborhoods (**c, d**)
- Generating data for important non-census geographic units (e.g., school attendance zones) (**e**)
- Standardizing spatial units for comparisons over time (**f**)
- Privacy protection in public data necessitates reporting aggregated data (**g**)

Objectives

- Retroactively apply the most recent and accurate information on address locations to earlier census data
- Make a data product available within the Federal Statistical Research Data Center (FSRDC) system to allow analysis while protecting privacy
- Future plan: Use OSCILAT to test the quality of publicly available standardized time series and report reliability metrics

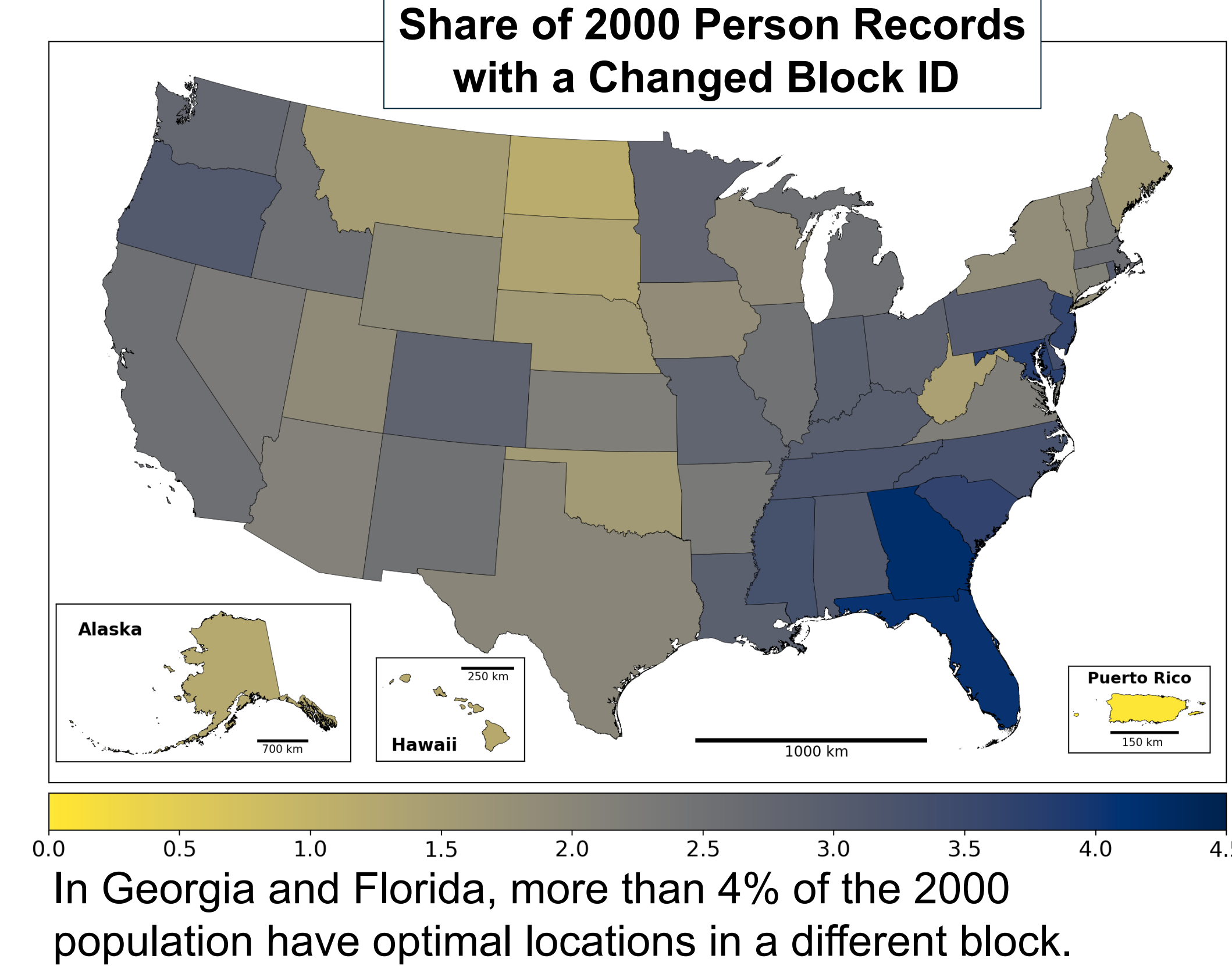
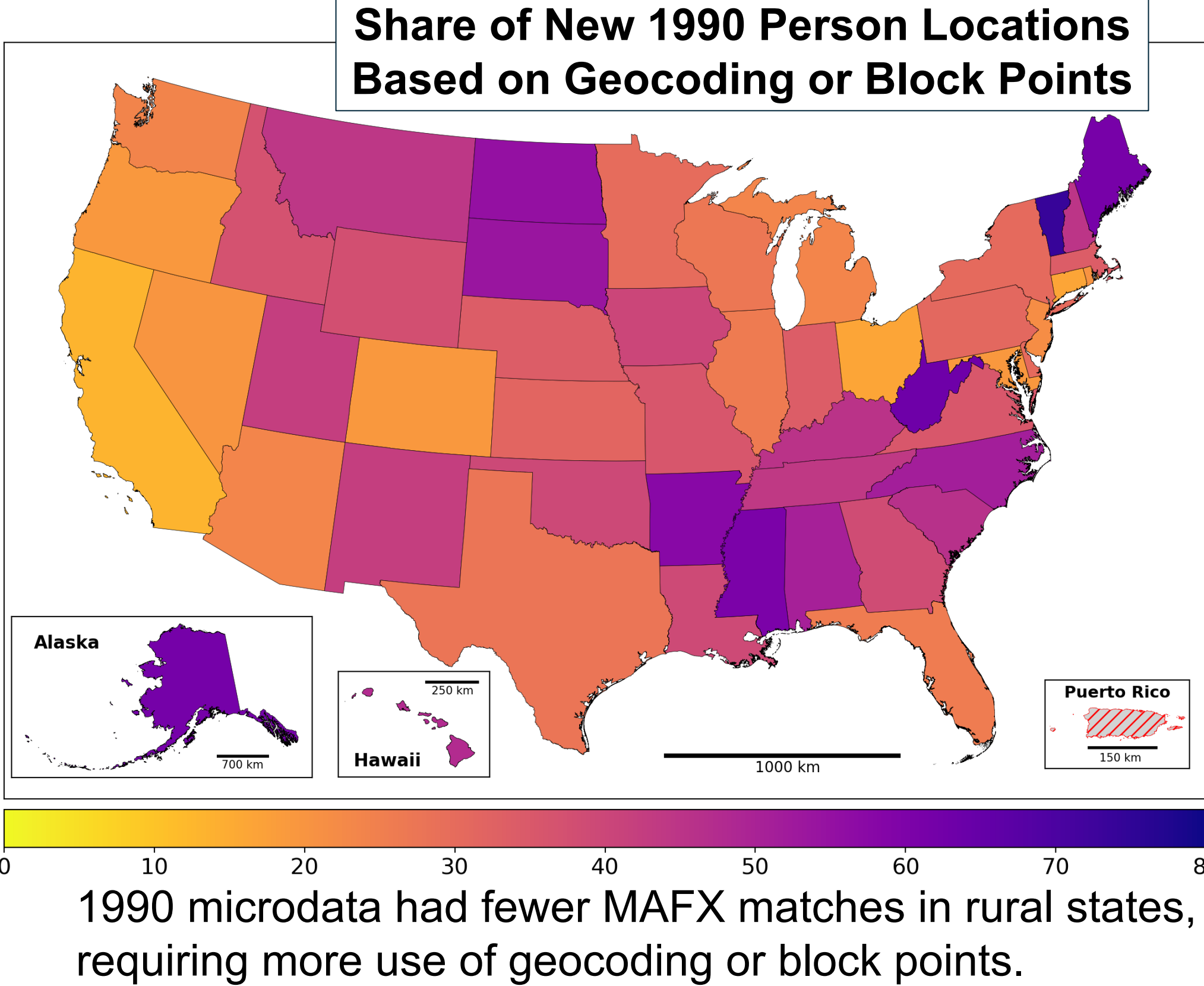
Millions of Improvements

Types of improvements in OSCILAT
Matched to Latest: If possible, we linked to the latest matching record in the Bureau’s Master Address File Extracts (MAFX).
Geocoded Address: For cases with no match in MAFX or where MAFX location was invalid, we applied new geocoding.
Used Block Point: For cases with no valid MAFX or geocoding result, we used a representative point in the tabulation block.
Changed Block ID: For cases where optimal location fell outside the official tabulation block, we assigned a new block ID.

Year	Data Type	Total Records	Matched to Latest		Geocoded Address		Used Block Point		Changed Block ID	
			N	%	N	%	N	%	N	%
2010	Population	312,473,000	300,809,000	96.3	6,253,900	2.0	3,701,300	1.2	1,716,950	0.5
	Housing	133,512,000	128,180,000	96.0	2,949,600	2.2	1,610,600	1.2	767,150	0.6
2000	Population	285,222,000	256,386,000	89.9	13,303,000	4.7	7,968,000	2.8	7,572,400	2.7
	Housing	117,320,000	105,320,000	89.8	5,837,350	5.0	3,108,200	2.6	3,058,100	2.6
1990	Population	248,714,000	174,576,000	70.2	15,066,000	6.1	59,070,000	23.8	*	*
	Housing	102,401,000	70,279,500	68.6	6,767,400	6.6	25,350,900	24.8	*	*

Record counts rounded for disclosure avoidance. *Not enough information available to evaluate block ID change in 1990.

Quality of Information Varied by State and Year



Potential Uses

- | FSRDC Internal | Public Facing |
|--|---|
| <ul style="list-style-type: none"> • Precise analysis of location and movement over time • Analysis of boundary impacts • Linkages with analyses based on other geographies | <ul style="list-style-type: none"> • Adjudicate quality issues among existing tools for longitudinal analysis • Confirm findings based on public sources of aggregate data using alternative aggregations |

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