

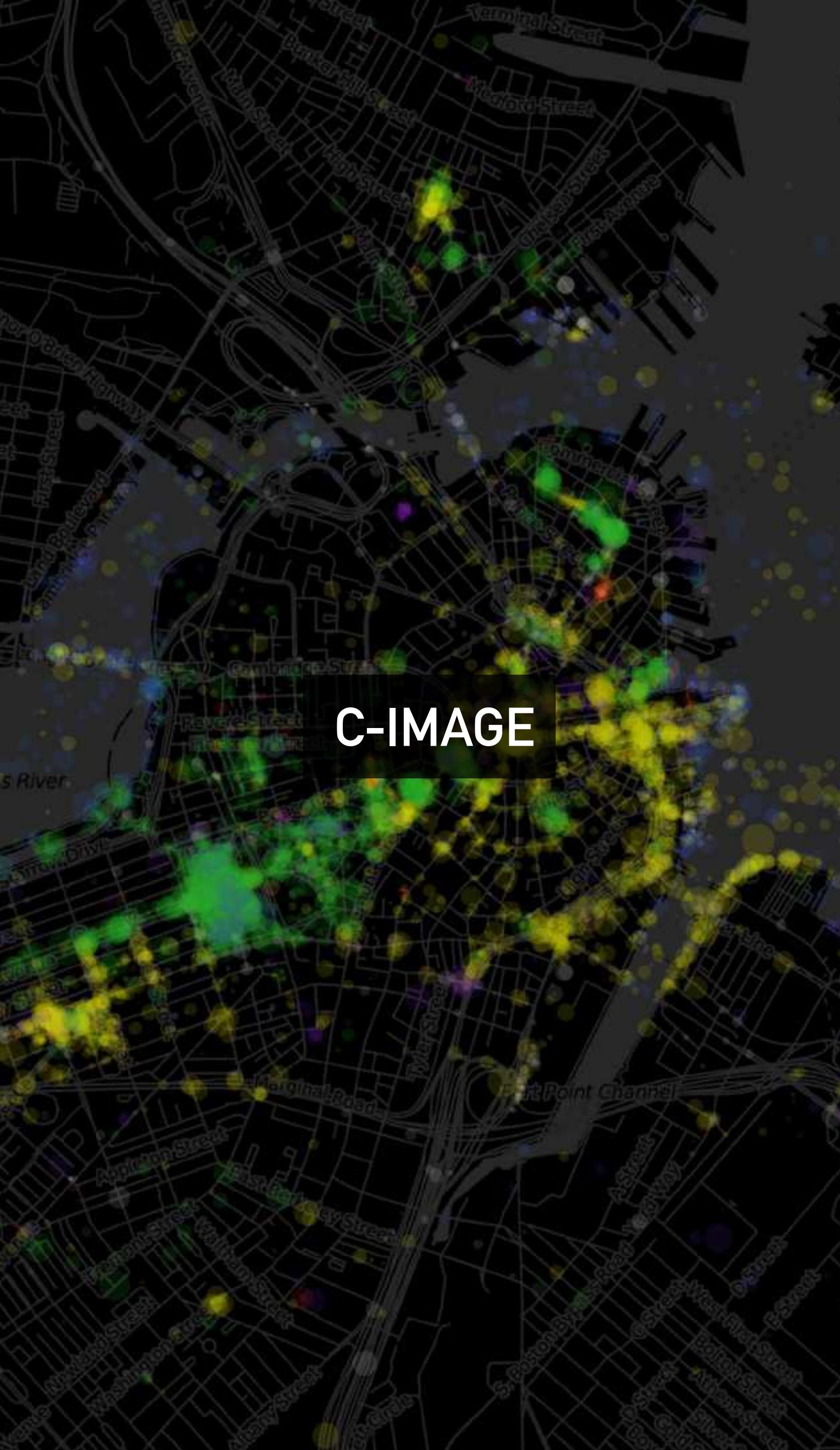
Mapping with Images

Liu Liu, 2023.07



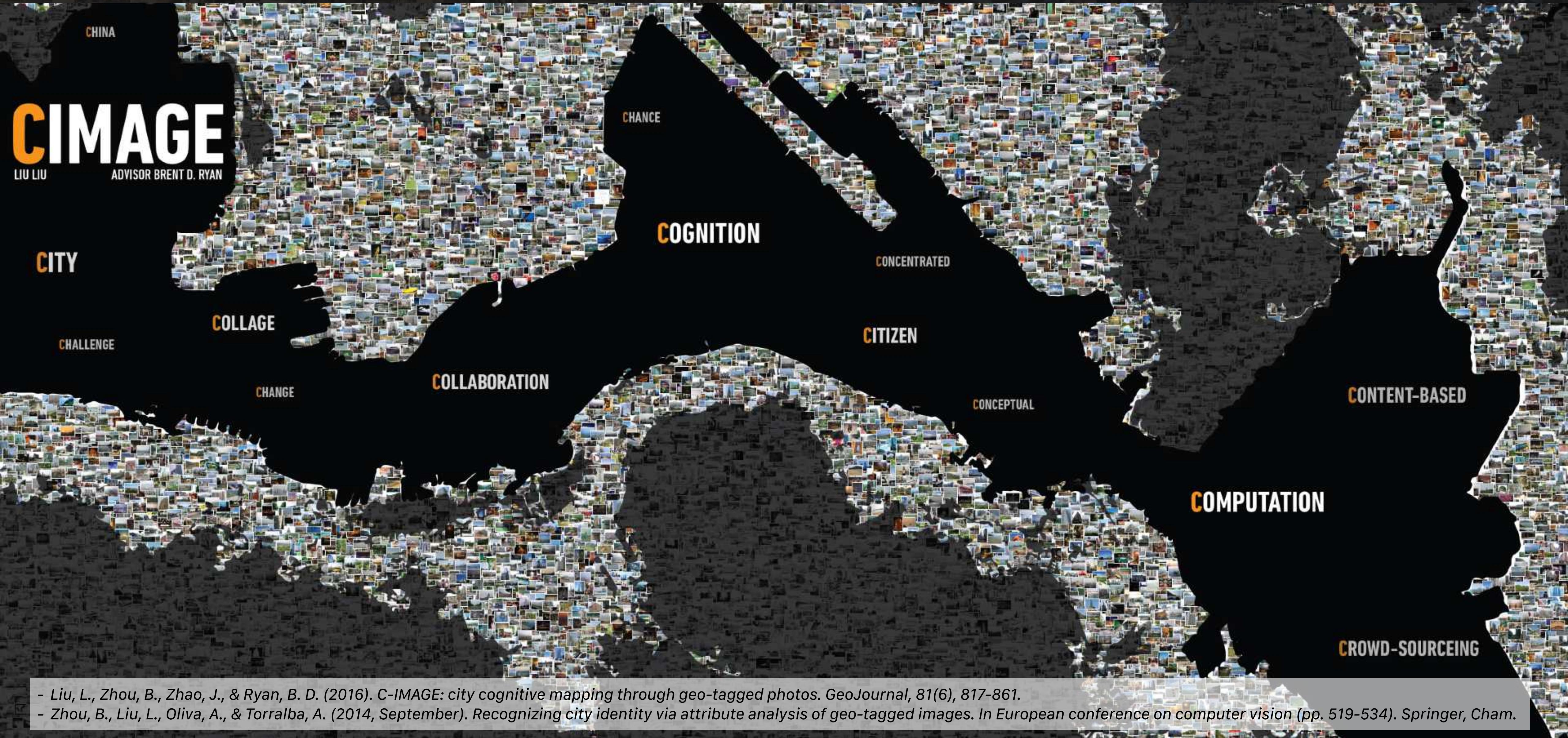
Richness of Images

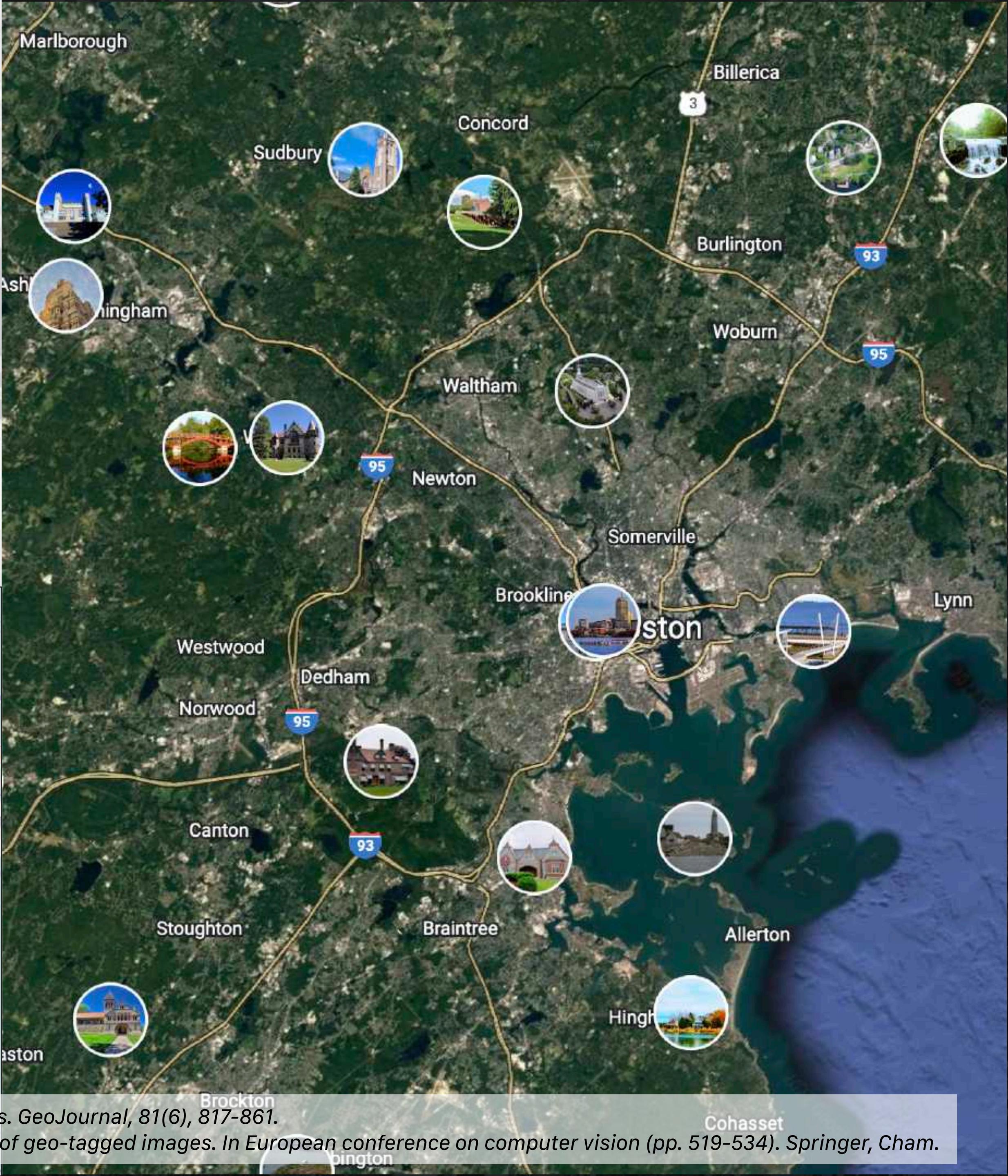
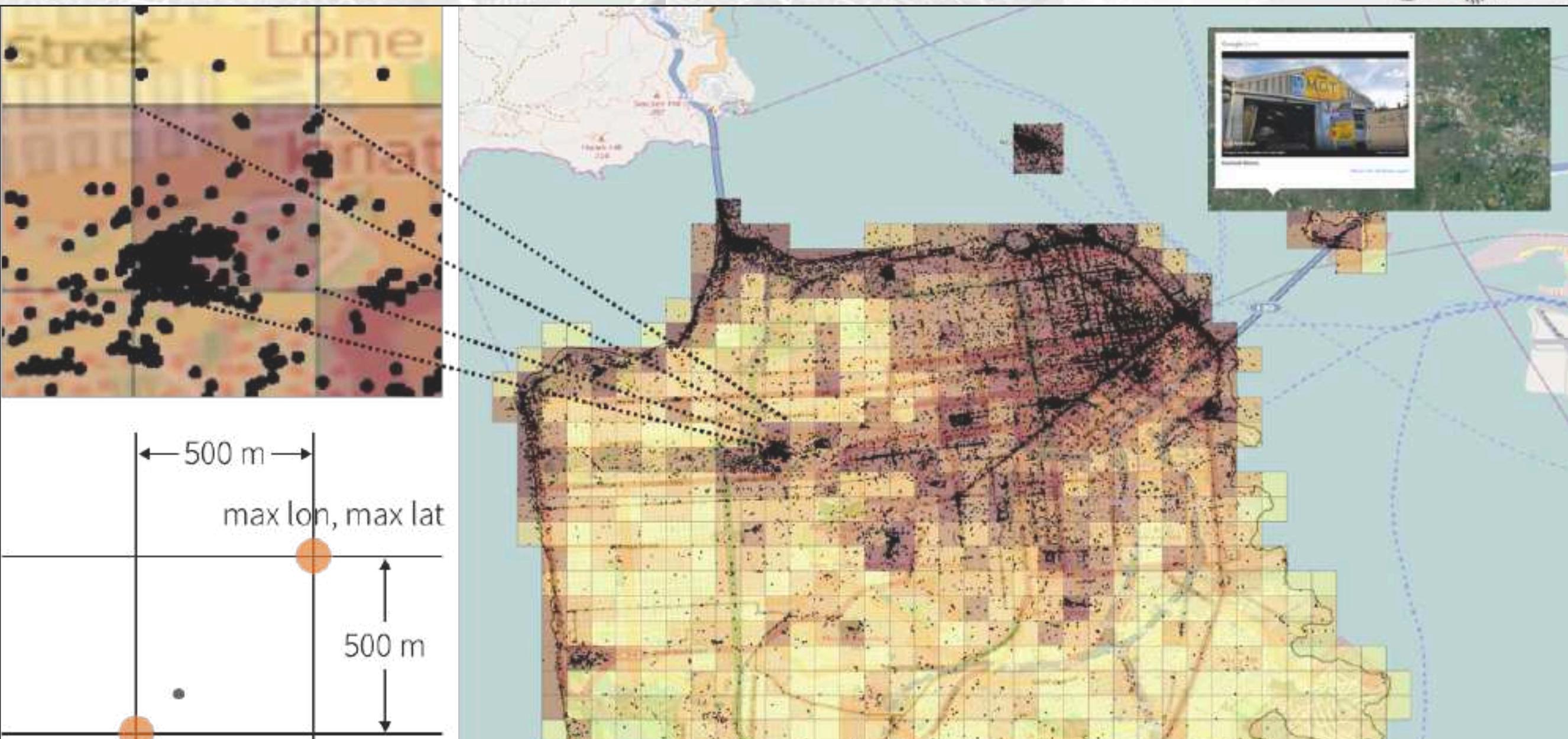
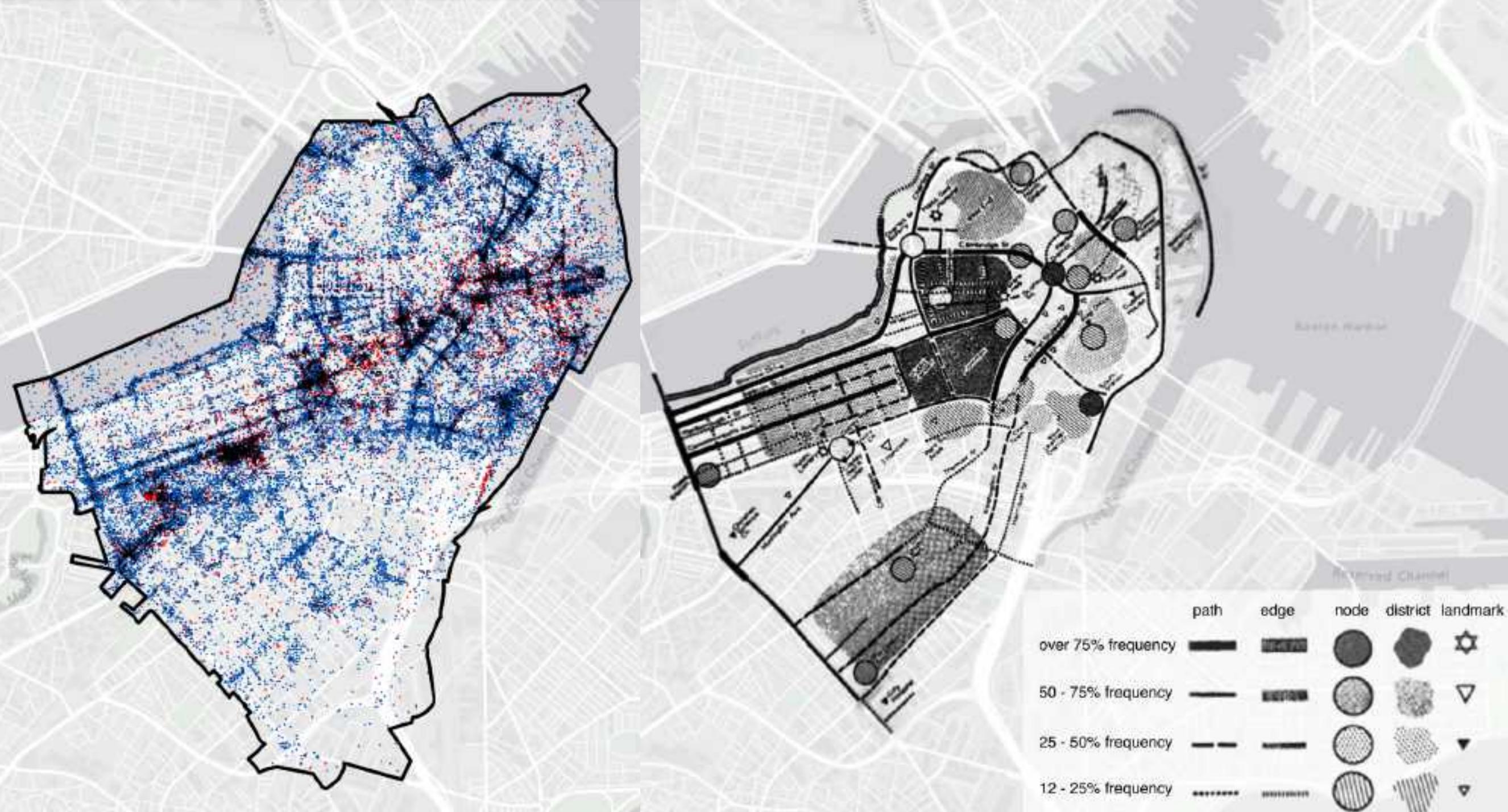
Google



C-IMAGE Project

City Cognitive Mapping through Geo-Tagged Images





- Liu, L., Zhou, B., Zhao, J., & Ryan, B. D. (2016). C-IMAGE: city cognitive mapping through geo-tagged photos. *GeoJournal*, 81(6), 817-861.

- Zhou, B., Liu, L., Oliva, A., & Torralba, A. (2014, September). Recognizing city identity via attribute analysis of geo-tagged images. In European conference on computer vision (pp. 519-534). Springer, Cham.



1 Sailing / Boating



2 Driving



6 Vocationing / Touring



17 Eating



19 Socializing



22 Competing



28 Farming



30 Shopping



32 Working



68 Running Water



40 Railroad



41 Trees



48 Asphalt



51 Carpet



57 Wood



62 Rock / Stone



65 Glass

1 sailing boating	2 driving	3 bilking	4 transporting things or	5 sunbathing	6 vacationing/touring	7 hiking	8 climbing	9 camping	10 reading	11 studying/learning	12 teaching	13 research	14 diving	15 swimming	16 bathing	17 eating
18 cleaning	19 socializing	20 congregating	21 waiting in line/queue	22 competing	23 sports	24 exercising	25 playing	26 gaming	27 spectating/being in an	28 farming	29 constructing/building	30 shopping	31 medical activity	32 working	33 using tools	34 digging
35 conducting business	36 praying	37 fencing	38 railing	39 wire	40 railroad	41 trees	42 grass	43 vegetation	44 shrubbery	45 foliage	46 leaves	47 flowers	48 asphalt	49 pavement	50 shingles	51 carpet
52 brick	53 tiles	54 concrete	55 metal	56 paper	57 wood (not part of a tree)	58 vinyl/linoleum	59 rubber/plastic	60 cloth	61 sand	62 rock/stone	63 dirt/soil	64 marble	65 glass	66 waves/surf	67 ocean	68 running water
69 still water	70 ice	71 snow	72 clouds	73 smoke	74 fire	75 natural light	76 direct sun/sunny	77 electric/indoor lighting	78 aged/worn	79 glossy	80 matte	81 sterile	82 moist/damp	83 dry	84 dirty	85 rusty
86 warm	87 cold	88 natural	89 man-made	90 open area	91 semi-enclosed area	92 enclosed area	93 far-away horizon	94 no horizon	95 rugged scene	96 mostly vertical components	97 mostly horizontal components	98 symmetrical	99 cluttered space	100 scary	101 soothing	102 stressful



Green Perception

Water Perception

Transportation Perception

High-rises Perception

Architecture Perception

Socializing Perception

Athletic Perception



Green Perception

Water Perception

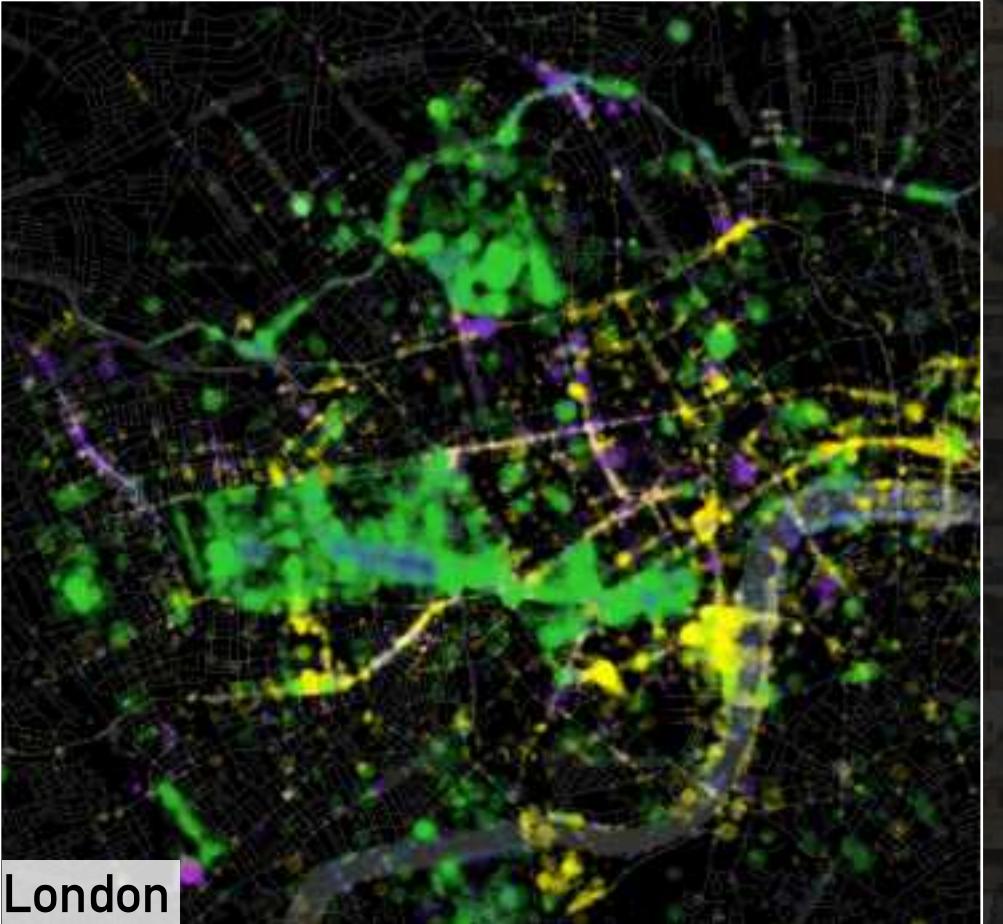
Transportation Perception

High-rises Perception

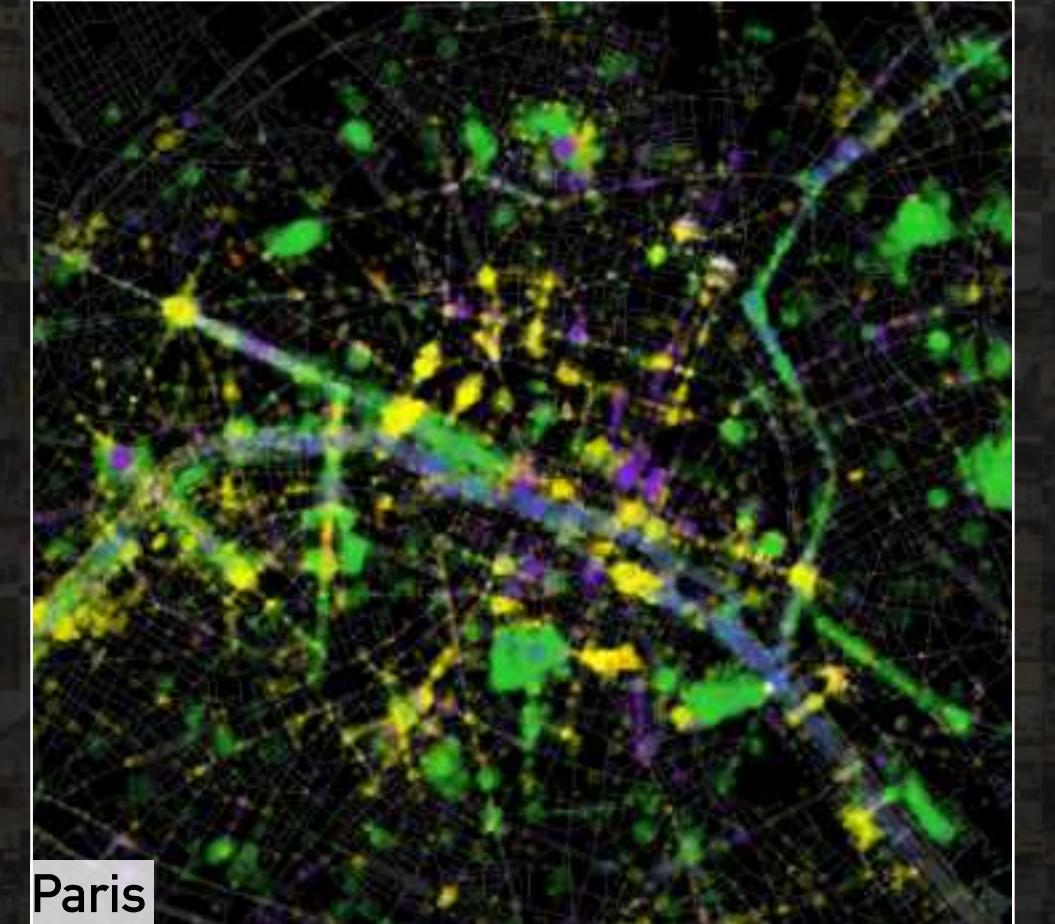
Architecture Perception

Socializing Perception

Athletic Perception



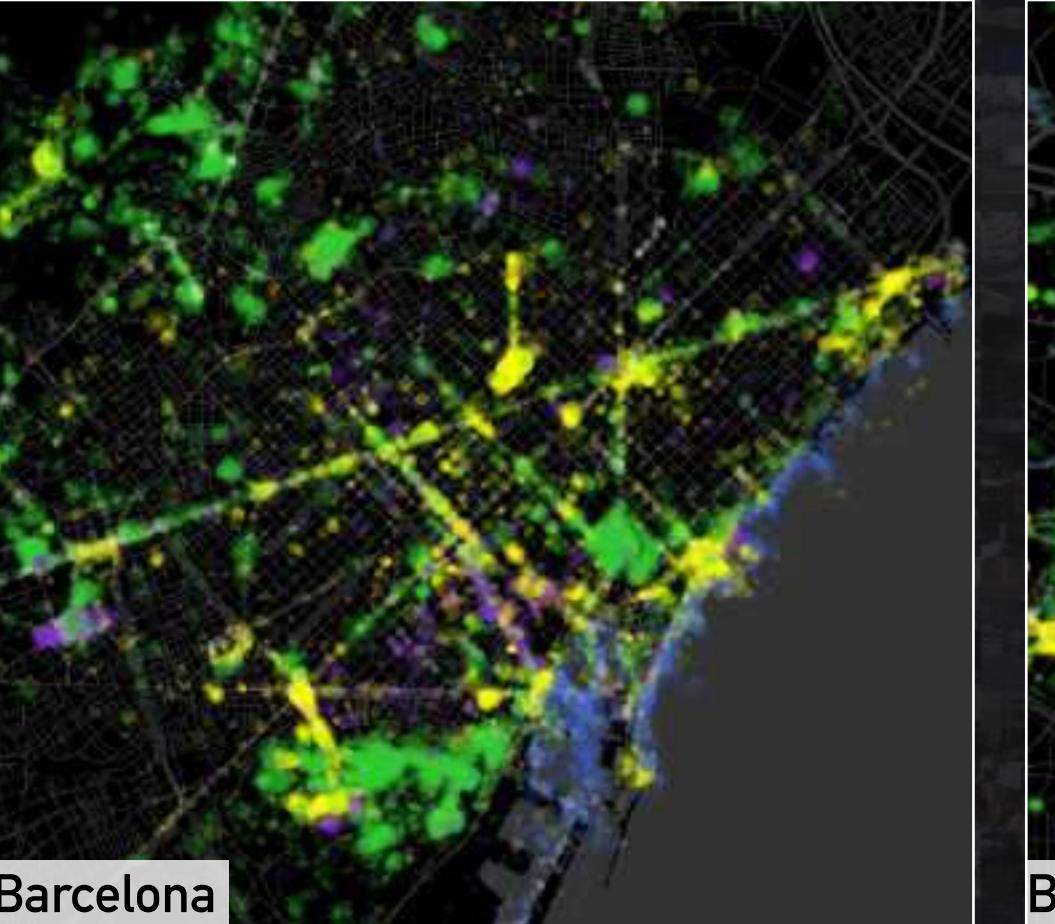
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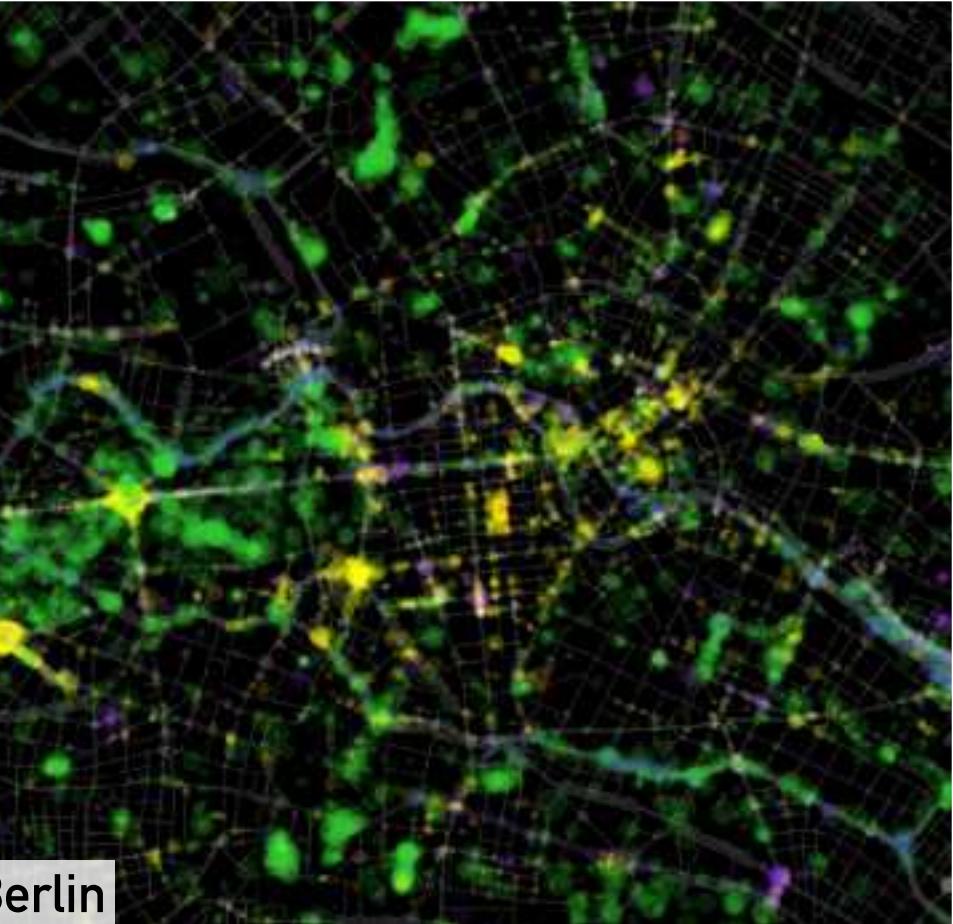
Paris



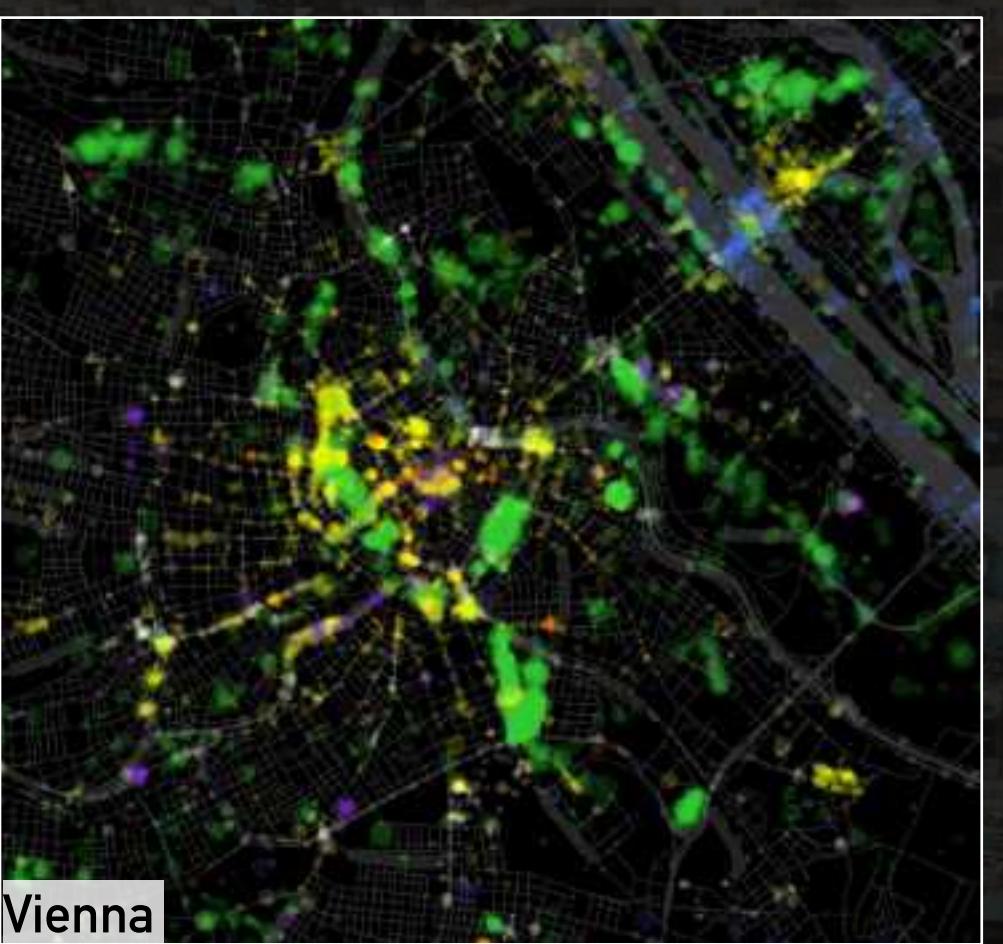
Amsterdam



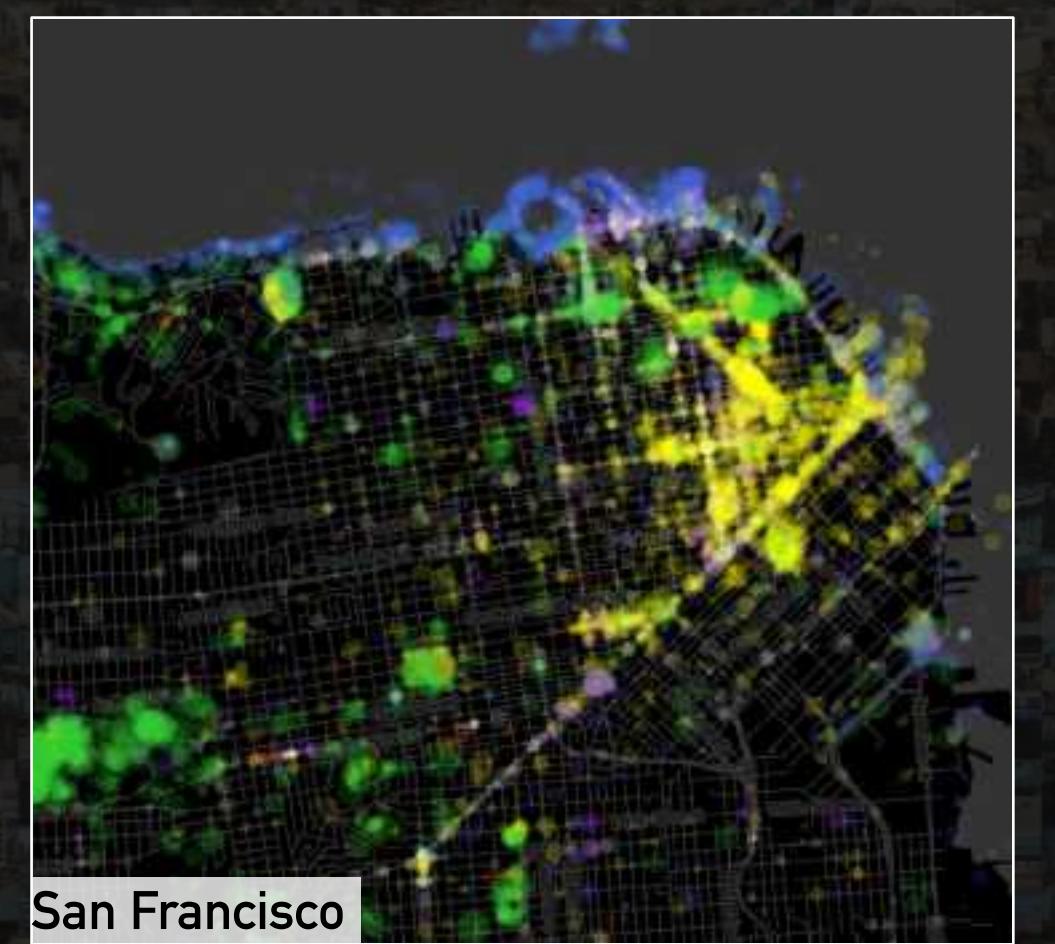
Barcelona



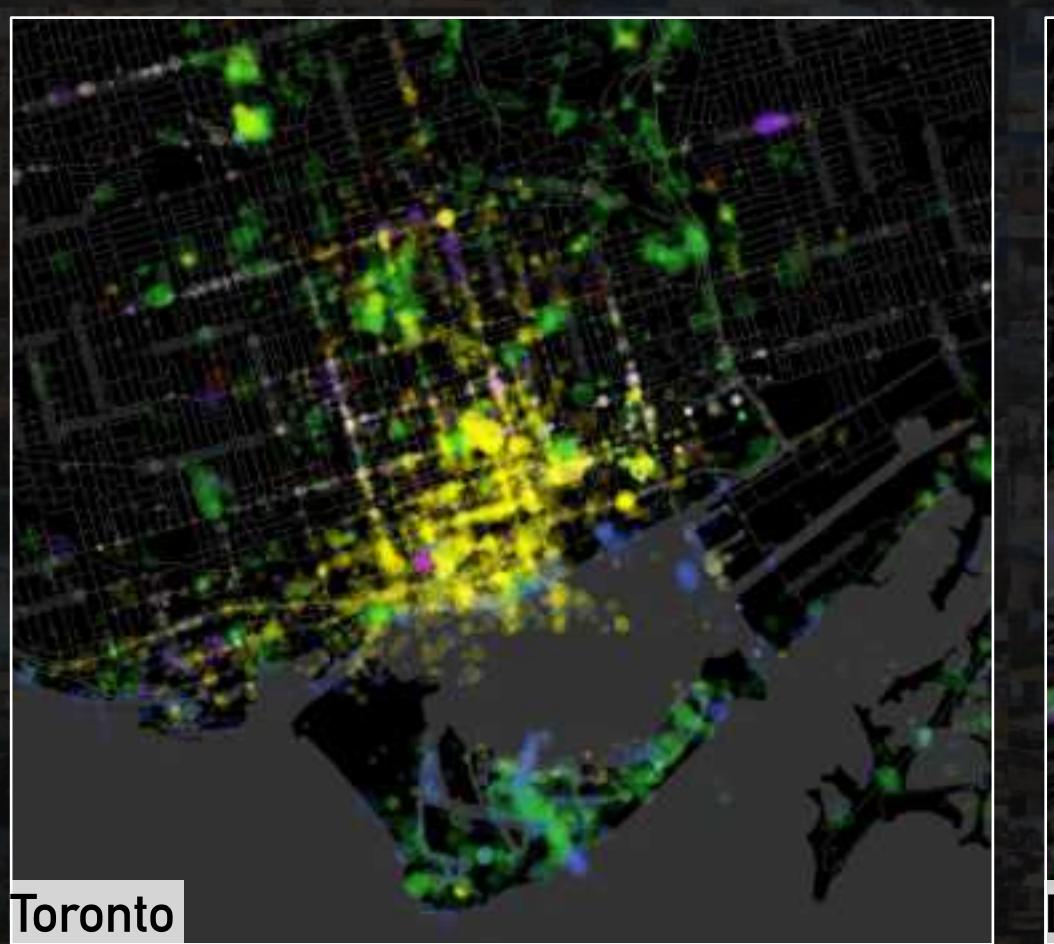
Berlin



Vienna



San Francisco



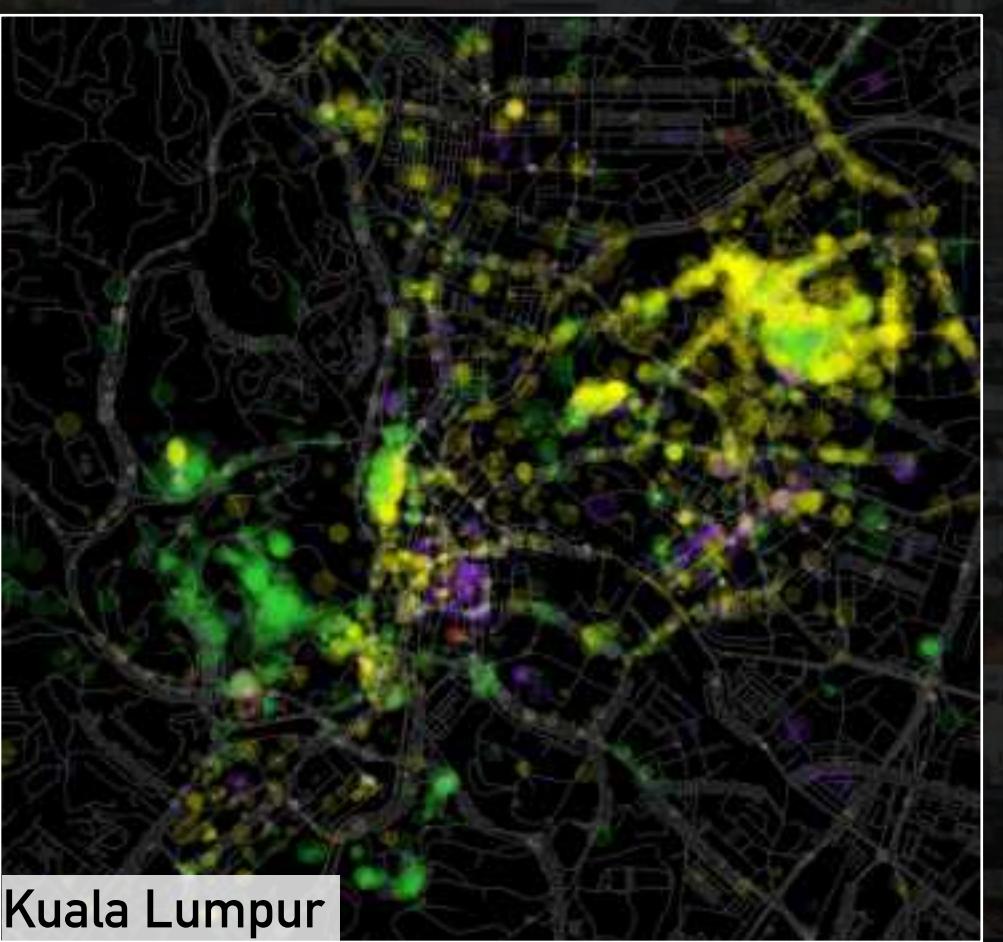
Toronto



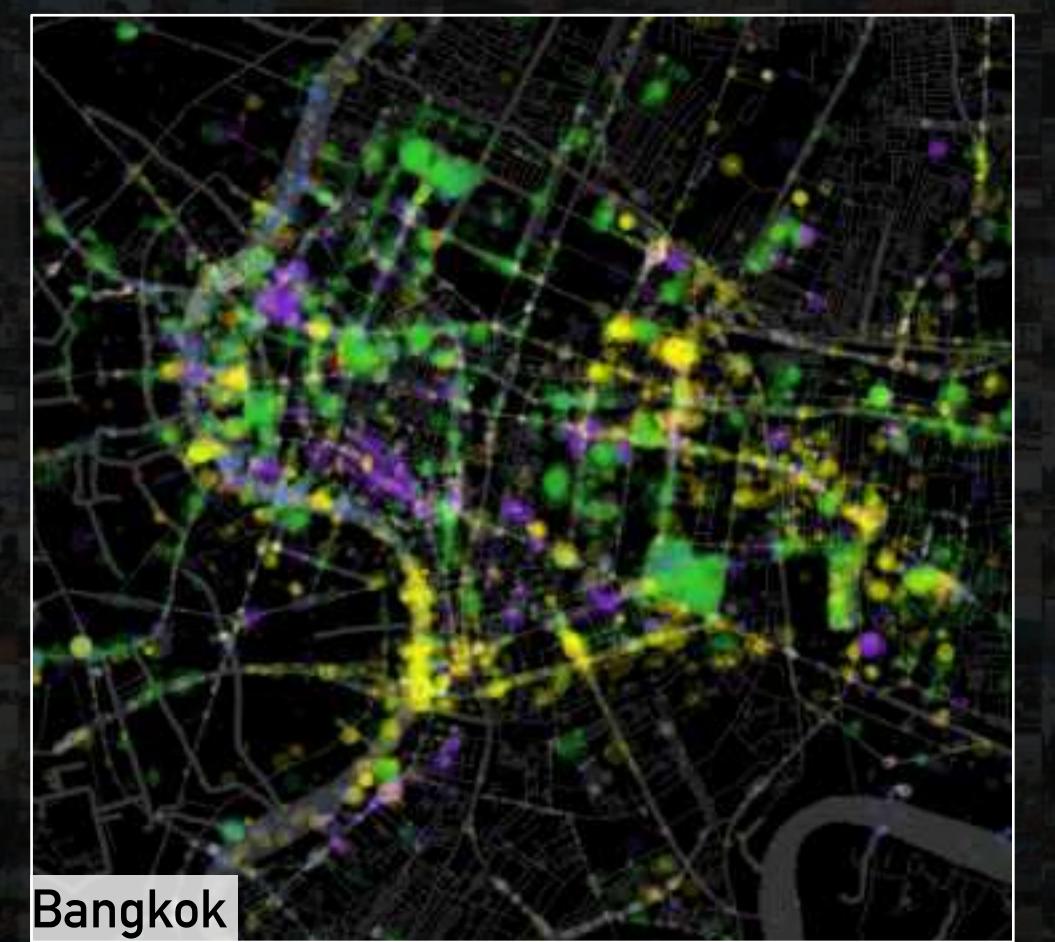
Boston



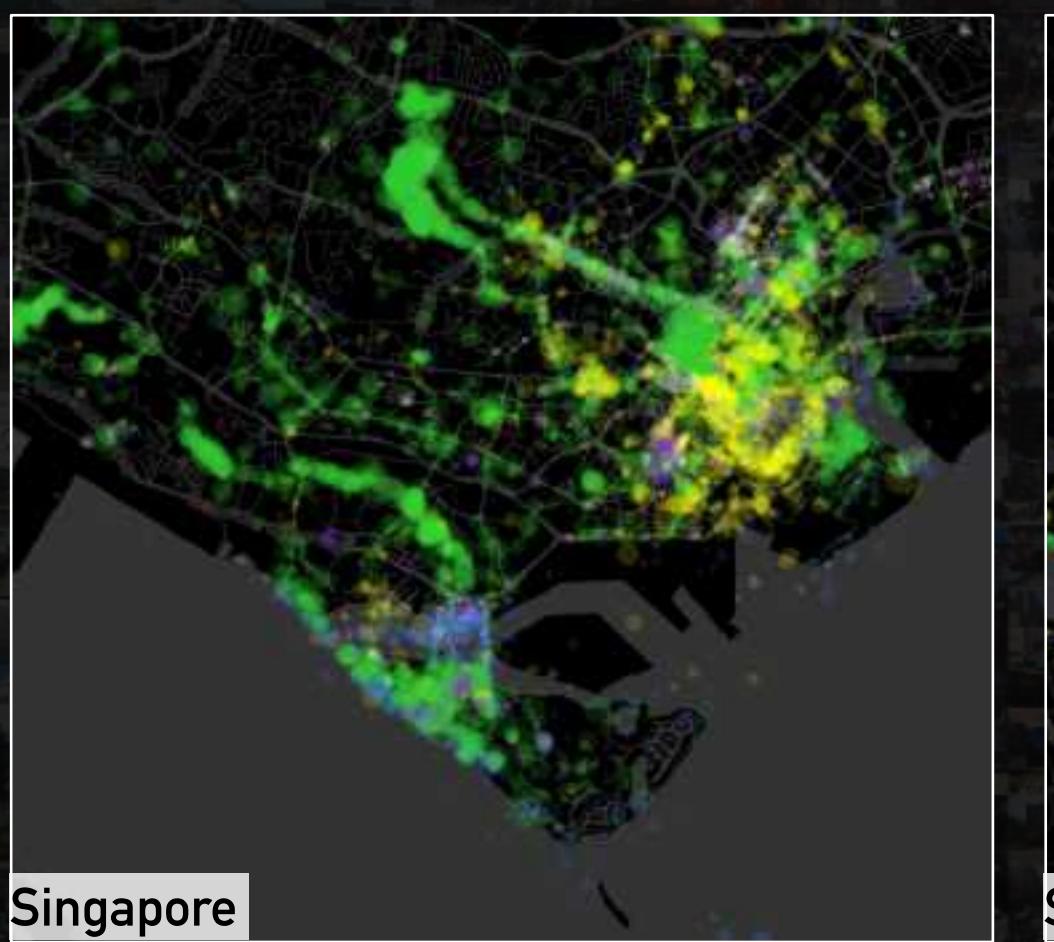
New York



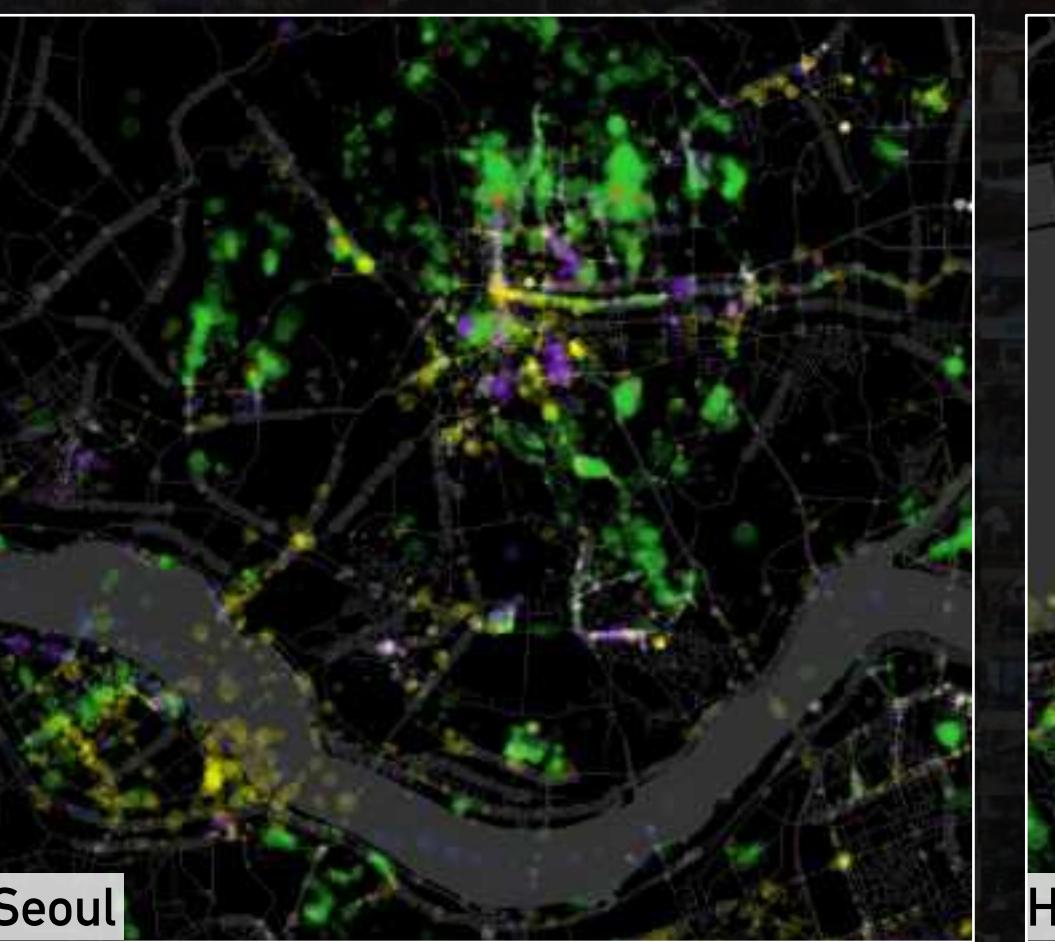
Kuala Lumpur



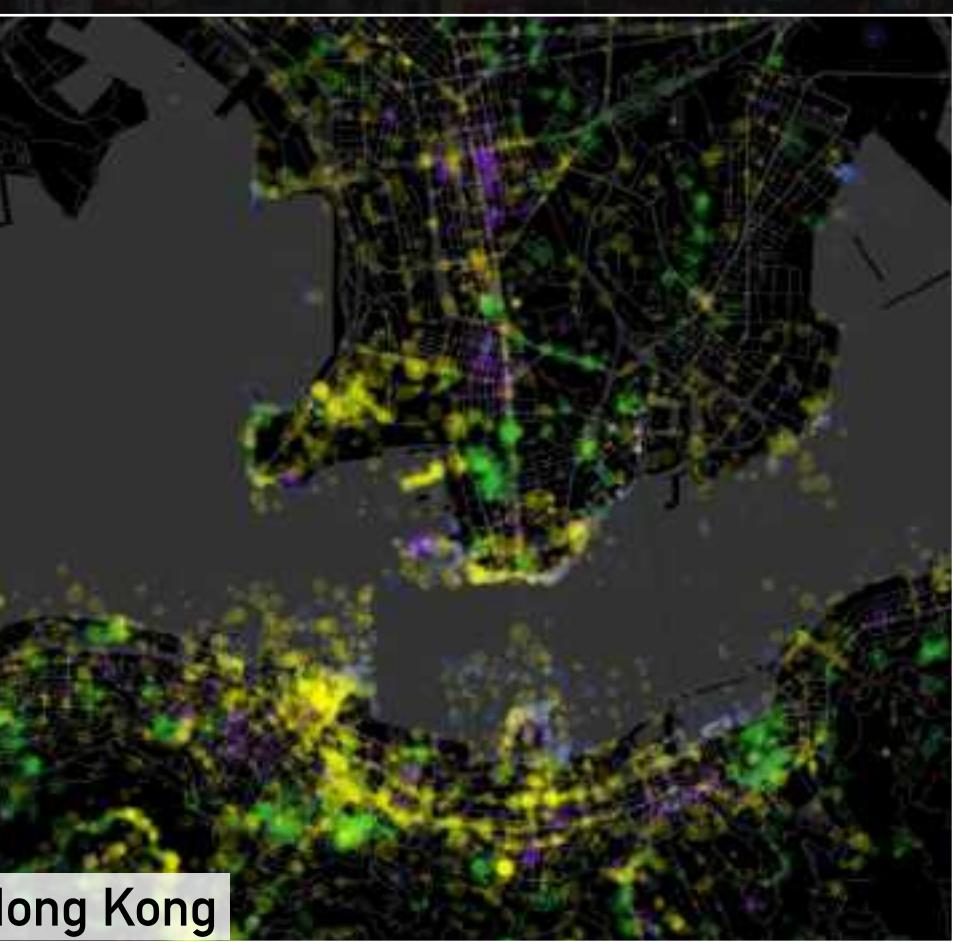
Bangkok



Singapore



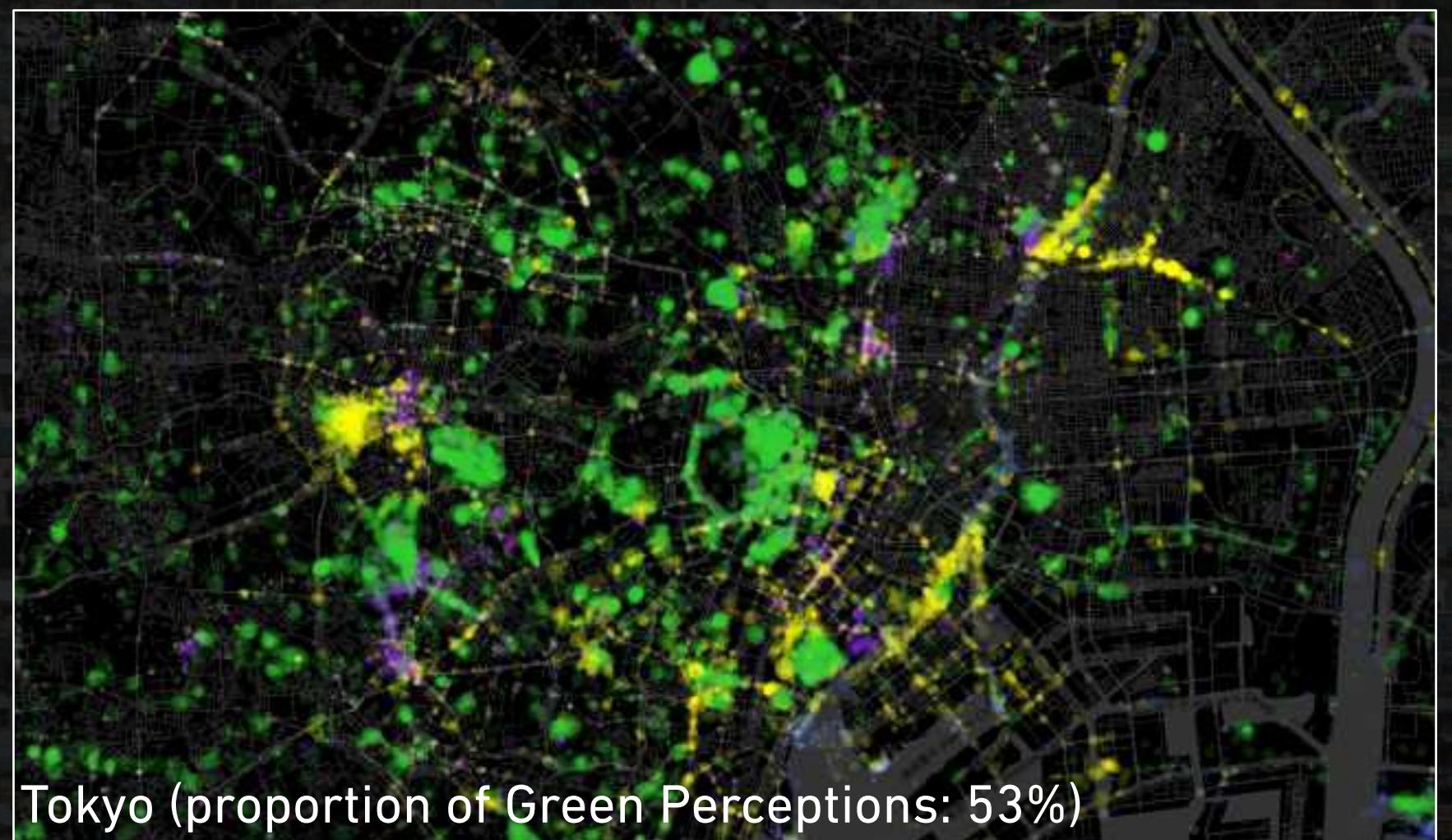
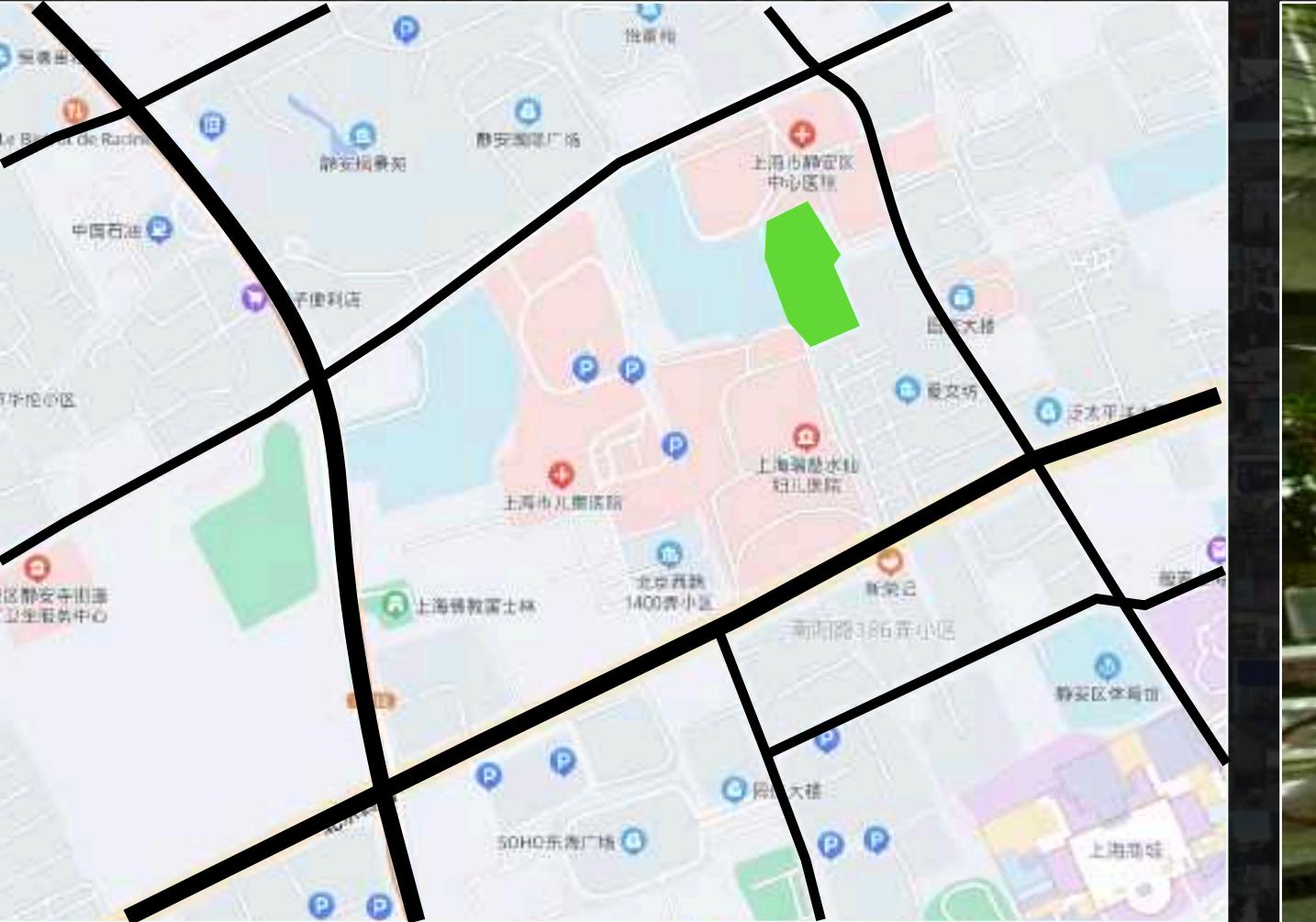
Seoul



Hong Kong

C-IMAGE Project

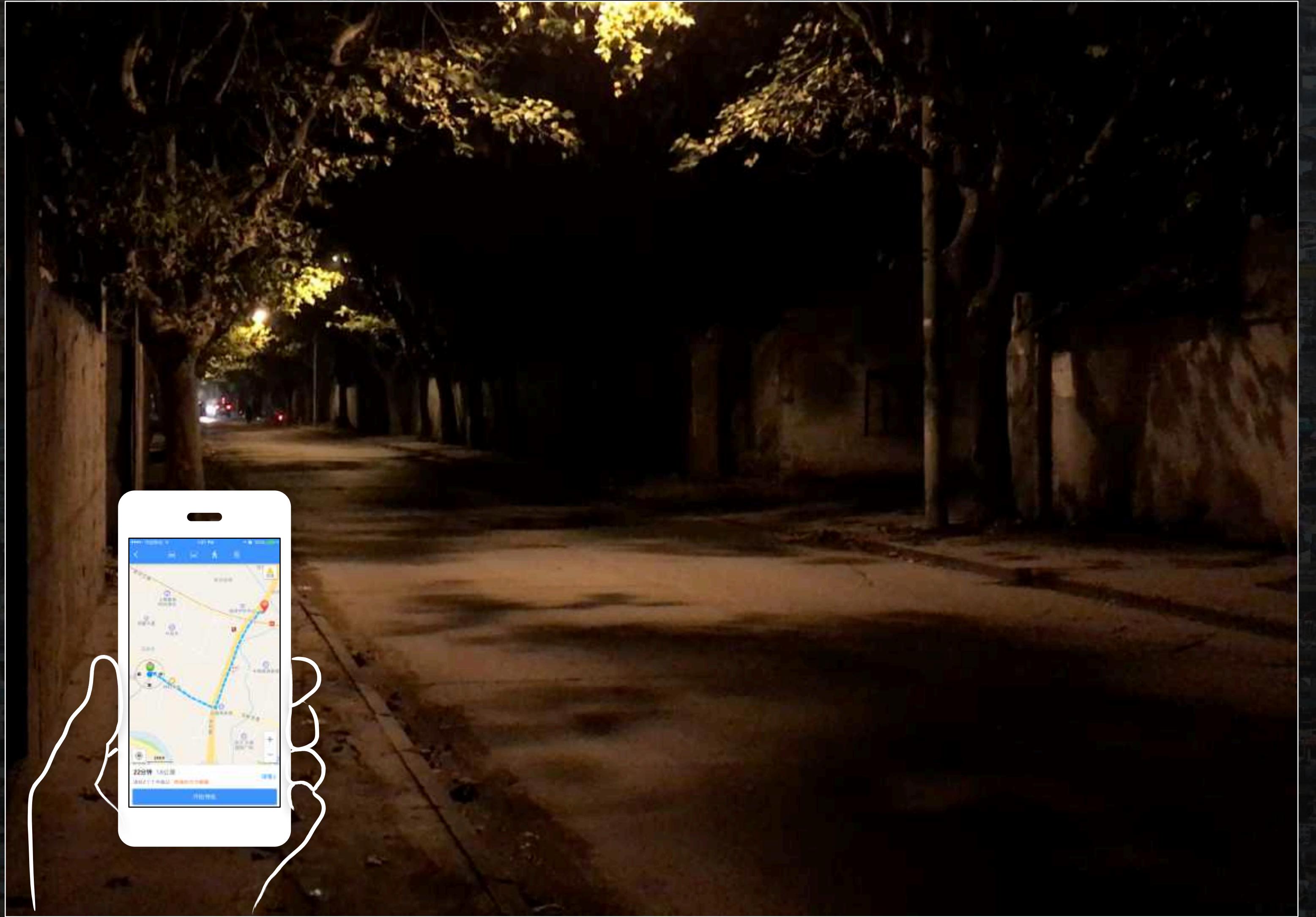
A reflection between "Real Space" and "Perceived Space"



- Liu, L., Zhou, B., Zhao, J., & Ryan, B. D. (2016). C-IMAGE: city cognitive mapping through geo-tagged photos. *GeoJournal*, 81(6), 817-861.
 - Zhou, B., Liu, L., Oliva, A., & Torralba, A. (2014, September). Recognizing city identity via attribute analysis of geo-tagged images. In *European conference on computer vision* (pp. 519-534). Springer, Cham.

StreetScore Project

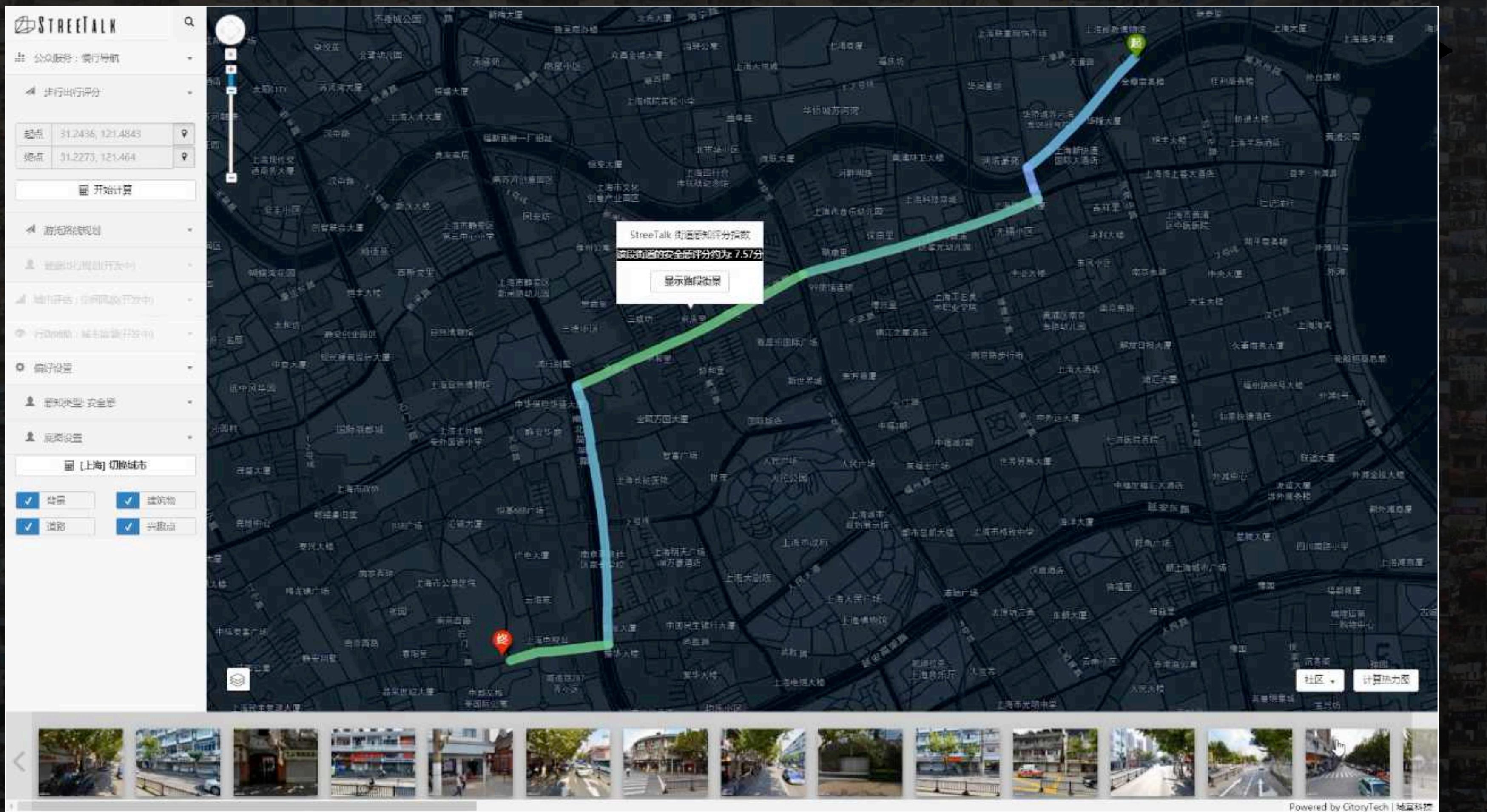
Evaluating street quality based on deep features and pairwise labeling method



- Zhang, F., Zhou, B., Liu, L., Liu, Y., Fung, H. H., Lin, H., & Ratti, C. (2018). Measuring human perceptions of a large-scale urban region using machine learning. *Landscape and Urban Planning*, 180, 148-160.
- Liu, Liu, Fan Zhang, Bolei Zhou, Zhoutong Wang, and Yingxin Li. "STREETALK: A NAVIGATION SYSTEM FOR PEDESTRIANS AND CYCLISTS." *Landscape Architecture Frontiers* 6, no. 2 (2018): 94-101.

StreetScore Project

Evaluating street quality based on deep features and pairwise labeling method



the pedestrian routing tool based on better score of safety scores

- Zhang, F., Zhou, B., Liu, L., Liu, Y., Fung, H. H., Lin, H., & Ratti, C. (2018). Measuring human perceptions of a large-scale urban region using machine learning. *Landscape and Urban Planning*, 180, 148-160.
- Liu, Liu, Fan Zhang, Bolei Zhou, Zhoutong Wang, and Yingxin Li. "STREETALK: A NAVIGATION SYSTEM FOR PEDESTRIANS AND CYCLISTS." *Landscape Architecture Frontiers* 6, no. 2 (2018): 94-101.

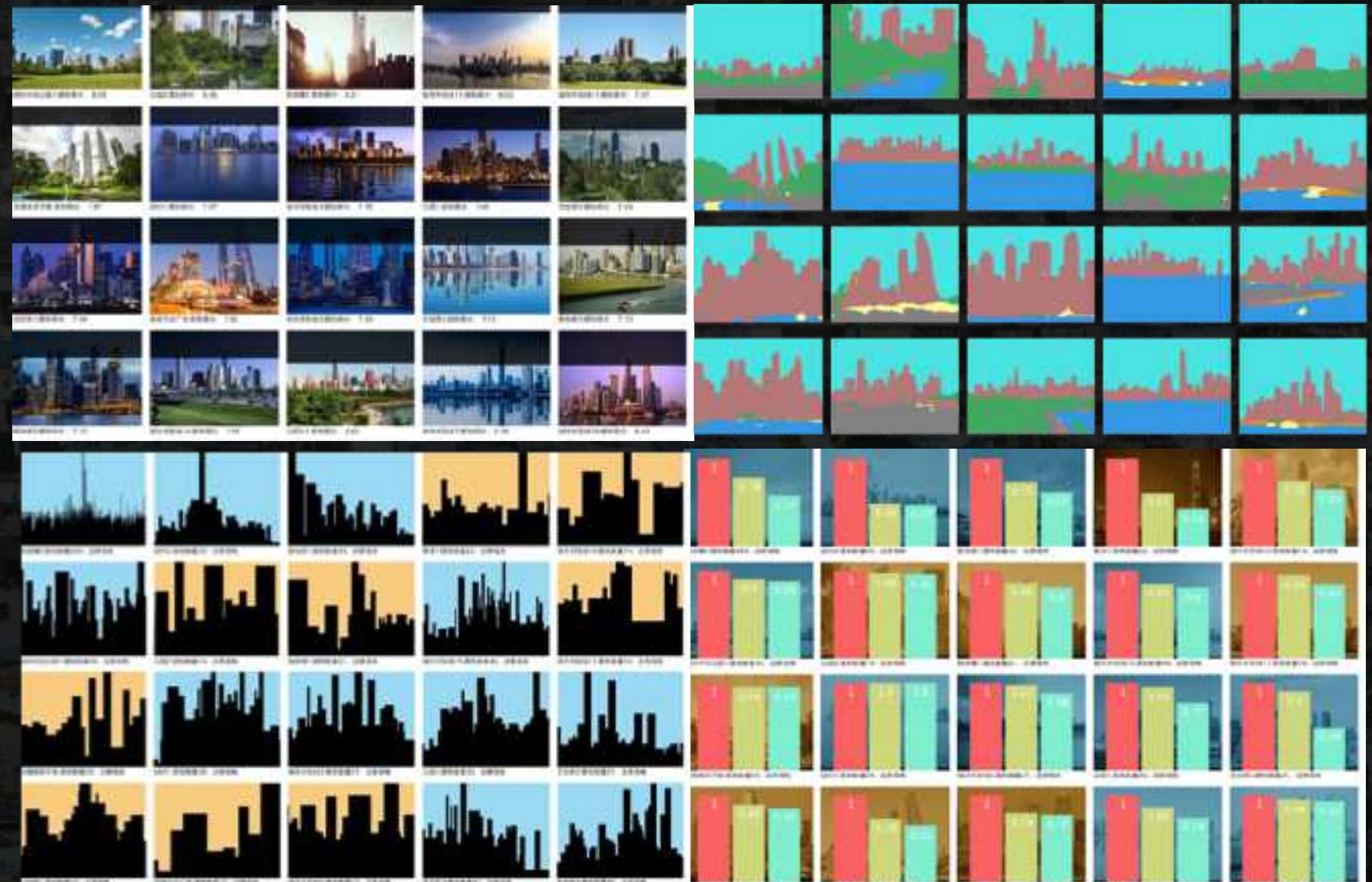
Pairwise Labeling Extensive

Visual comfort around subway stations in Beijing



Visual comfort evaluation in Nanjing

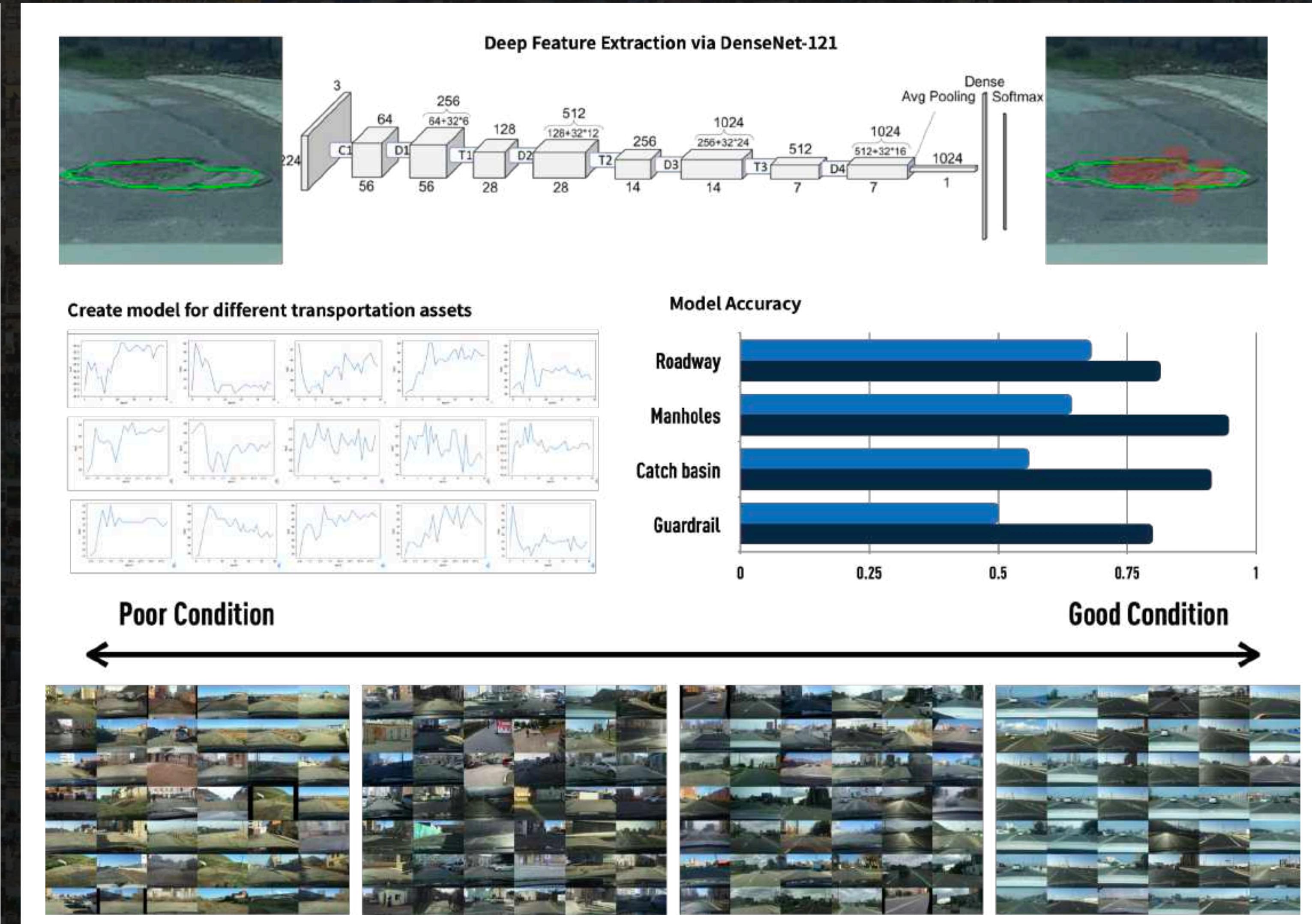
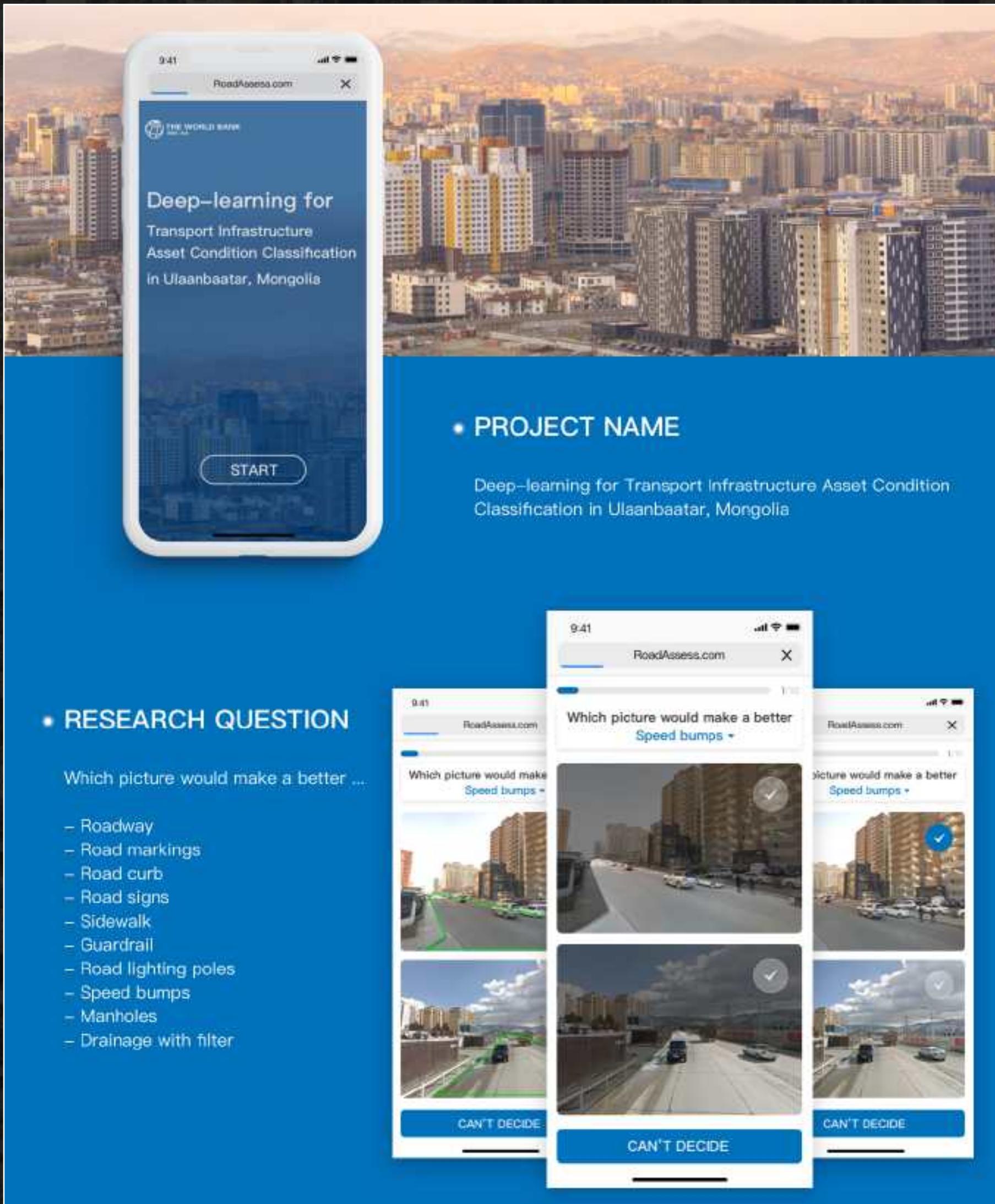
Skyline preferences survey in Shanghai



Aesthetic preference of store signs in Shanghai

Pairwise Labeling Extensive Example

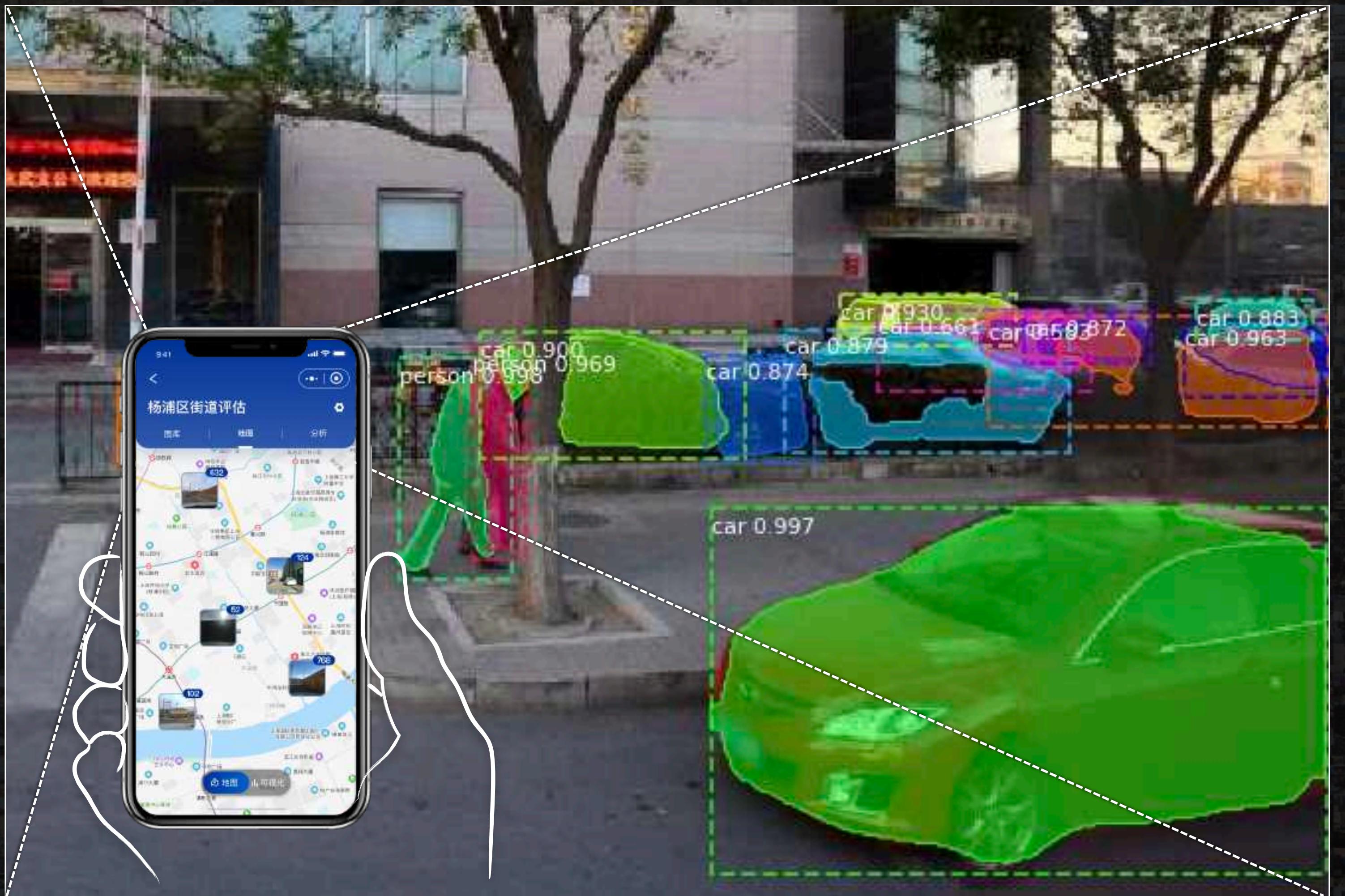
The road assets condition assessment based on UGC streetview images



Tools / Pipeline

CityEye project (WeChat Miniapp)

CityEye is a WeChat mini for grouping photos. One of the reasons why I would like to develop this tool, is just because it suffers for group photo management after organizing a field trip, when thousands of photos will be taken.



project list

photo calculation

statistics

member management

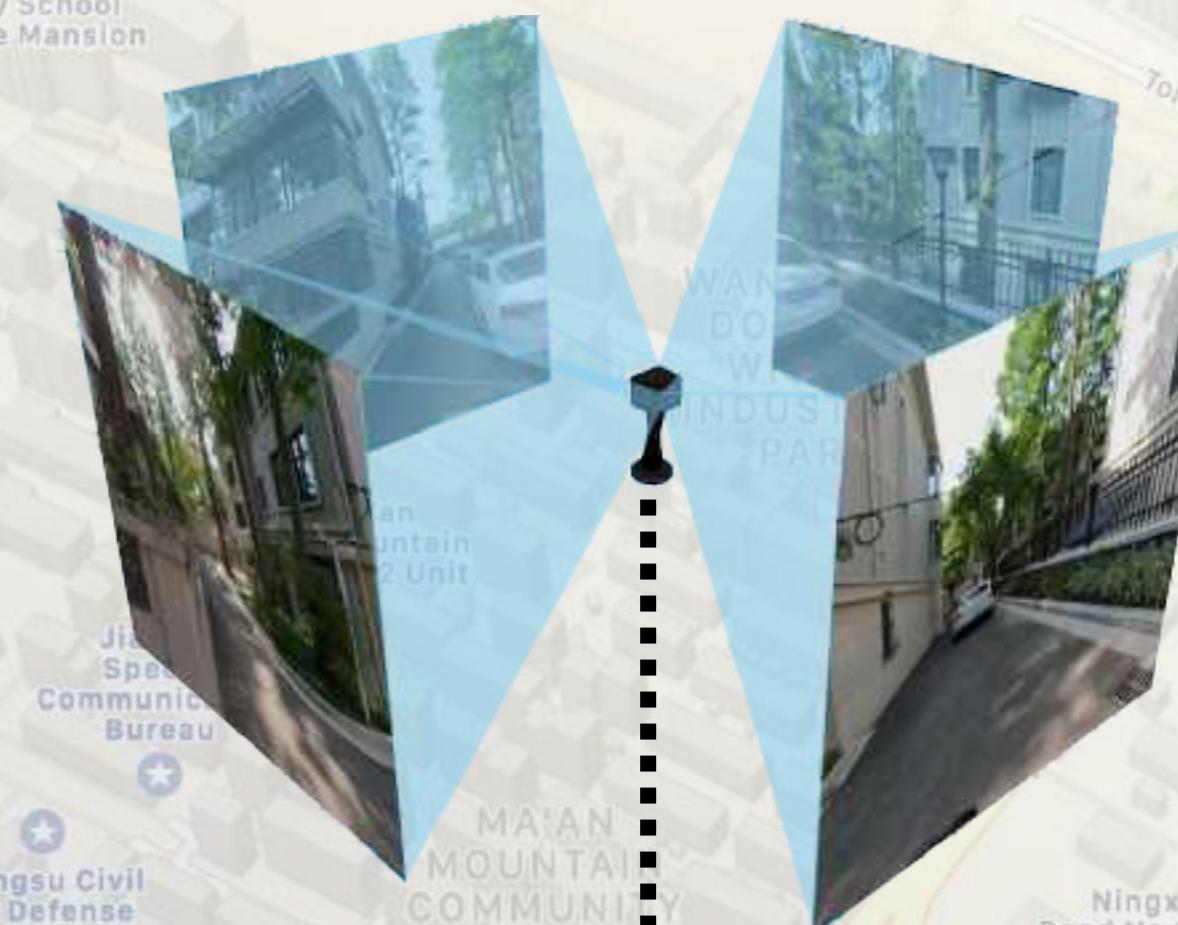
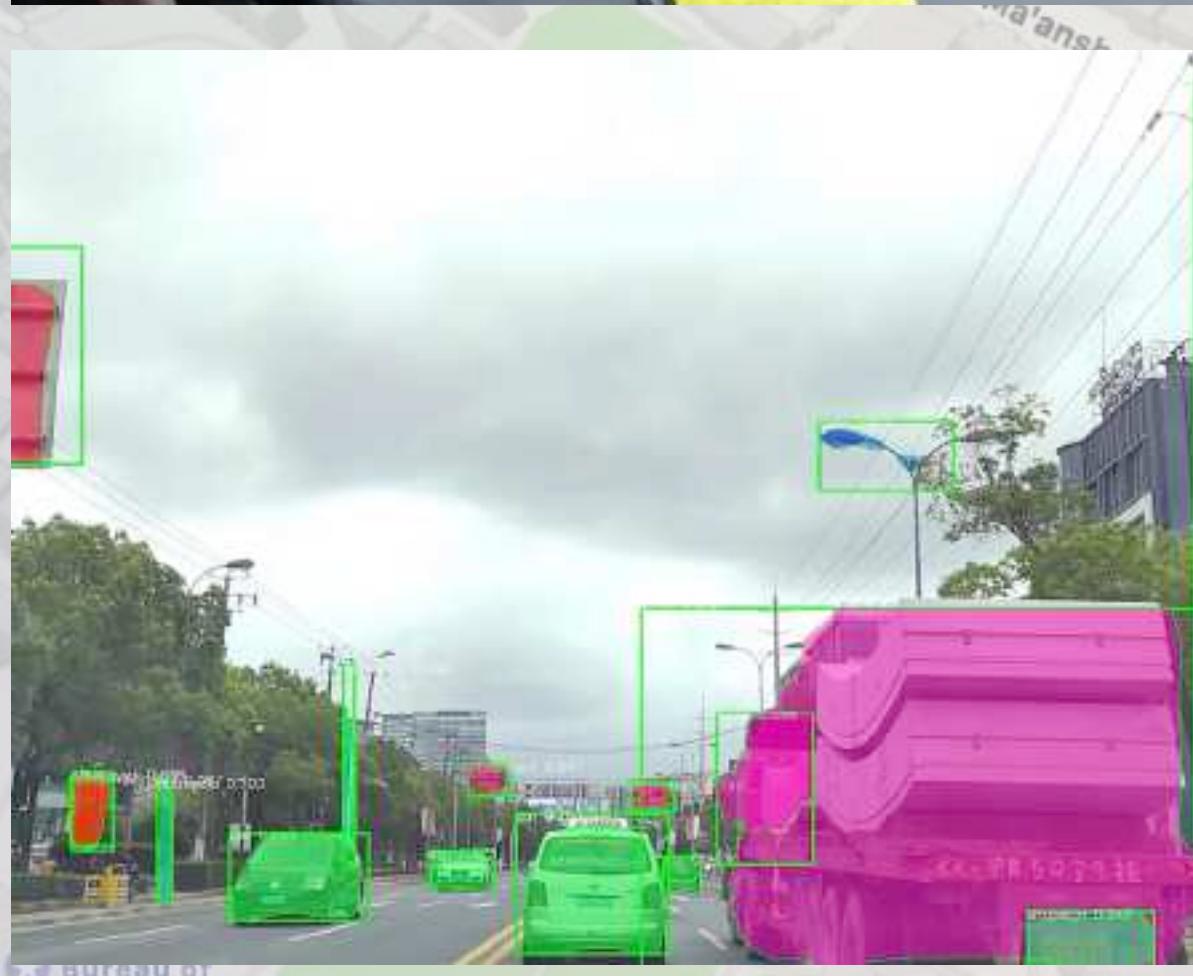
parsed data mapping



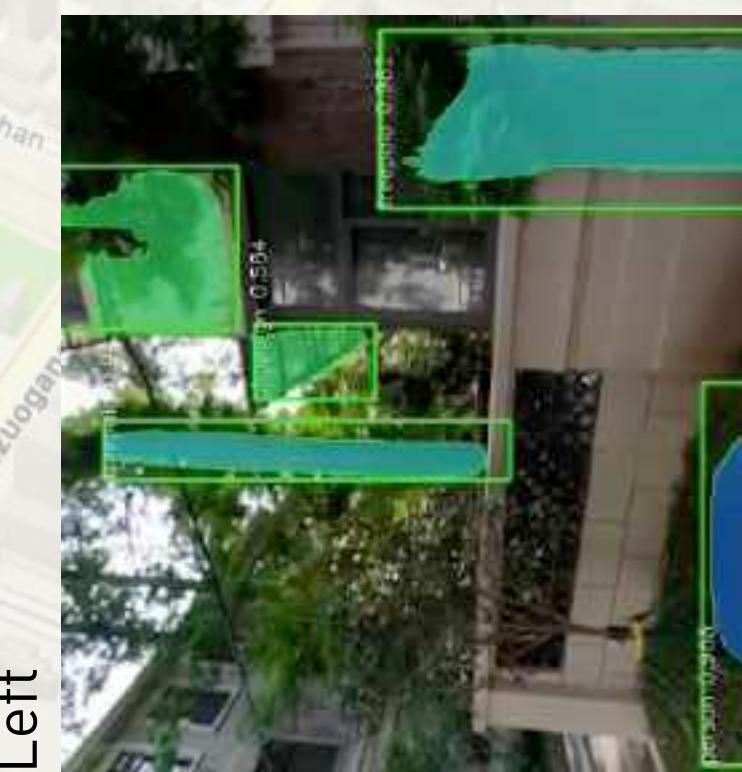
Tools / Pipeline

Other way of data collections

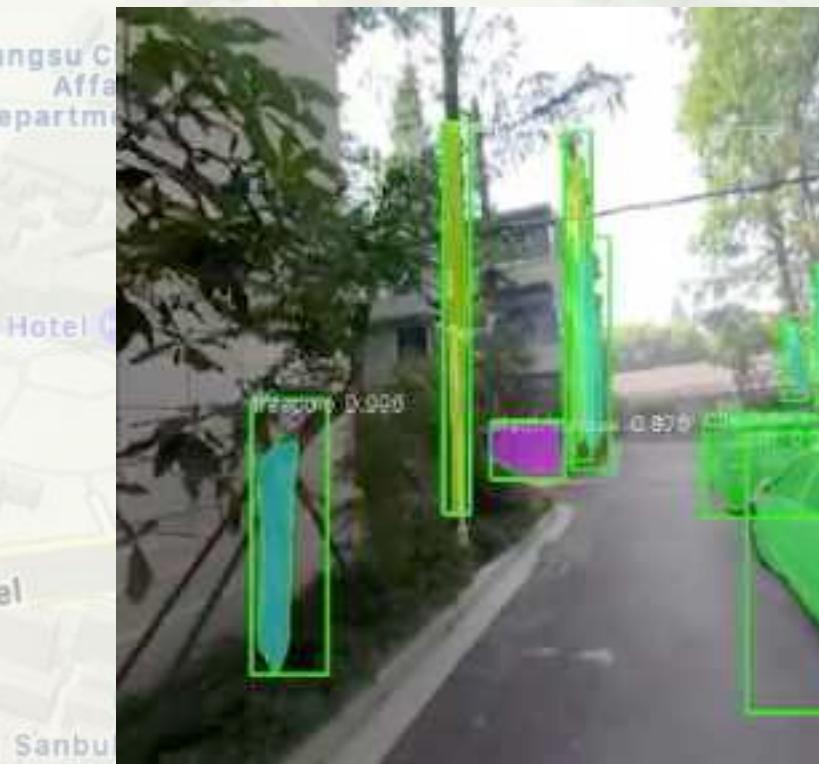
To get more first-hand dataset, we developed an independent solution in dealing with image data collection and processing. As to pedestrian vision, vehicle vision, and bicycle vision we deliver specific approaches of data collaboration and develop accordingly image processing APIs.



Left



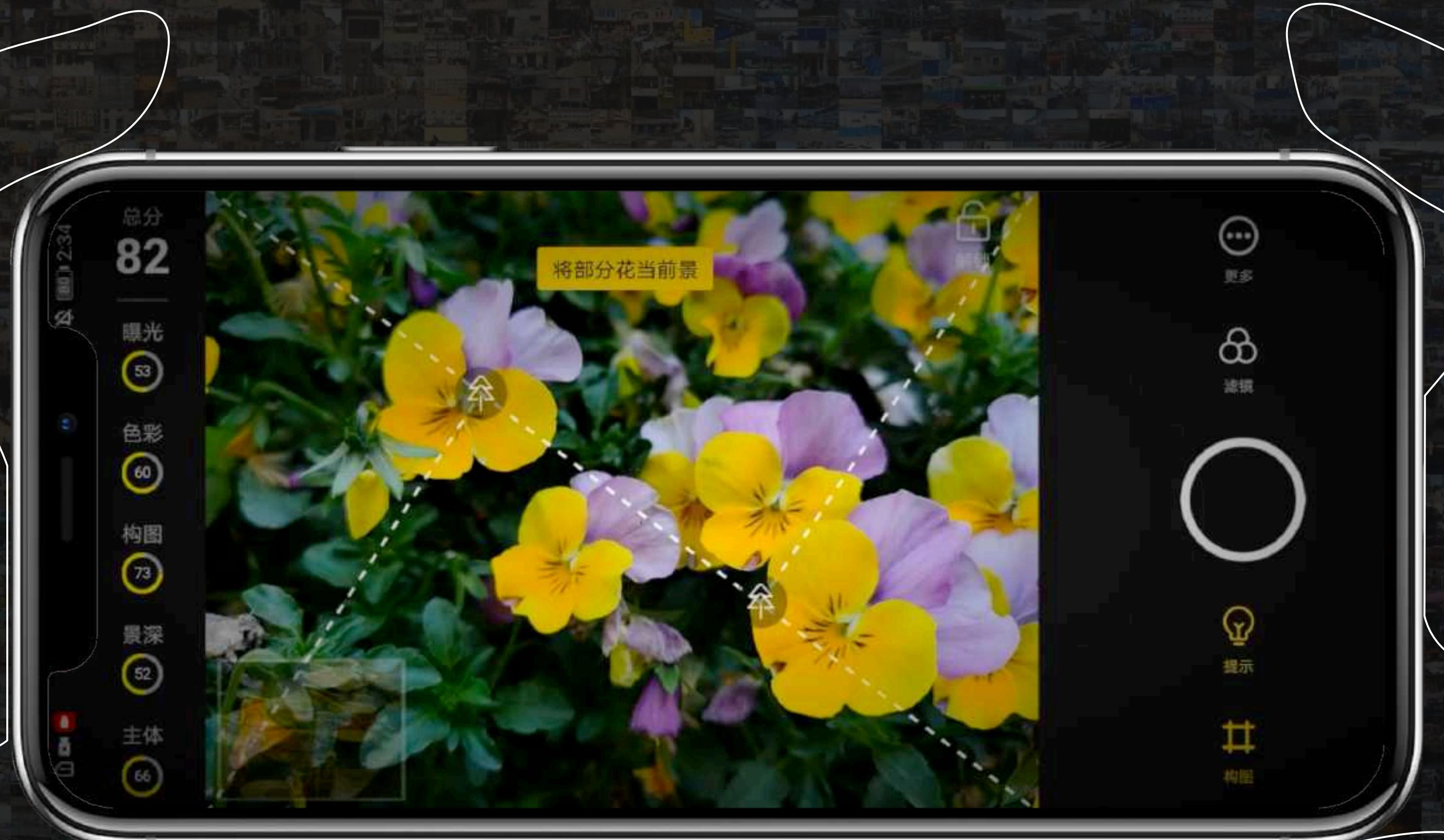
Front



Right

Tools / Pipeline

How to inspire individual curiosity of taking photos?



Tools / Pipeline

How to inspire individual curiosity of taking photos?

Overall Aesthetic score

总分
82

Exposure score

曝光
53

Color score

色彩
60

Composition score

构图
73

Depth of Field score

景深
52

Main Body score

主体
66



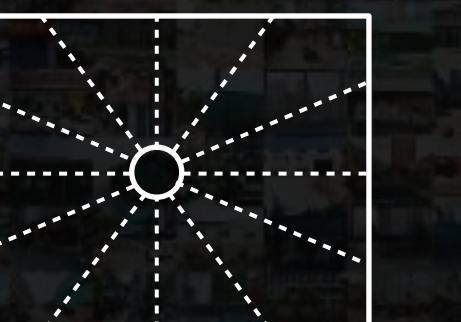
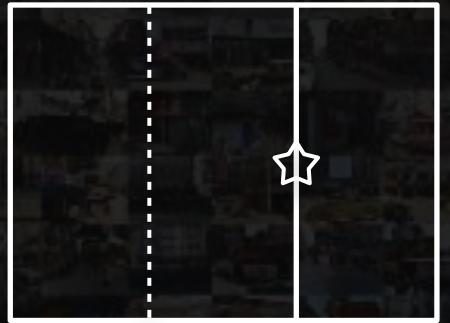
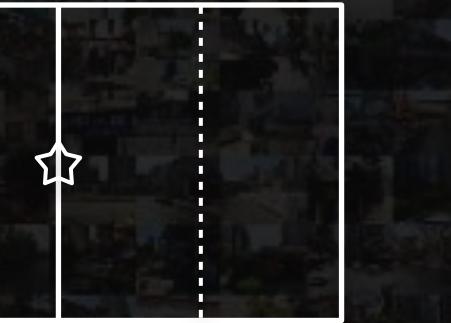
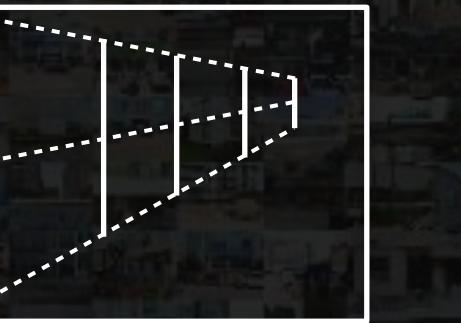
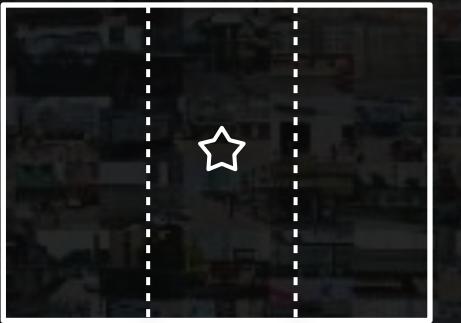
Photographic tips

Main Body Hint

Different Filters

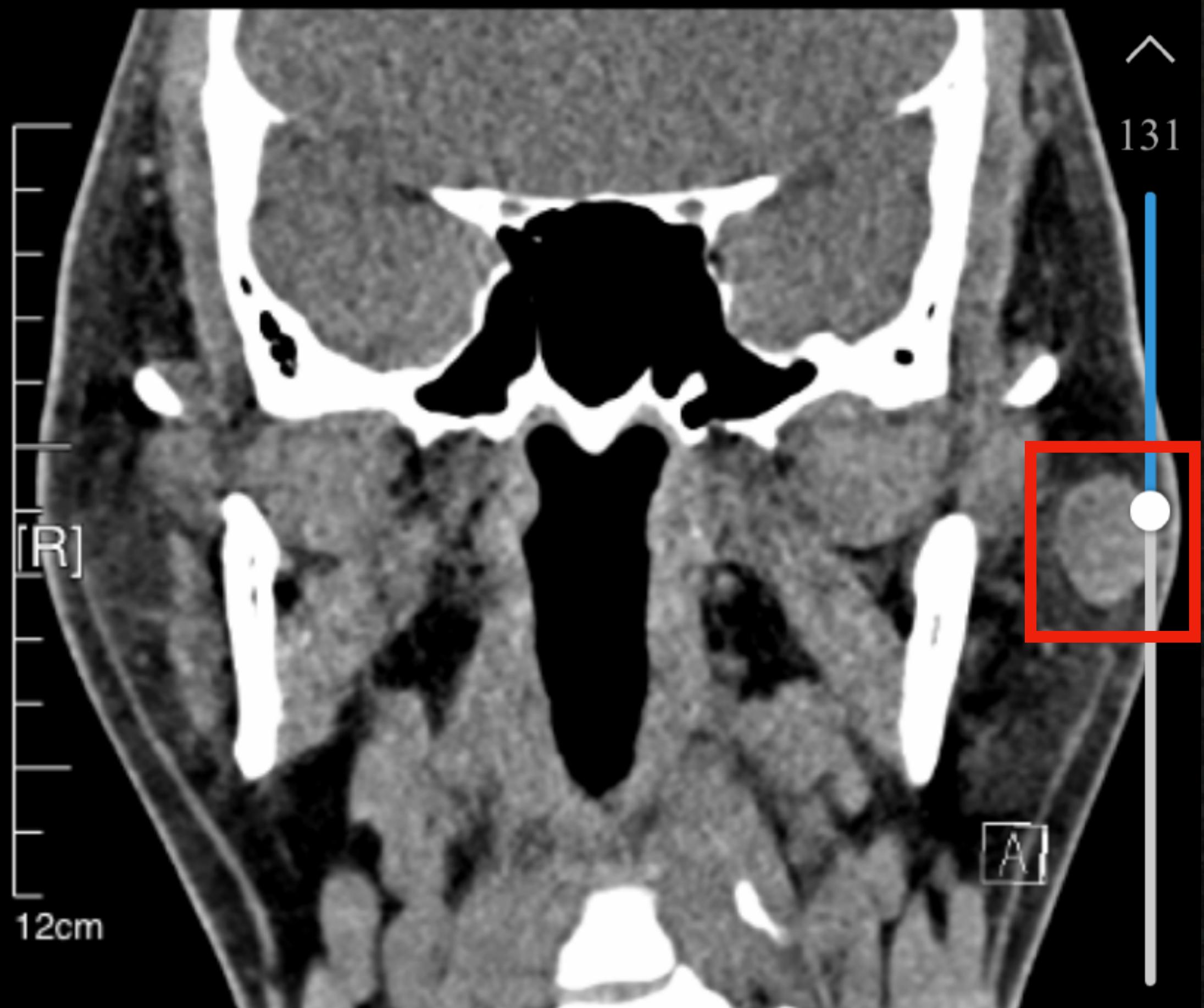
Composition Lines Hint

Reference Photo



01912060
LIU LIU
2

Head^05_Sinus (Adult)
07/03/2023
15:07:18.695000



Richness of Images



