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Dar es Salaam

A SEMI-AUTOMATIC PROCEDURE FOR A DEMOGRAPHIC ANALYSIS OF THE FOSS4G DEVELOPERS' COMMUNITY

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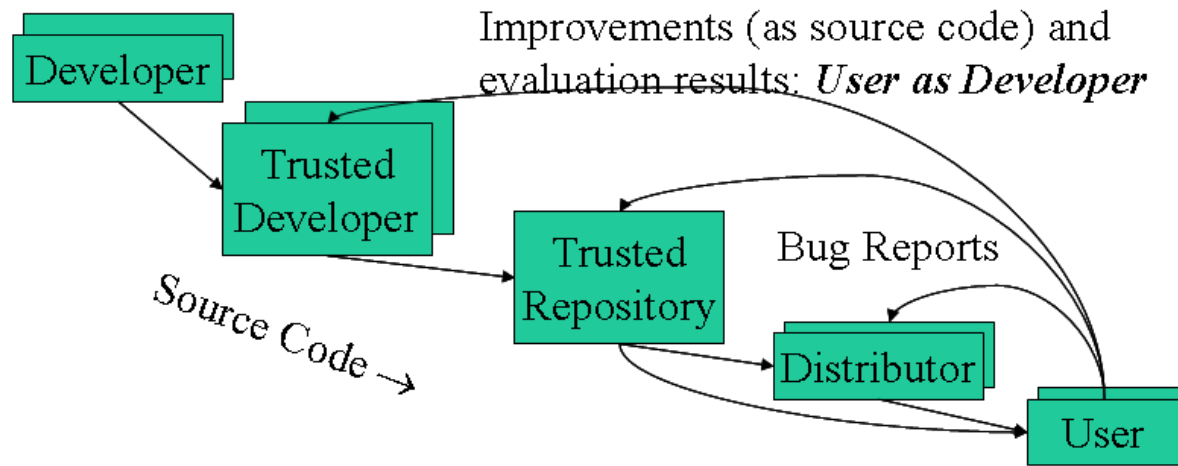
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Background

- ✓ Participation and community are the pillars of the FOSS4G movement.

Figure1. Typical OSS Development Model



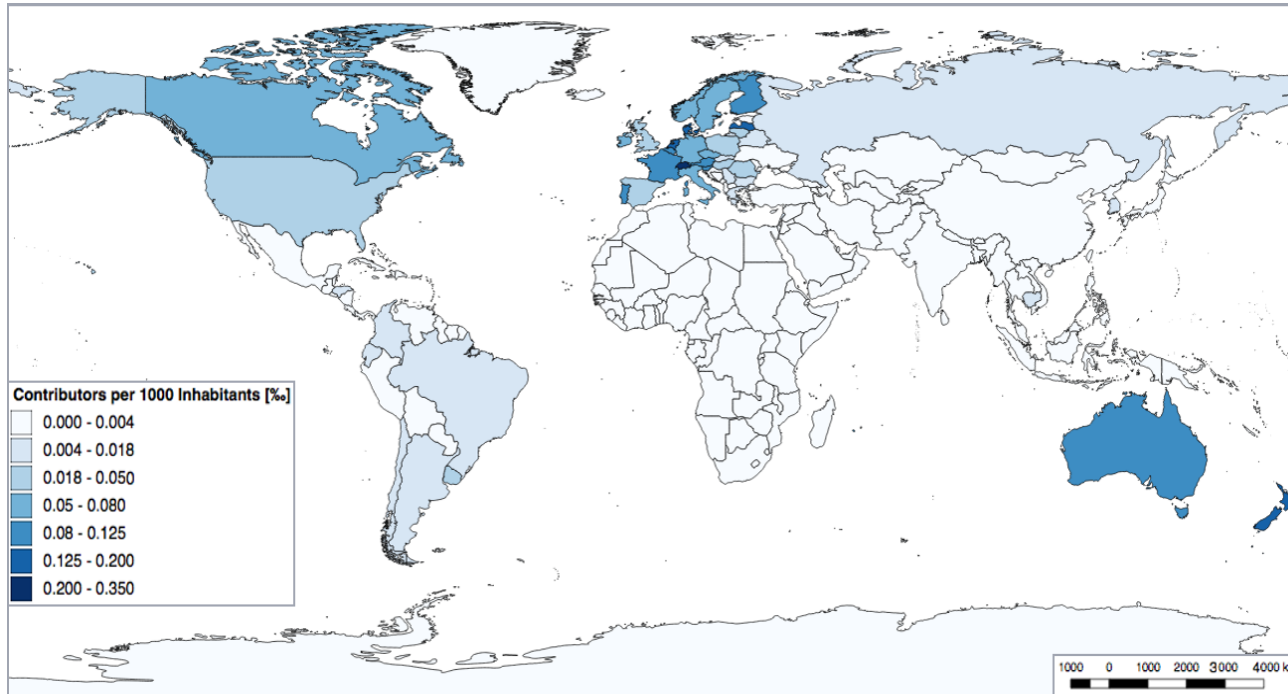
Source: David A. Wheeler. 2010. "Open Source Software in U.S. Government Acquisitions".
<https://www.dwheeler.com/essays/oss-government-acquisitions.html>

Motivations



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- ✓ How much does users from country participate in OSGeo projects?



- ✓ The goal of this work is to outline contributors on the development/maintenance of FOSS4G projects by proposing [a semi-automatic analysis](#) to investigate both the geographical arrangement and actual extension of the developers' communities.



Analysis design

- ✓ Projects selection: **OSGeo projects** and community projects (<https://www.osgeo.org>) hosted on the GitHub platform



- ✓ Data source: **GitHub REST API** (<https://developer.github.com>)

- ✓ Data collection:
 - Multiple API requests to the selected project repositories to retrieve the list of **contributors**
 - Multiple API requests to the contributors' personal profiles to retrieve their **location** (when available)



- ✓ Data analysis:
 - Counts of **contributors by each OSGeo project**
 - Geocoding + counts of **contributors by country**



Application architecture

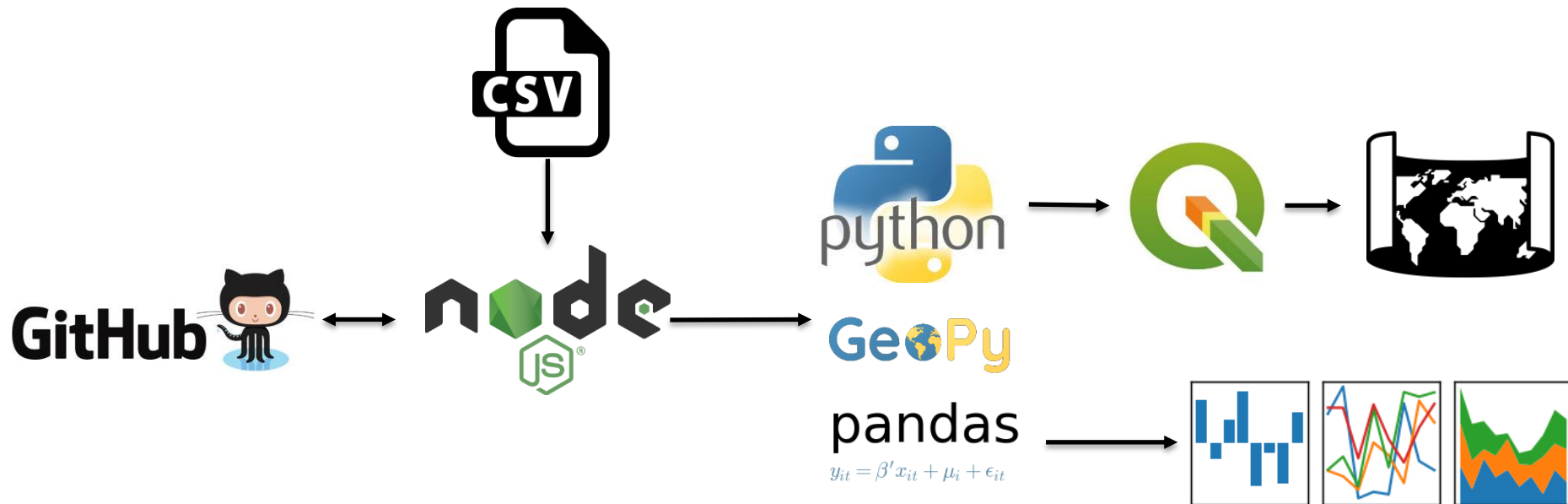


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OSGeo Projects

Data Collection

Data Analysis



Source code and user documentation available at
https://github.com/danioxoli/FOSS4G_contributors



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GitHub - danioxoli/FOSS4G_contributors

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Enabling a semi-automatic procedure for a demographic analysis of the FOSS4G developers' community

84 commits 1 branch 0 releases 2 contributors

Branch: master New pull request Find file Clone or download

GabrielePrestifilippo Update repo_list.csv ... Latest commit 1c2a42c on 14 Feb

bin	Update githubcontrib.js	6 months ago
input	Update repo_list.csv	6 months ago
lib	'message'	9 months ago
output	Delete osgeo_contributors_xy.csv	7 months ago
post_analysis	Add files via upload	6 months ago
.gitignore	'message'	9 months ago
.jshintrc	'message'	9 months ago



OSGeo projects repositories



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Branch: master ▼

[FOSS4G_contributors / input / repo_list.csv](#)

1	ALIAS	REPOLINK	OWNER	REPONAME
2	geonode	https://github.com/GeoNode/geonode	GeoNode	geonode
3	geonetwork	https://github.com/geonetwork/core-geonetwork	geonetwork	core-geonetwork
4	pycsw	https://github.com/geopython/pycsw	geopython	pycsw
5	marble	https://github.com/KDE/marble	KDE	marble
6	qgis	https://github.com/qgis/QGIS	qgis	QGIS
7	grass	https://github.com/GRASS-GIS/grass-ci	GRASS-GIS	grass-ci
8	postgis	https://github.com/postgis/postgis	postgis	postgis
9	postgis_java	https://github.com/postgis/postgis-java	postgis	postgis-java
10	ossim	https://github.com/ossimlabs/ossim	ossimlabs	ossim
11	geotools	https://github.com/geotools/geotools	geotools	geotools

https://github.com/danioxoli/FOSS4G_contributors/blob/master/input/repo_list.csv



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Data*	Count
Queried GitHub of OSGeo project repositories**	29
Entries for the contributors' collection (<i>including multiple counts for contributors to more than one project</i>)	1546
Geocoded entries for the contributors' collection (<i>including multiple counts for contributors to more than one project</i>)	864
Geocoded unique contributors	675

*collection performed on January, 16th 2018

** The list of considered repositories is available at

https://github.com/danioxoli/FOSS4G_contributors/blob/master/input/repo_list.csv



Collected data -29 OSGeo Projects

	OSGeo Projects
1	deegree3
2	gdal
3	geomajas_client
4	geomajas_server
5	geonetwork
6	geonode
7	geos
8	geoserver
9	geotools
10	geowebcache
11	grass
12	gvSIG_mobile
13	gvSIG_web
14	istsos
15	mapbender



	OSGeo Projects
16	mapfish
17	mapguide
18	mapserver
19	marble
20	openlayers
21	orfeotoolbox
22	ossim
23	pgrouting
24	postgis
25	postgis_java
26	proj
27	pycsw
28	qgis
29	teamengine



Collected data



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1546 Contributors by each OSGeo Projects

	repo	user	nationality
0	GRASS-GIS/grass-ci	wenzeslaus	
1	GRASS-GIS/grass-ci	petrasovaa	Raleigh, USA
2	GRASS-GIS/grass-ci	jachym	
3	GRASS-GIS/grass-ci	HuidaeCho	Atlanta, GA
4	GRASS-GIS/grass-ci	zarch	italy
5	GRASS-GIS/grass-ci	ostepok	
6	GRASS-GIS/grass-ci	HamishB	
7	GRASS-GIS/grass-ci	neteler	
8	GRASS-GIS/grass-ci	YannChemin	JRC, Ispra, Italy
9	GRASS-GIS/grass-ci	mlennert	
10	GRASS-GIS/grass-ci	landam	Prague, Czech Republic
11	GRASS-GIS/grass-ci	lucadelu	San Michele all'Adige (TN -Italy)
12	GRASS-GIS/grass-ci	Source: https://github.com/danioxoli/FOSS4G_contributors/blob/master/post_analysis/contributors_full.csv (Search 2018.8.10)	
13	GRASS-GIS/grass-ci		



Collected data

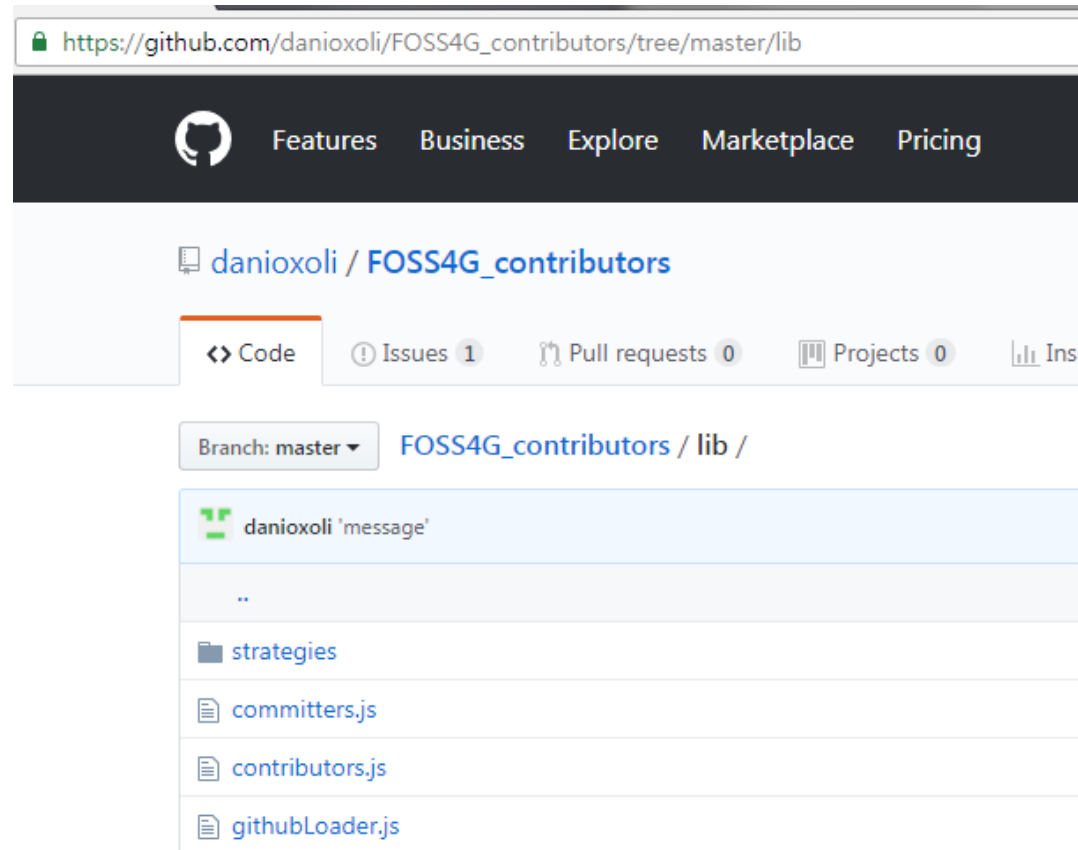


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1546 Contributors by each OSGeo Projects

Source Code:

https://github.com/danioxoli/FOSS4G_contributors/tree/master/lib

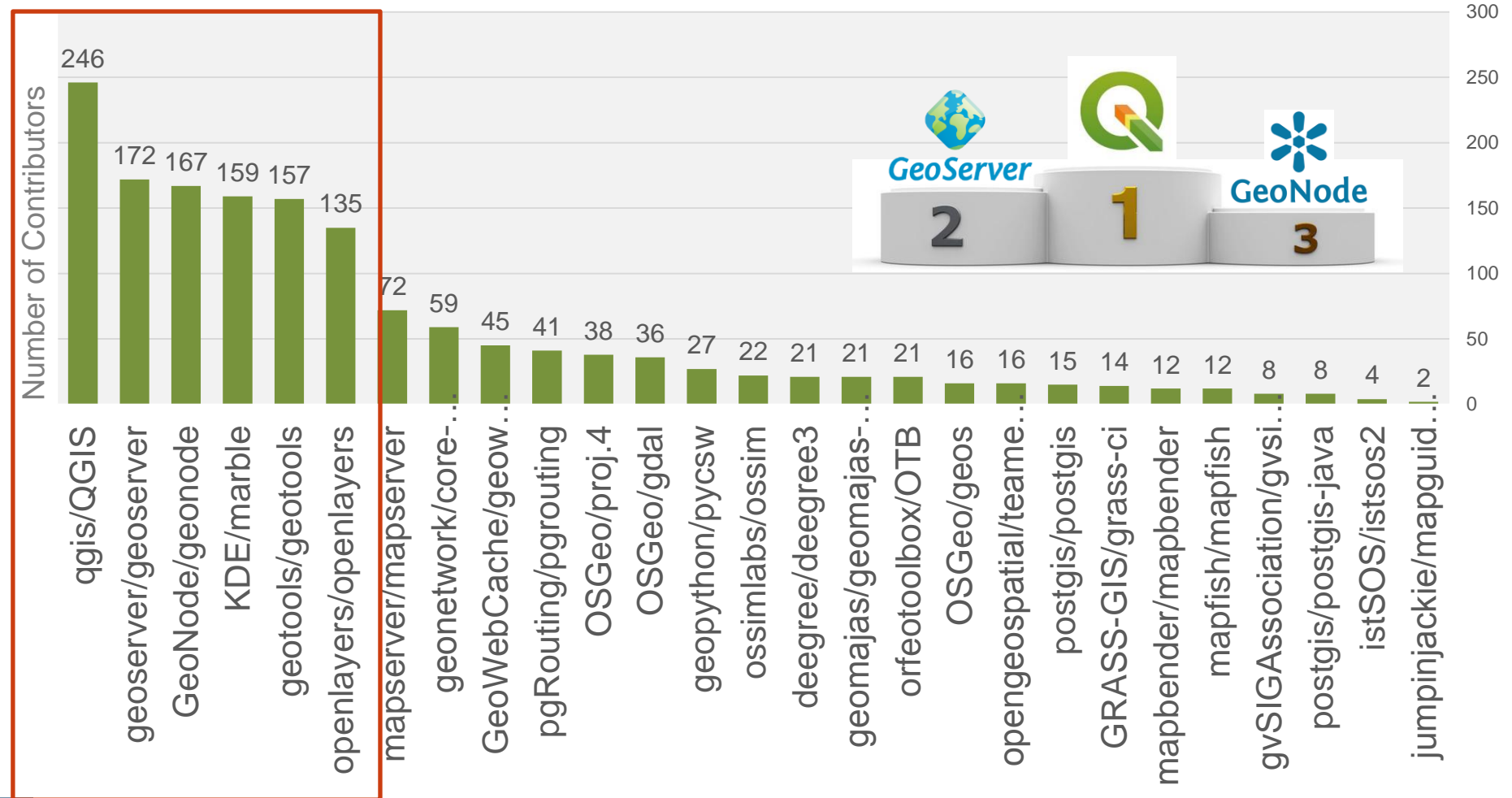


Collected data



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1546 Contributors by each OSGeo Projects





Collected data - Contributors geocoded

repo	user	nationalit	coordinate	x	y	ISO3	NAME	CONTINENT
qgis/QGIS	julienmalik	Toulouse, France	(43,6044622, 1...	1,44424690000...	43,6044622000...	FRA	France	Europe
qgis/QGIS	jtornero	Spain	(40,0028028, -...	-4,0031040000...	40,0028027999...	ESP	Spain	Europe
qgis/QGIS	thomasdziedzic	San Francisco	(37,7792808, -...	-122,41923629...	37,7792808000...	USA	United States	North America
qgis/QGIS	tmizu23	Sendai Miyagi Japan	(38,2544465, 1...	140,811597000...	38,2544465000...	JPN	Japan	Asia
qgis/QGIS	sfkeller	Rapperswil SG, S...	(47,2269198, 8...	8,82454590000...	47,2269197999...	CHE	Switzerland	Europe
qgis/QGIS	simonokeefe	Melbourne, Australia	(-37,8142176, ...	144,963160799...	-37,814217599...	AUS	Australia	Australia
qgis/QGIS	simon04	Innsbruck, Austria	(47,2654296, 1...	11,3927685000...	47,2654295999...	AUT	Austria	Europe
qgis/QGIS	Roel	Ghent, Belgium	(51,0538286, 3...	3,72501210000...	51,0538286000...	BEL	Belgium	Europe
qgis/QGIS	RCura	Paris, France	(48,8566101, 2...	2,35149920000...	48,8566100999...	FRA	France	Europe
qgis/QGIS	RobDeBagel	Melbourne, Australia	(-37,8142176, ...	144,963160799...	-37,814217599...	AUS	Australia	Australia
qgis/QGIS	opoplowski	Boulder, CO	(40,0149856, -...	-105,27054560...	40,0149856000...	USA	United States	North America
qgis/QGIS	dzolo	Slavi??n	(49,0889594, 1...	17,8748080000...	49,0889594000...	CZE	Czech Republic	Europe
qgis/QGIS	misto	Switzerland	(46,7985624, 8...	8,23197360000...	46,7985624000...	CHE	Switzerland	Europe
qgis/QGIS	rugginoso	Florence, Italy	(43,7698712, 1...	11,2555757000...	43,7698711999...	ITA	Italy	Europe
qgis/QGIS	eaglevis	Poland	(52,0977181, 1...	19,0258159000...	52,0977181000...	POL	Poland	Europe
qgis/QGIS	serval2412	France	(46,603354, 1, ...	1,88833350000...	46,6033540000...	FRA	France	Europe
qgis/QGIS	jonnyforestGIS	Coimbra	(40,2109801, -...	-8,4292057000...	40,2109801000...	PRT	Portugal	Europe
qgis/QGIS	jcomas	Salt, Girona, Spain	(41,9741672, 2...	2,79498860000...	41,9741671999...	ESP	Spain	Europe



Results: Contributors by Country

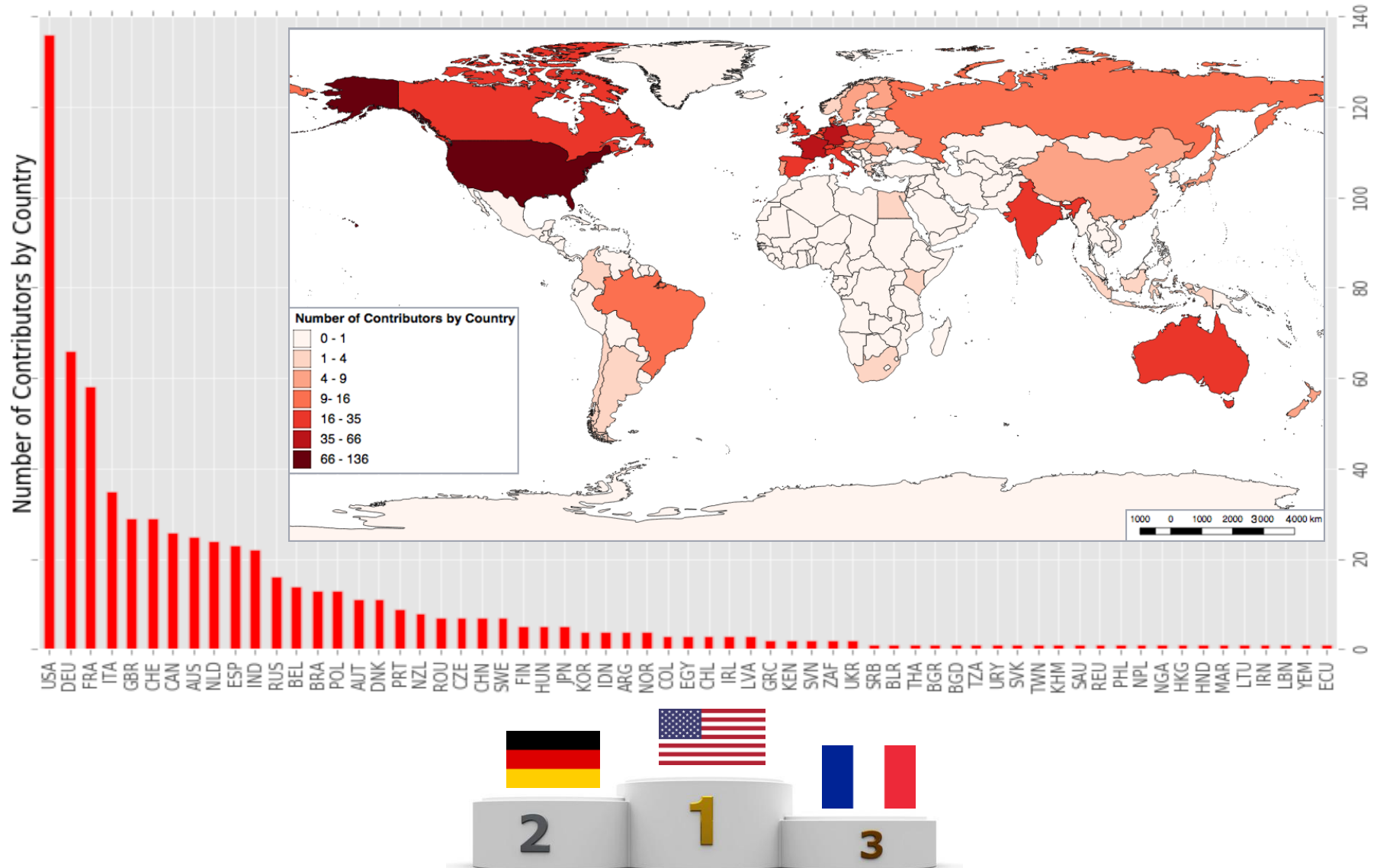


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	TOTAL CONTRIBUTORS																													
	teamengine	qgis	pysw	proj	postgis_java	postgis	pgrouting	ossim	orfeotoolbox	openlayers	marble	mapserver	mapguide	mapfish	mapbender	istos	gvSIG_web	gvSIG_mobile	grass	geowebcache	geotools	geoserver	geos	geonode	geonetwork	geomajas_server	geomajas_client	gdal	deegree3	
ARG											1										1	1	1		3					7
AUS							1			2		2									3	7	4		1	2		1		30
AUT										1	3	2									3	1	1		3					14
BEL											1										4	1		2		5	5			21
BGD										1	1												1							1
BGR																														1
BLR						1																								1
BRA							1														2			2						13
CAN											1	8									6		1	5						48
CHE												4		4		1				1	1	3		1	1					39
CHL											1													2						3
CHN							1		1												1			1						7
COL							2																	2						4
CZE										2		1							1		1									11
DEU	6						1	6			15	2			4						8	7		6	1					77
DNK										3											1	1								11
ECU															1									3						1
EGY																														3
ESP										2							1	1			2	2			5					28
FIN																					1			1						7
FRA							1			1				2							5	4	1		11					83
GBR																					2	3			2					34
GRC												1									1			1						6
HKG																														1
HND																														1
HUN																								1						5
IDN																								3						5
IND																								1						22
IRL																					1									4
IRN																					1	1								1
ITA																					9	12		4						58
JPN																								1						5
KEN																								2						2
KHM																														1
KOR																					1									4
IRN																								1						2



Results: Contributors by Country



Results: Contributors by Country population [%]

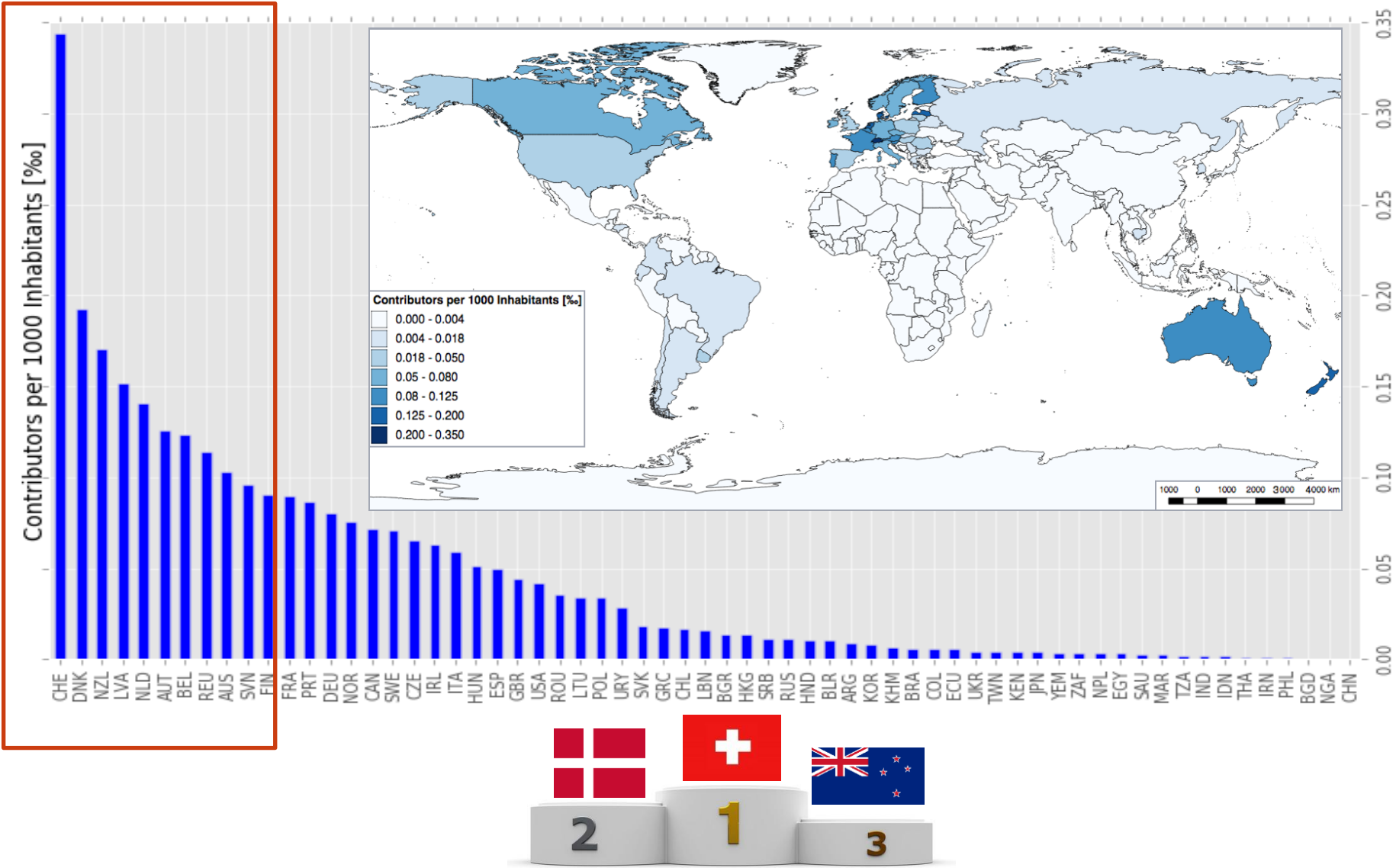


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Country Code	Country full name	Population (2017)	N. of geocoded unique contributors
ARG	Argentina	44139544	4
AUS	Australia	24213979	25
AUT	Austria	8746235	11
BEL	Belgium	11364779	14
...
BRA	Brazil	210193253	13
CAN	Canada	36436169	26
CHE	Switzerland	8429973	29
CHL	Chile	18078354	3
CHN	China	1418279549	7
COL	Colombia	49265468	3
CZE	Czech Republic	10645674	7
...
KOR	Republic of Korea	51293792	4
...

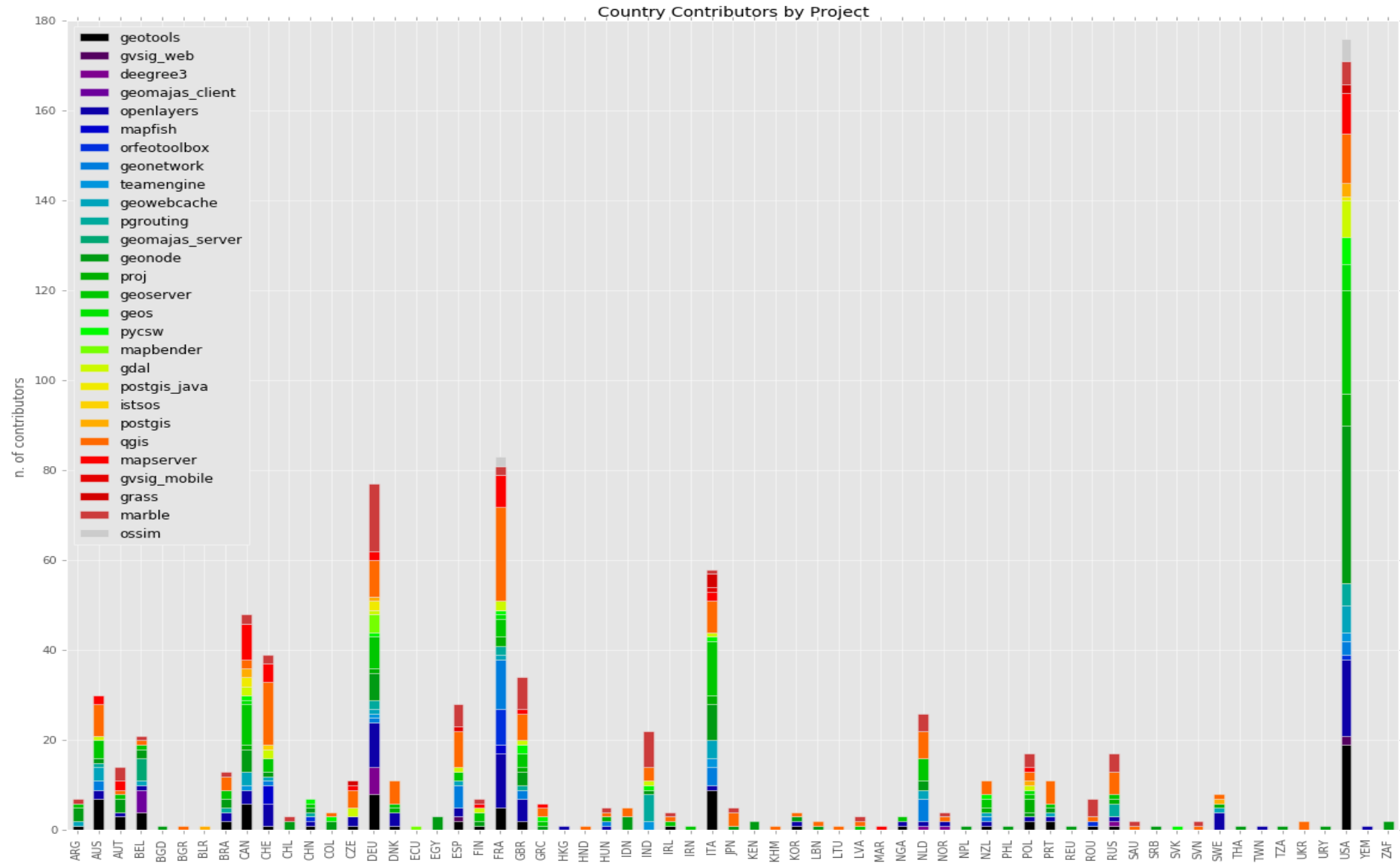


Results: Contributors by Country population [%]



Results: Distribution of country-contributors by project

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- ✓ Results **intuitively portray** the dimension and the geographical distribution of the contributors' community
- ✓ Collected data has to be intended as a sample of the whole FOSS4G developers' community because of the data limitations
- ✓ The **source code** of the software application developed for this work is available with an **open** license on GitHub enabling future improvements
- ✓ A periodical repetition of the analysis might help in **assessing and monitoring the evolution and the degree of activity of the global FOSS4G developers' community**

Research limitations (Input Data)

- ✓ Incomplete information for the contributors' locations which depends on the personal account settings
- ✓ Not all the OSGeo projects are hosted on GitHub
- ✓ There exist multiple GitHub repositories on which OSGeo projects development is carried out
- ✓ 5000 requests per hour for authenticated users (request-rate limited of GitHub Search API might be an issue for larger survey).

Data has to be intended a sample of the whole contributors' community which representativeness might vary from project to project





Future Work

- ✓ Repeat monitoring to see evolution of OSGeo projects in terms of contributors regularly.
- ✓ Expand the experiment to other FOSS4G projects
- ✓ Improving the contribution model of FOSS4G by considering quality of contribution with a different weight, not only just a simple number of contributors.



Thanks for your attention!

...Questions?

