

# Florence-MIT partnership senseable city **consortium**



*senseable* city lab:::

In progress 9-month report



Provincia  
di Firenze

## THE SENSEABLE CITY CONSORTIUM

- Different actors sit at the same table to invent the city of the future: Firenze, Amsterdam, Saragoza, Copenhagen, Scottish Islands
- Identifying common problems and inventing technology-based solutions to be prototyped and tested

## RESEARCH MERIT OF THE PARTERSHIP WITH FLORENCE

- Municipal Wi-Fi as opportunity for local development.  
How? → Charter of Florence
- Innovation in research and advanced services on tourism.  
How? → Flickr analysis



senseable city lab:...

## Spotting the Tourist

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The wavelets flung it [here](#), this [sea-gliding](#) creature, this [strange creature](#) like a [weed](#). - Hilda Dolittle

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Using Explicitly Disclosed Location Information in Flickr for Urban and Mobility Analysis.  
A Proof of Concept

Fabien Girardin principal investigator  
Filippo Dal Fiore project coordination  
Carlo Ratti project direction

**MAIN research question**

What can we know of excursionists?

**SUB research question**

How do tourists move inside the Province?

## HYPOTHESES

- depending on the tourists' nationality and the period of the year, preferred destinations and routes are likely to change
- the number of excursionists is likely to change over the course of the year and some nationalities are likely to be overrepresented

# data available so far

Gruppo	Denominazione	Totale alberghi		Totale extra		Totale		Alloggi Privati	
		Arrivi	Presenze	Arrivi	Presenze	Arrivi	Presenze	Arrivi	Presenze
000	Totale Generale	889187	2055064	217307	1156871	1106494	3211935	8223	40246
Gruppo	Denominazione	Totale alberghi		Totale extra		Totale		Alloggi Privati	
		Arrivi	Presenze	Arrivi	Presenze	Arrivi	Presenze	Arrivi	Presenze
001	FRANCIA	39727	105812	14744	77452	54471	183264	703	2953
003	CLANDA	10953	31478	26036	166948	36989	198426	225	1120
004	GERMANIA	29567	78599	20997	135380	50564	213979	238	1107
006	GRAN BRETAGNA	51168	144470	19266	107057	70434	251527	405	2493
007	IRLANDA	5274	15793	4334	34302	9608	50095	33	104
008	DANIMARCA	4555	13515	5071	36407	9626	49922	41	139
009	GRECIA	8377	21434	434	2017	8811	23451	22	113
010	POR TOGALLO	4972	12807	396	1981	5368	14788	16	804
011	SPAGNA	60105	139848	5005	18874	65110	158722	224	1956
017	BELGIO	5512	29554	5434	39573	14946	69127	128	579
018	LUSSEMBURGO	368	1064	149	907	517	1971	9	50
024	ISLANDA	236	801	66	270	302	1071	2	4
028	NORVEGIA	4960	12344	1030	4487	5990	16831	42	139
030	SVEZIA	6087	16454	1754	8368	7841	24822	68	232

● Hotel presences

MUSEI E GALLERIE	ANNO 2005	ANNO 2006	DIFF. ASSOL.	DIFF%
Palazzo Vecchio	421,328	415,329	-5,999	-1.4
di cui				
Quartieri monumentali	359,907	349,189	-10,718	-3.0
Emozioni da Museo-Museo dei Ragazzi	61,421	66,140	+4,719	+7.7
Cappella Brancacci	116,878	107,808	-8,870	-7.6
di cui				
Cappella Brancacci	82,460	77,329	-5,121	-6.2
Emozioni da Museo-Museo dei Ragazzi	34,228	30,479	-3,749	-10.9
Santa Maria Novella	48,798	48,455	-341	-0.7
Santo Spirito	3,748	1,856	-1,892	-50.5
Firenze Com'era	7,210	7,077	-133	-1.8
di cui				
Firenze Com'era	6,370	5,856	-514	-8.1
Emozioni da Museo-Museo dei Ragazzi	840	1,221	+381	+45.4
Collezioni del '900	8,242	1,489	-6,753	-81.9
<b>TOTALI</b>	<b>604.002</b>	<b>580.014</b>	<b>-23.988</b>	<b>-4.0</b>

● Museum presences



● Anecdotal evidence

**all the rest remain invisible!**

... but nowadays tourists leave **digital traces** behind them







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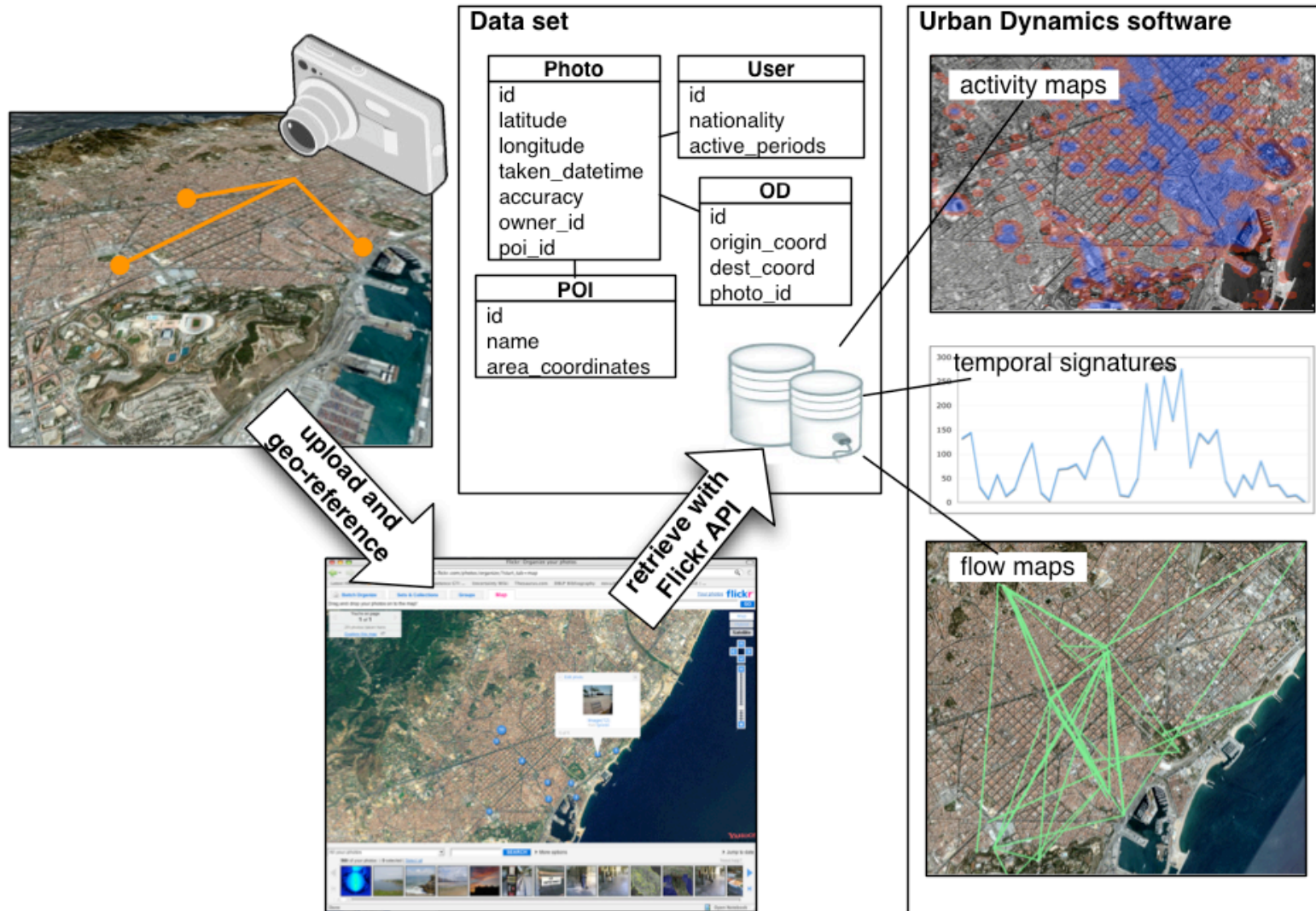


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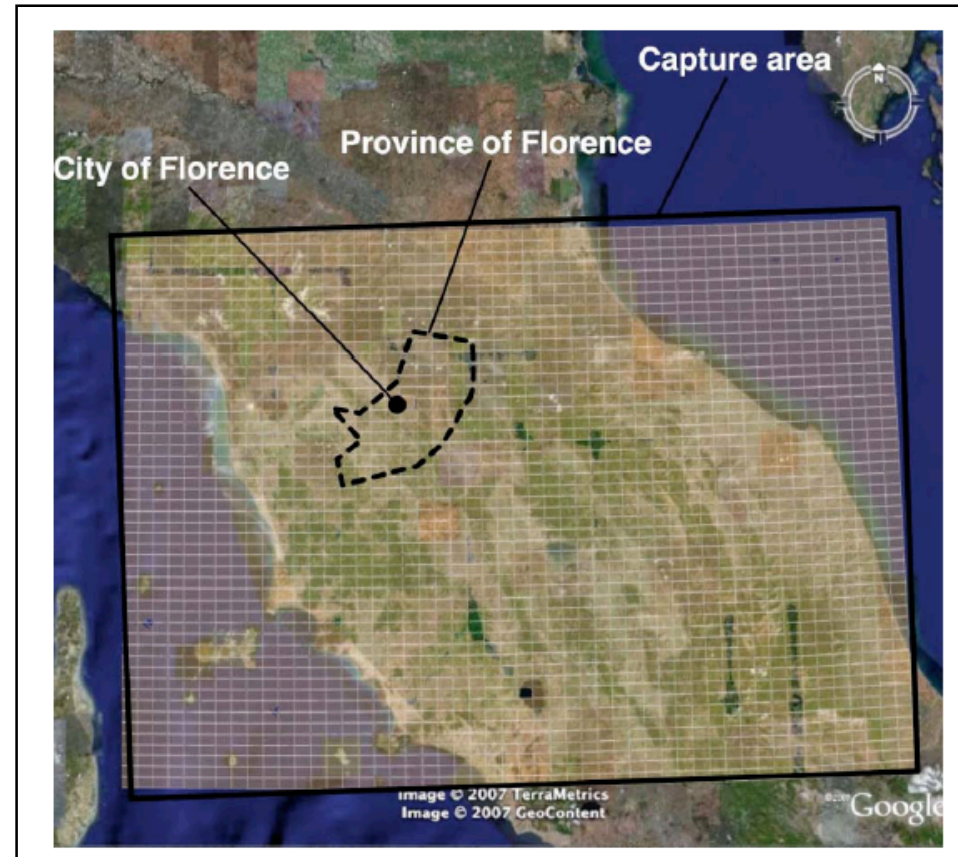
# TECHNICAL PROCESS



## OUR SAMPLE FROM FLICKR

- period of 2 years (2006-2007)

- Province: 81.017 photos  
City: 43.428 photos



- Province: 4280 photographers (3994 visitors)  
City: 2755 photographers (2630 visitors)

## **TYPES OF RESULTS**

<b>City</b>	<b>Photos</b>	<b>Total users</b>	<b>Visitors 1</b>
London	349.132	11578	9410
New York	334.079	10930	9181
Paris	277.926	10048	8909
San Francisco	350.284	8978	7241
Rome	144.501	6019	5510
Chicago	249.509	6590	5435
Berlin	156.927	6032	5398
Los Angeles	206.162	6363	5271
Barcelona	154.106	5818	5225
Amsterdam	123.527	5505	5015
Boston	178.680	5154	4289
Tokyo	210.432	4909	4264
<b>Province of Florence</b>	<b>81.017</b>	<b>4280</b>	<b>3994</b>
Prague	101.210	3899	3722
Sydney	152.526	4201	3561
Vanconver	158.539	4062	3337
Hong Kong	95.194	3095	2755
<b>City of Florence</b>	<b>43.428</b>	<b>2755</b>	<b>2638</b>
Beijing	113.306	2682	2472
Toronto	103.446	2427	1857

	2005	2006	2007 <sup>7</sup>
average of photos taken per day	39.72	127.6	129.3
average number of photographer per day	2.29	5.41	7.62

- not disclosed
- Italy
- USA
- UK
- Germany
- Spain
- Canada
- Netherlands
- France
- Switzerland
- Australia
- Belgium
- Brazil

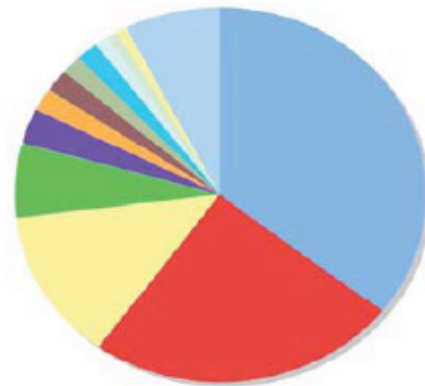
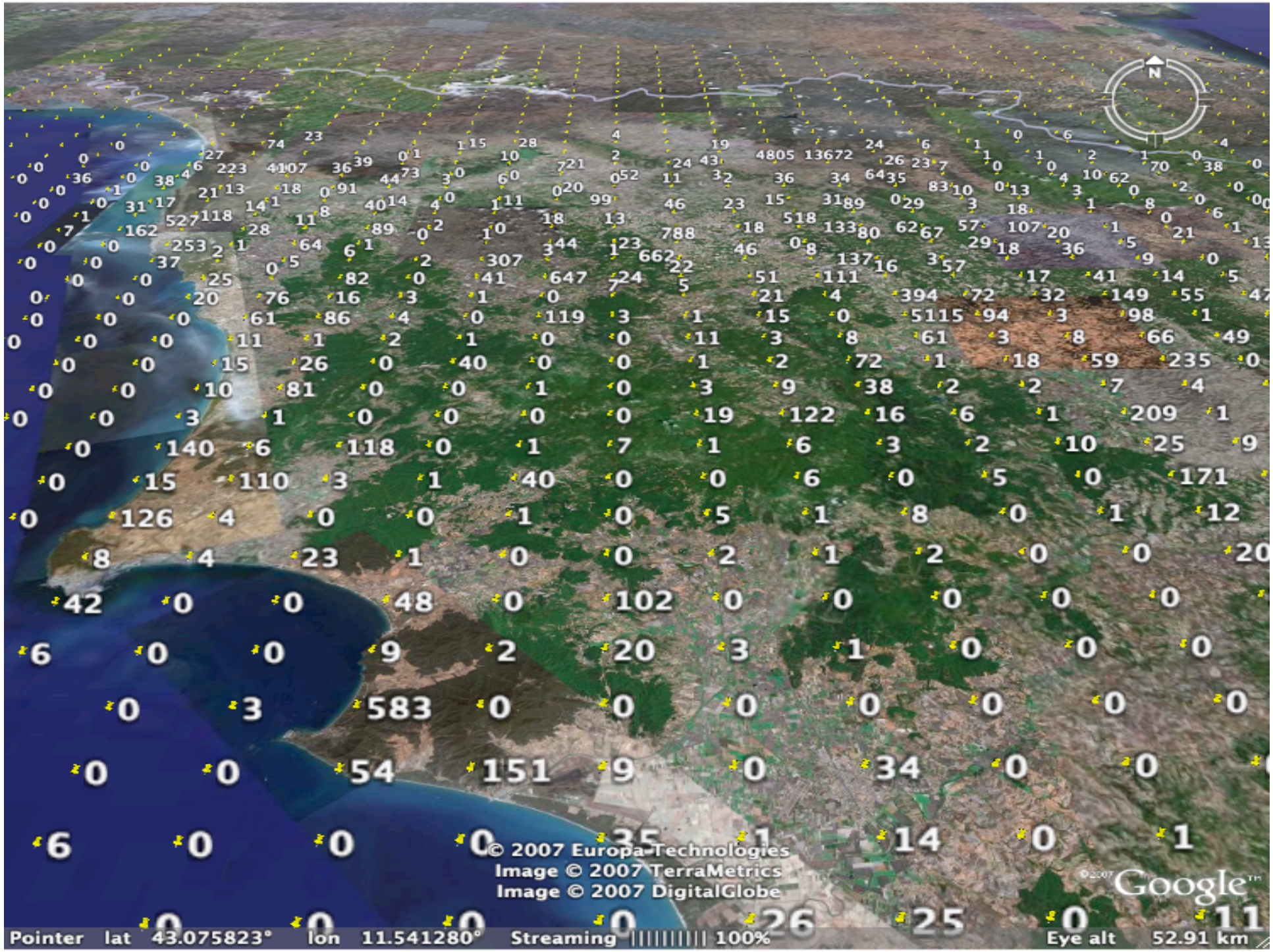


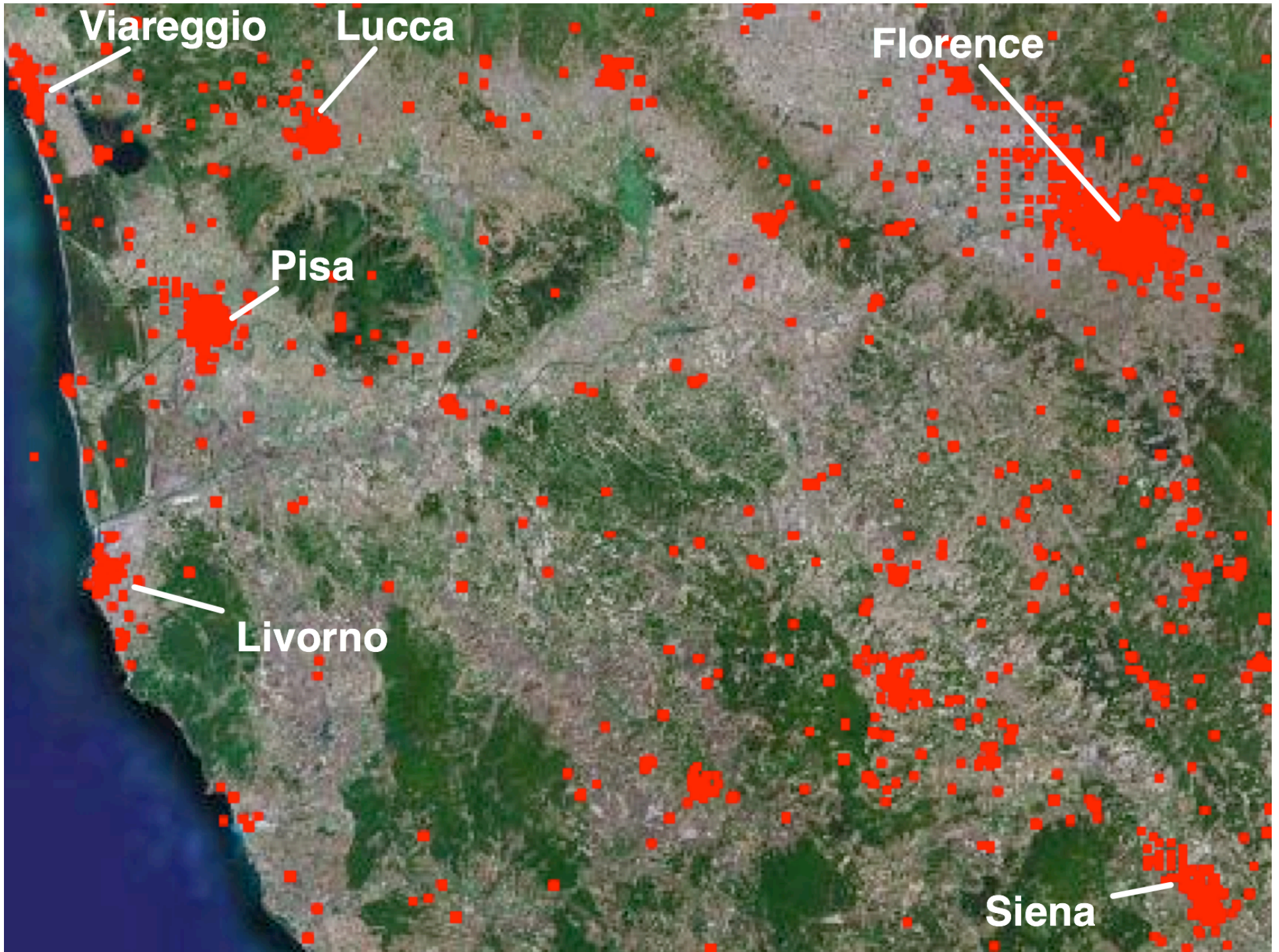
Table 5: Number of users associated to their country of "origin"

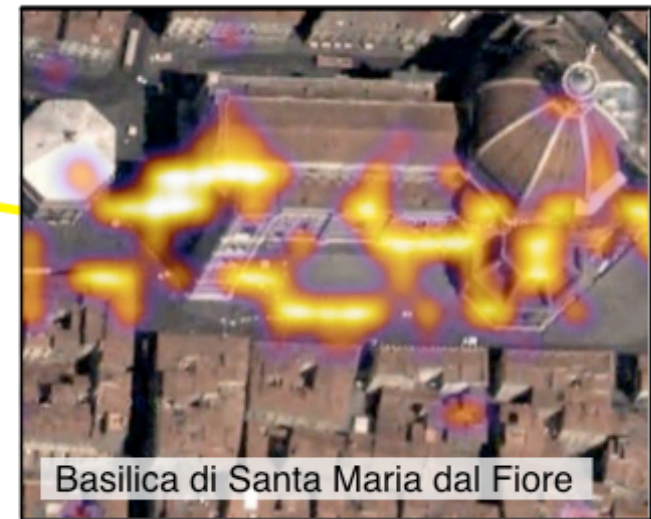
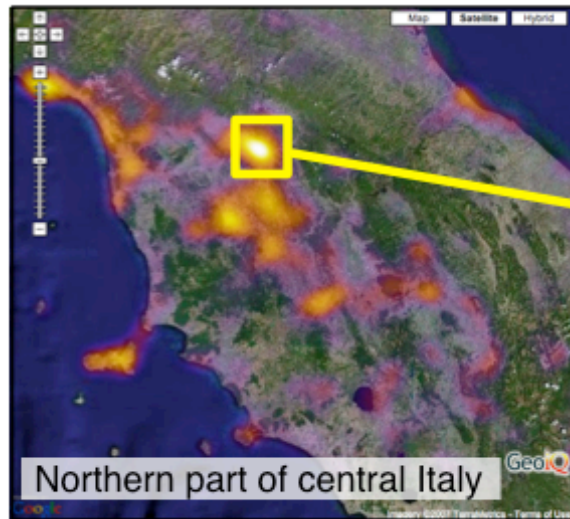
country of residence	number of users
not disclosed	1202
Italy	818
USA	440
UK	220
Germany	100
Spain	68
Canada	66
Netherlands	57
France	49
Switzerland	38
Australia	35
Belgium	23
Brazil	21

→ **Density of tourists**









Point of Interest	Users	Photos	Nb photos/user
Basilica di Santa Maria del Fiore	609	4703	7,72
Ponte Vecchio	469	1705	3,64
Plaza de la Signoria and Palazzo Vecchio	460	2692	5,85
San Gimignano	261	2795	10,71
Lungarno degli Archibuseria and Piazzale degli Uffizi	243	672	2,77
Viewpoint	189	821	4,34
Santa Croce	169	760	4,50
Ponte a Santa Trinita	139	491	3,53
Plaza de la Repubblica	151	1227	8,13
Boboli Gardens	117	752	6,43

→ **Movements of tourists (“Flickr traces”)**



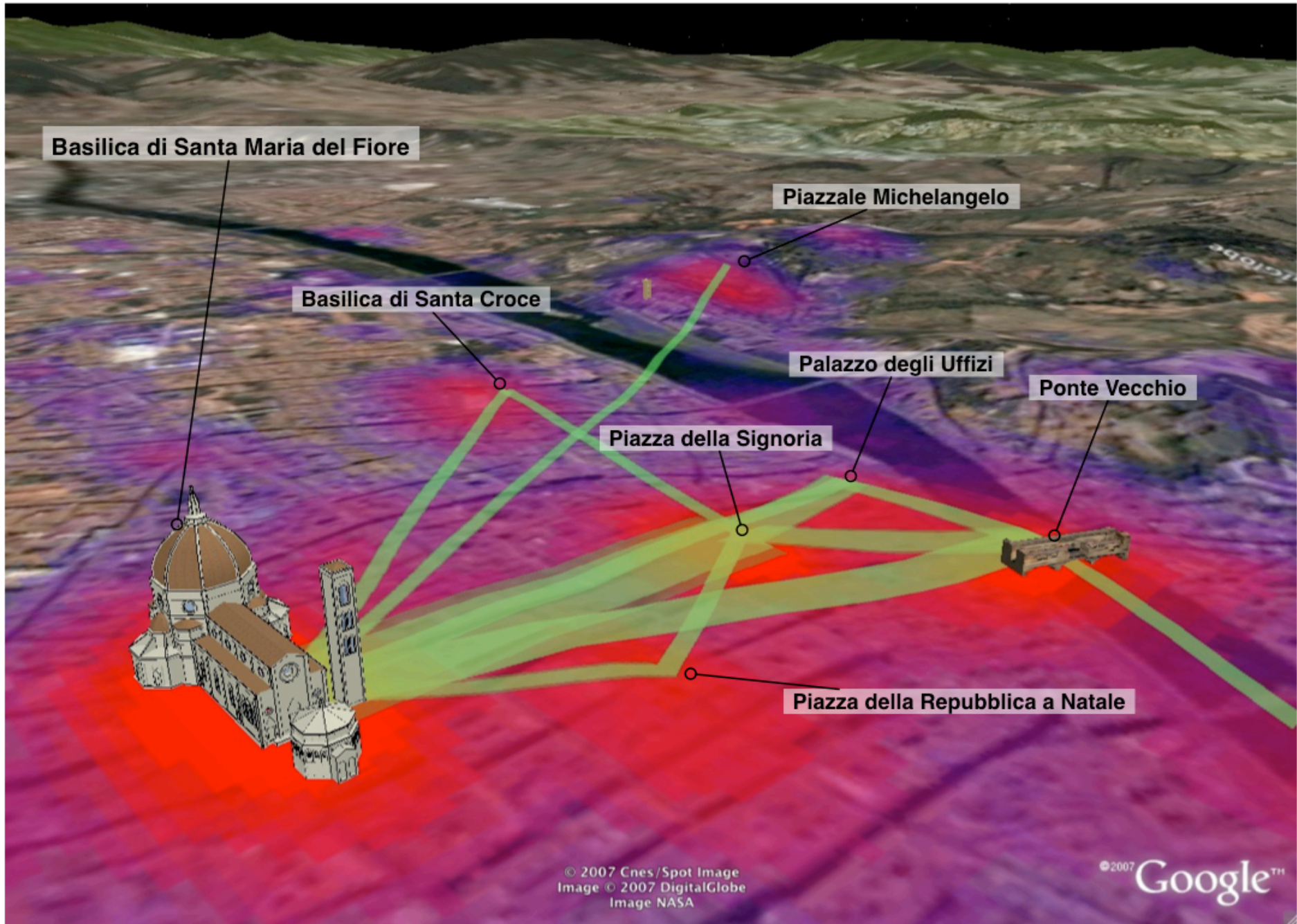
Image © 2007 TerraMetrics  
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● AMERICANS

● ITALIANS



→ **Inbound/outbound movements of tourists**



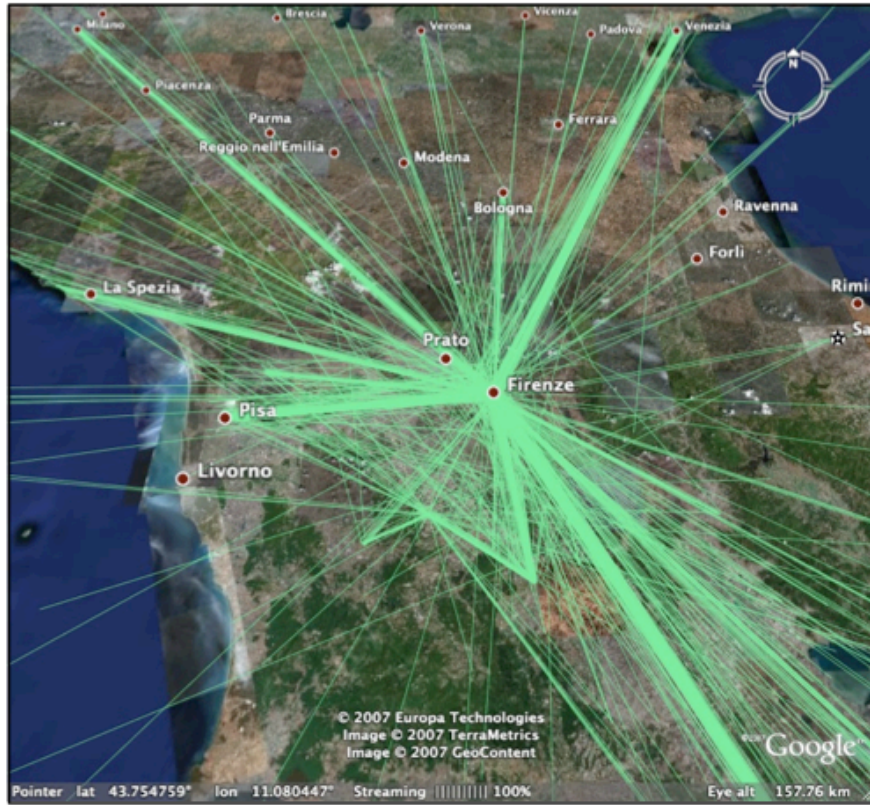
Image © 2007 TerraMetrics  
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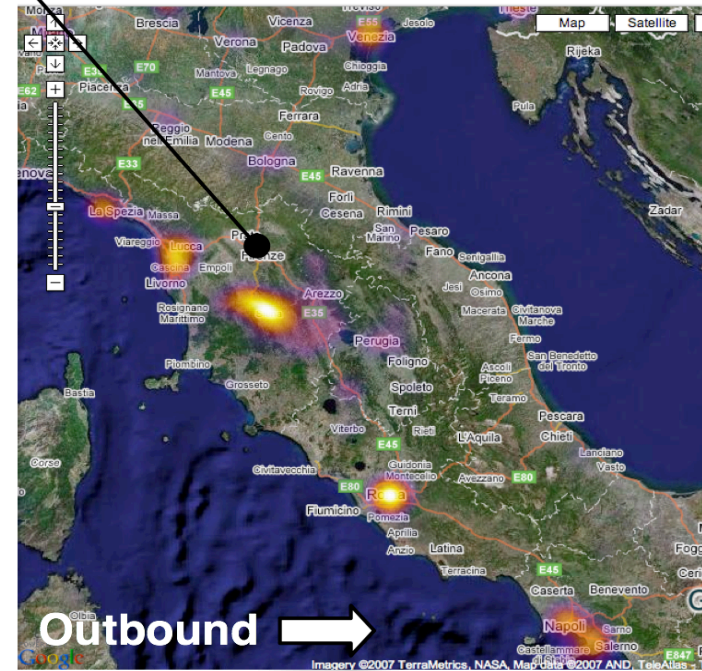
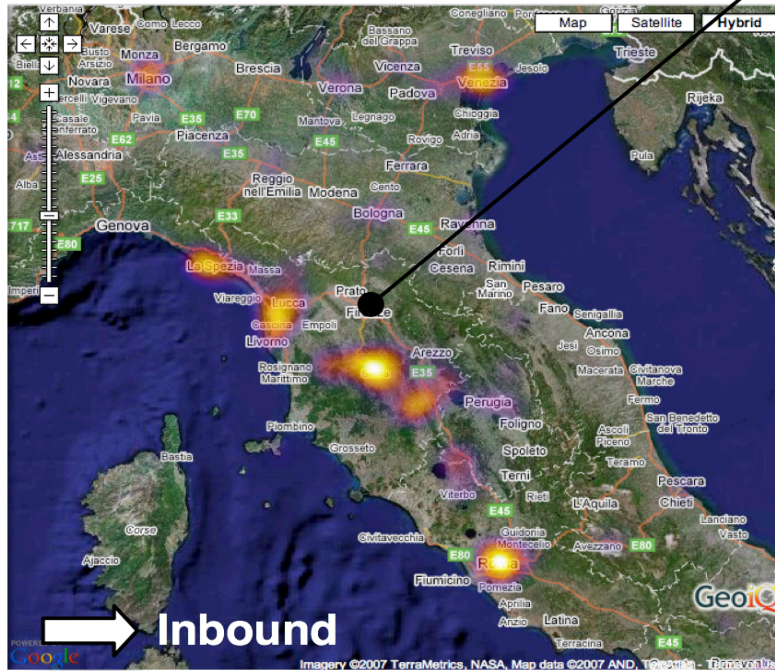
Streaming ||||| 100%

Eye alt 7987.62 km





# Florence

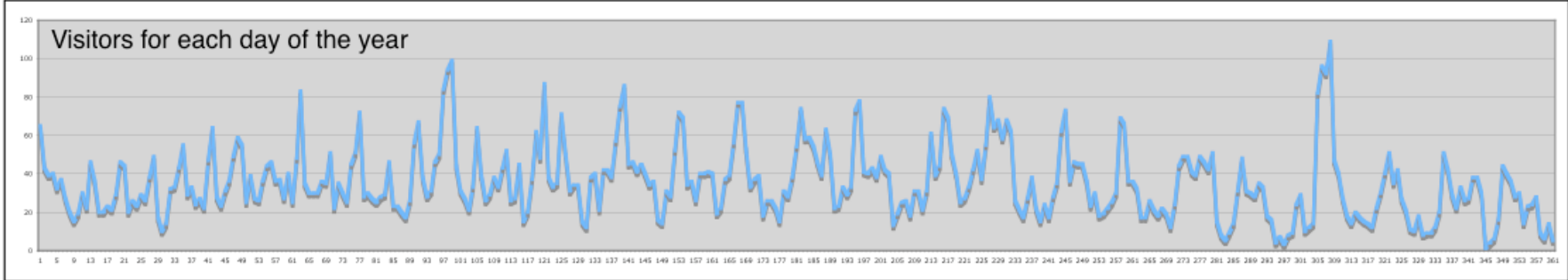
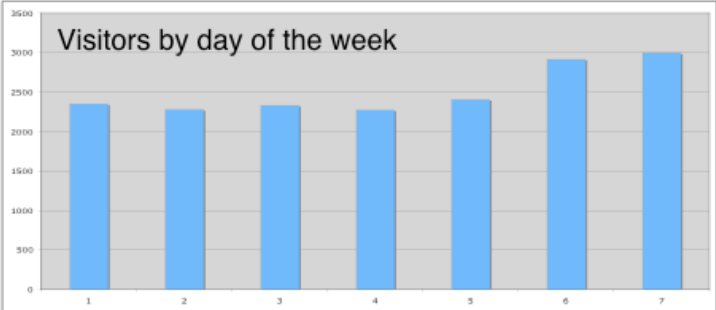
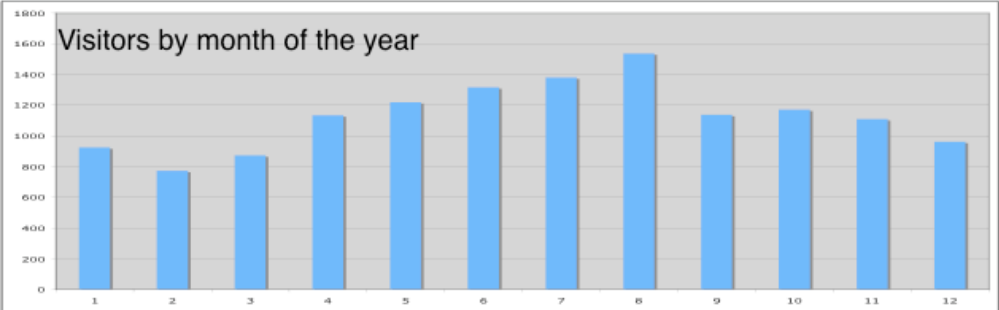


Origin	Destination	Visitors 24h
Rome	Florence	264
Venezia	Florence	162
Pisa	Florence	155
Siena	Florence	101
South Province	Florence	100

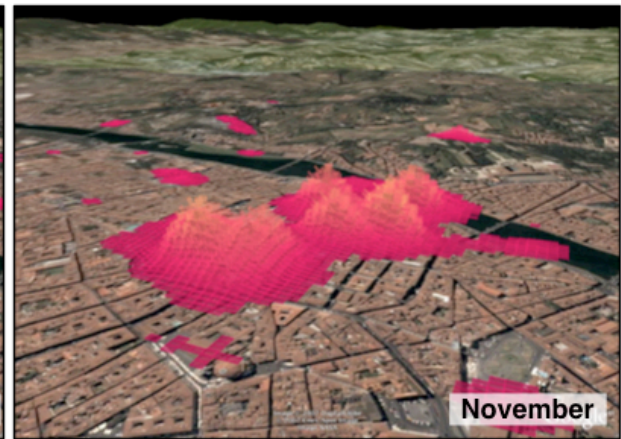
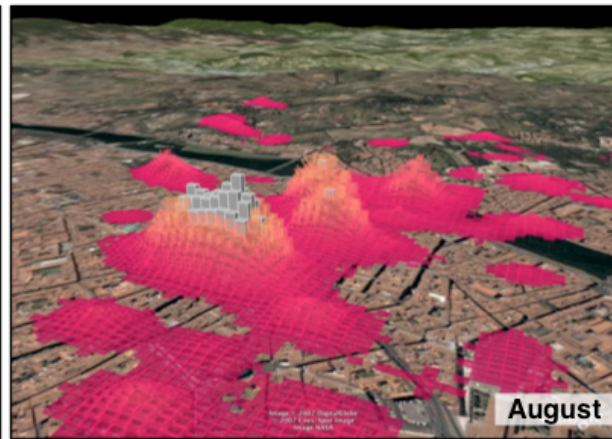
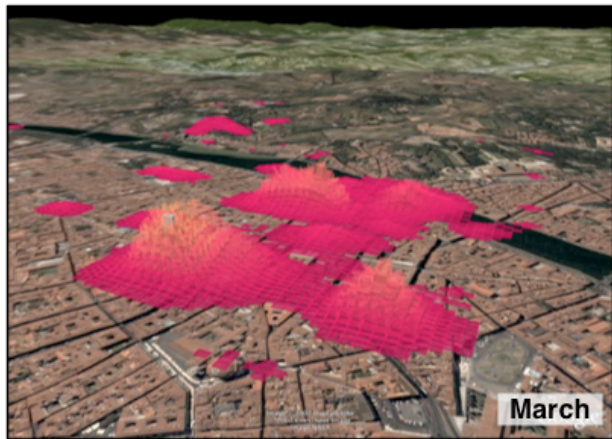
Origin	Destination	Visitors 24h
Florence	Rome	277
Florence	Pisa	173
Florence	Venezia	156
Florence	South Province	123
Florence	Siena	101

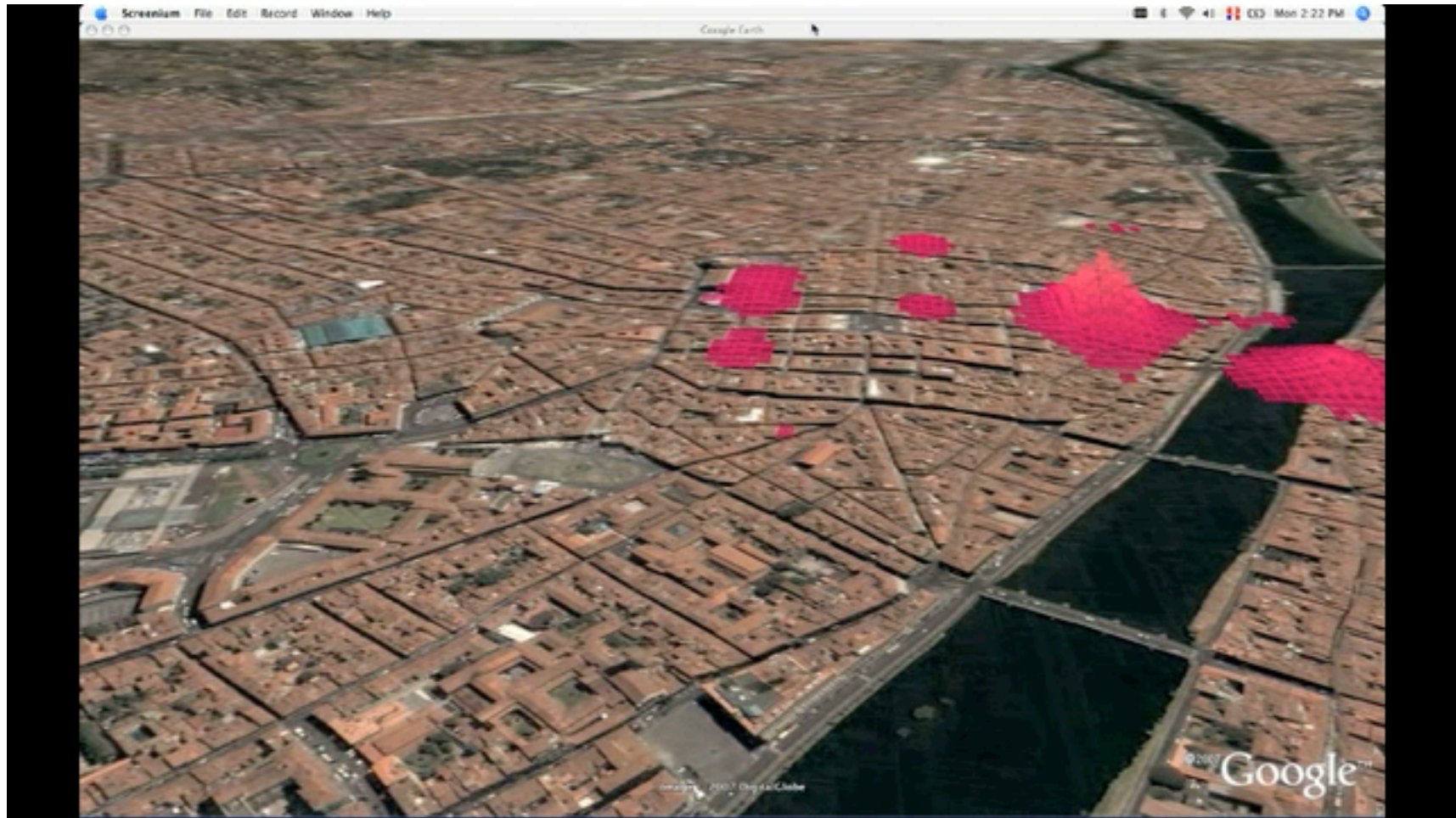
→ **Density of tourists during the year**

# Province of Florence



## **ANIMATIONS**





## WHY THIS WORK IS VERY INNOVATIVE

- Tool to absorb and map the emerging vast amount of people-generated data
- Infrastructure-free and easily scalable
- For the first time we are able to “reveal the invisible”
- Rich data due to the act of communication inherent to georeferencing a photo



## OPPORTUNITIES

- Specific database queries (i.e. per nationality)
- Devise a flow analysis tool
- Cross-validate with other data (i.e. surveys, Web 2.0)
- Return collective knowledge to users

## LIMITATIONS

- Tourist sample is skewed
- Data not fully trustable

thank you!

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