



**ANNOUNCING NAMSORML DEEP LEARNING FOR #GEOINT :
DECRYPTING IDENTITY IN SPACE AND TIME THROUGH
PERSONAL NAMES, GEOGRAPHIC, SEMANTIC, GRAPH DATA**

2018-01

Elian CARSENAT, NamSor

Founder Bio



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Elian CARSENAT, a computer scientist trained at ENSIIE/INRIA, started his career at JP Morgan in Paris in 1997. He later worked as consultant and managed business & IT projects in London, Paris, Moscow and Shanghai.

In 2012, Elian created **NamSor**, a piece of sociolinguistics software to mine the 'Big Data' and better understand international flows of money, ideas and people.

<http://fr.linkedin.com/in/eliancarsenat/en>

Two NamSor product lines

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NamSor CORE

- ❑ Optimized for global coverage : coding names to a large multi-class taxonomy (all countries / regions / ethnicities)
- ❑ The only input is NAMES : not other information is required
- ❑ SaaS API or on-premises software licensed per CPU
- ❑ Includes 4 proprietary onomastics models (.ONO)

NamSor ML

NEW!

- ❑ Deep-learning capability to re-train models towards a focused research or a customized taxonomy (binary classifier, or just a few classes)
- ❑ Name information is combined with other data (geographic, behavioural, semantic ...)
- ❑ On-premises software licensed per CPU
- ❑ Includes 4 word-embedding models (FastText or W2V)

NamSor ML key functions

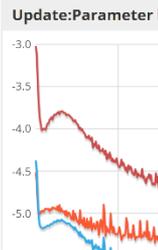
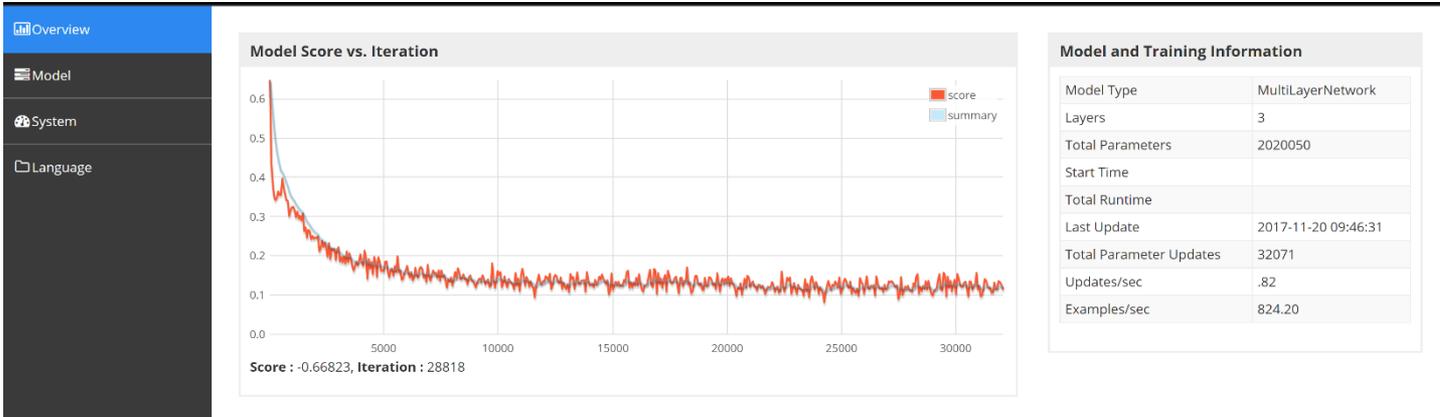
custom classifiers for race / ethnicity / migration studies

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- State-of-the-art **Deep Learning** (Neural Network)
- Same NamSor CORE models are available as **pre-trained models** for word embedding, both in Word2Vec (W2V) and FastText (BIN) formats:
 - ▣ COUNTRY_MELTINGPOTS_GENDER_SCRIPT
 - ▣ COUNTRY_REGION_SCRIPT
 - ▣ COUNTRY_SCRIPT
 - ▣ ETHNO_COUNTRY_SCRIPT
- Software is licensed as a SDK/Framework with samples for use and integration.

NamSor ML : Native Hawaiian Names - A Binary Classifier Example

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Nov 20, 2017 9:49:39 AM com.namsor.namsorml.us_hi.MLPNamSorHawaiiTrainer main

INFO:

Examples labeled as 0 classified by model as 0: 21857 times

Examples labeled as 0 classified by model as 1: 7731 times

Examples labeled as 1 classified by model as 0: 2194 times

Examples labeled as 1 classified by model as 1: 221318 times

=====Scores=====

of classes: 2
Accuracy: 0.9608
Precision: 0.9375
Recall: 0.8644
F1 Score: 0.9781

Nov 20, 2017 9:49:39 AM com.namsor.namsorml.us_hi.MLPNamSorHawaiiTrainer main

INFO: *****Example finished*****

NamSor ML :

US – input Name+ZIP code; output : race/ethnicity

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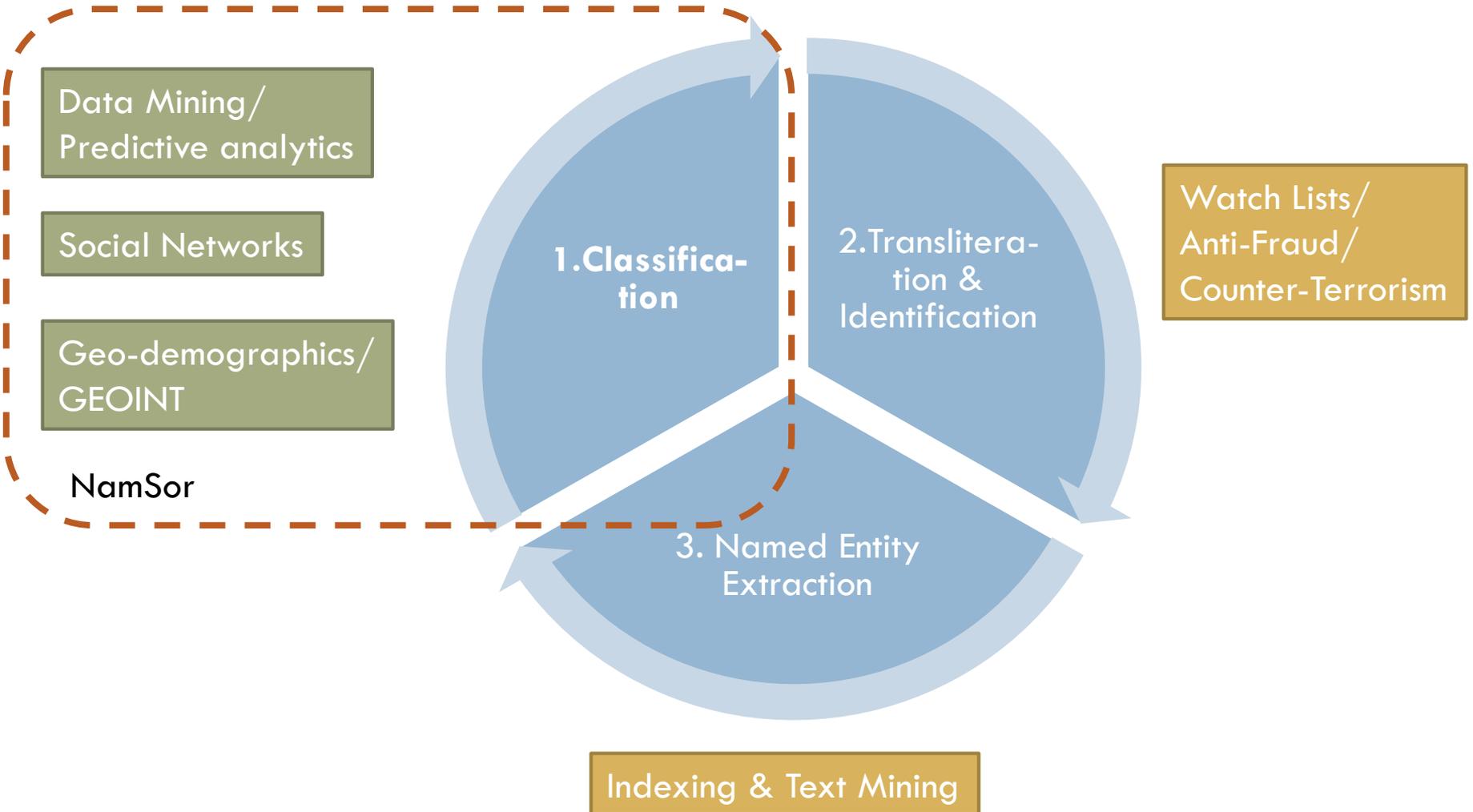
The screenshot displays the DL4J Training UI interface. On the left is a navigation menu with 'Overview', 'Model', 'System', and 'Language'. The main area is divided into two panels. The left panel, titled 'Model Score vs. Iteration', shows a line graph where the 'score' (red) and 'summary' (blue) both decrease from approximately 1.25 to 0.50 over 128 iterations. The right panel, 'Model and Training Information', lists: Model Type: MultiLayerNetwork, Layers: 3, Total Parameters: 2848884, Start Time, Total Runtime, Last Update: 2017-12-21 13:14:05, Total Parameter Updates: 4591, and Updates/sec: .66. A large text box at the bottom contains the following log output:

```
manual exit requested ... breaking training at epoch 128
Dec 25, 2017 3:07:48 PM com.namsor.namsorml.us_zip5.MLPNamSorZIP5Trainer main
INFO: Evaluate model...
Dec 25, 2017 3:10:13 PM com.namsor.namsorml.us_zip5.MLPNamSorZIP5Trainer main
INFO:
=====Scores=====
# of classes: 4
Accuracy: 0.7940
Precision: 0.8294
Recall: 0.7789
F1 Score: 0.8008
Precision, recall & F1: macro-averaged (equally weighted avg. of 4 classes)
=====
Dec 25, 2017 3:10:13 PM com.namsor.namsorml.us_zip5.MLPNamSorZIP5Trainer main
INFO: *****Example finished*****
```

□ ABOUT NAMSOR

NamSor is focused on classification

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NamSor sorts Names



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- Classification with various taxonomies
 - Gender (female/ male / unknown)
 - Script (LATIN, ARABIC, GUJARATI,...)
 - Origine (Country ex. France vs. Inde)
 - Region (ex. Gujarat vs. Andhra Pradesh)
 - Diaspora (ex. Indian Diaspora in US vs Indian Diaspora in Mauricius)
- Sorting according to a numerical score, allowing combining NamSor with other algorithm (graph, semantics, predictive ...)
- Flexibility to learn new taxonomies (machine learn.)
- Ease of integration (NamSor API, Java/Python SDK, ESRI, RapidMiner, NationBuilder ...)



A global coverage - 142+ countries

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DIMENSION	CURRENT COVERAGE
SCRIPT (22)	LATIN, ARABIC, CYRILLIC, ARMENIAN, BENGALI, DEVANAGARI, GEORGIAN, GREEK, GUJARATI, GURMUKHI, HAN, HANGUL, HEBREW, HIRAGANA, KANNADA, KATAKANA, MALAYALAM, MYANMAR, ORIYA, TAMIL, TELUGU, THAI
COUNTRY (142+)	AE, AF, AL, AM, AO, AR, AT, AZ, BA, BD, BE, BF, BG, BH, BI, BJ, BN, BR, BT, BW, BY, CA, CD, CF, CG, CH, CI, CL, CM, CN, CO, CR, CV, CY, CZ, DE, DK, DZ, EE, EG, ER, ES, ET, FI, FJ, FR, GA, GB, GE, GH, GM, GN, GR, HK, HR, HT, HU, ID, IE, IL, IN, IQ, IR, IS, IT, JO, JP, KE, KG, KH, KM, KP, KR, KW, KZ, LA, LB, LK, LR, LS, LT, LU, LV, LY, MA, MD, ME, MG, MK, ML, MM, MN, MR, MU, MV, MW, MX, MY, MZ, NA, NE, NG, NL, NO, NP, OM, PE, PH, PK, PL, PS, PT, QA, RO, RS, RU, RW, SA, SD, SE, SI, SK, SN, SO, SR, SY, TD, TG, TH, TJ, TM, TN, TO, TR, TT, TW, TZ, UA, UG, US, UZ, VE, VN, YE, ZA, ZM, ZW
COUNTRY/ REGION (15)	RU (80), IN (~30), FR (22), IT (17), LB (14), BF (13), CD (8), TR (7), ID (7), GB (4), ES (17), ML (50), GN (8), CI (34), AF(16)
COUNTRY/ DIASPORA	US, CA, SG, GB, (EU)

Detailed functional coverage

A complex n-dimension matrix

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□ According to script / country :

- Ex. recognizing an Armenian name in LATIN, ARABIC, CYRILLIC, or GEORGIAN ?

nikoloz doborjginidze
 Տարիելովսա Տարիելաշվիլի
 ნანული ყაზარაშვილი
 николез доборджгинидзе
 کریکور انترانیک طاکسیان

	ARABIC	ARMENIAN	CYRILLIC	GEORGIAN	LATIN
Armenian	X	X	X	.	X
Georgian	.	X	X	X	X

	Maghrebi				Egyptian	Gulf						Hassaniya	Levantine				Mesopotamian	Sudanese	Yemeni			Other						
	DZ	LY	MA	TN	EG	AE	BH	KW	OM	QA	SA	MR	JO	LB	PS	SY	IQ	SD	YE	SO	DJ	ID	IN	PK	MY	IR	AM	Other
LATIN	X	x	X	X	X	x	X	x	x	x	X	X	X	X	X	X	x	x	x	x	.	x	X	X	x	X	X	X
ARABIC	x	x	X	X	X	x	X	x	x	x	X	X	X	X	X	X	X	x	X	.	.	x	x	x	x	X	X	.

□ According to host / origin country :

- Ex. recognizing an Georgian name in the US, in Russia, in Europe?

NamSor CORE key functions

to quickly re-calibrate a model

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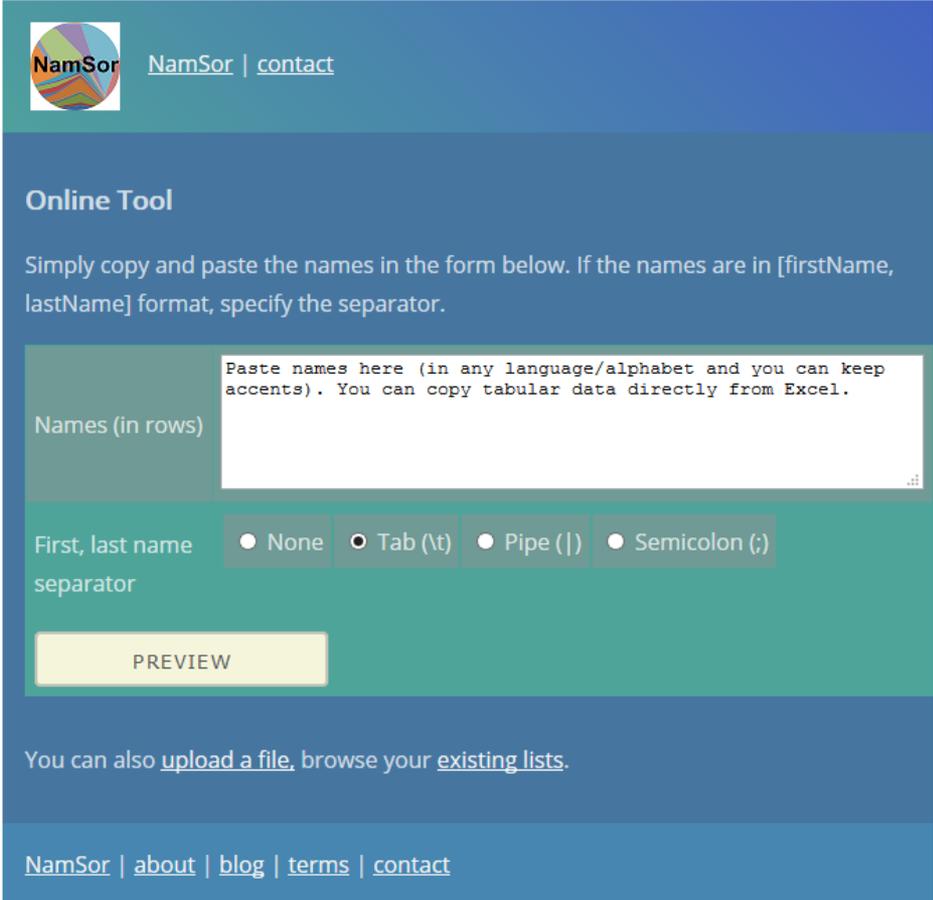
- Machine learning
 - Hierarchical taxonomies
 - ▣ Ex. Country / Region
 - Automatic clustering
 - ▣ Name – Surname, Father/Mother Name
 - ▣ Real Name – Pseudonym
 - Multiple iterations, using Score to sort data
- + a proven methodology to qualify data sources

NamSor CORE Technical features

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- Software as a Service (SaaS),
 - ▣ Online processing (Excel ou UTF-8 txt)
 - ▣ NamSor API (REST)
 - ▣ NamSor SDK (Java, Python, Scala)
 - ▣ NamSor add-on for RapidMiner, NationBuilder, ...
 - ▣ 3 taxonomies : Gender, Origin, Diaspora
 - ▣ 99.9% availability
 - ▣ Throughput: ~1000 names per second (~100 millions names per day)

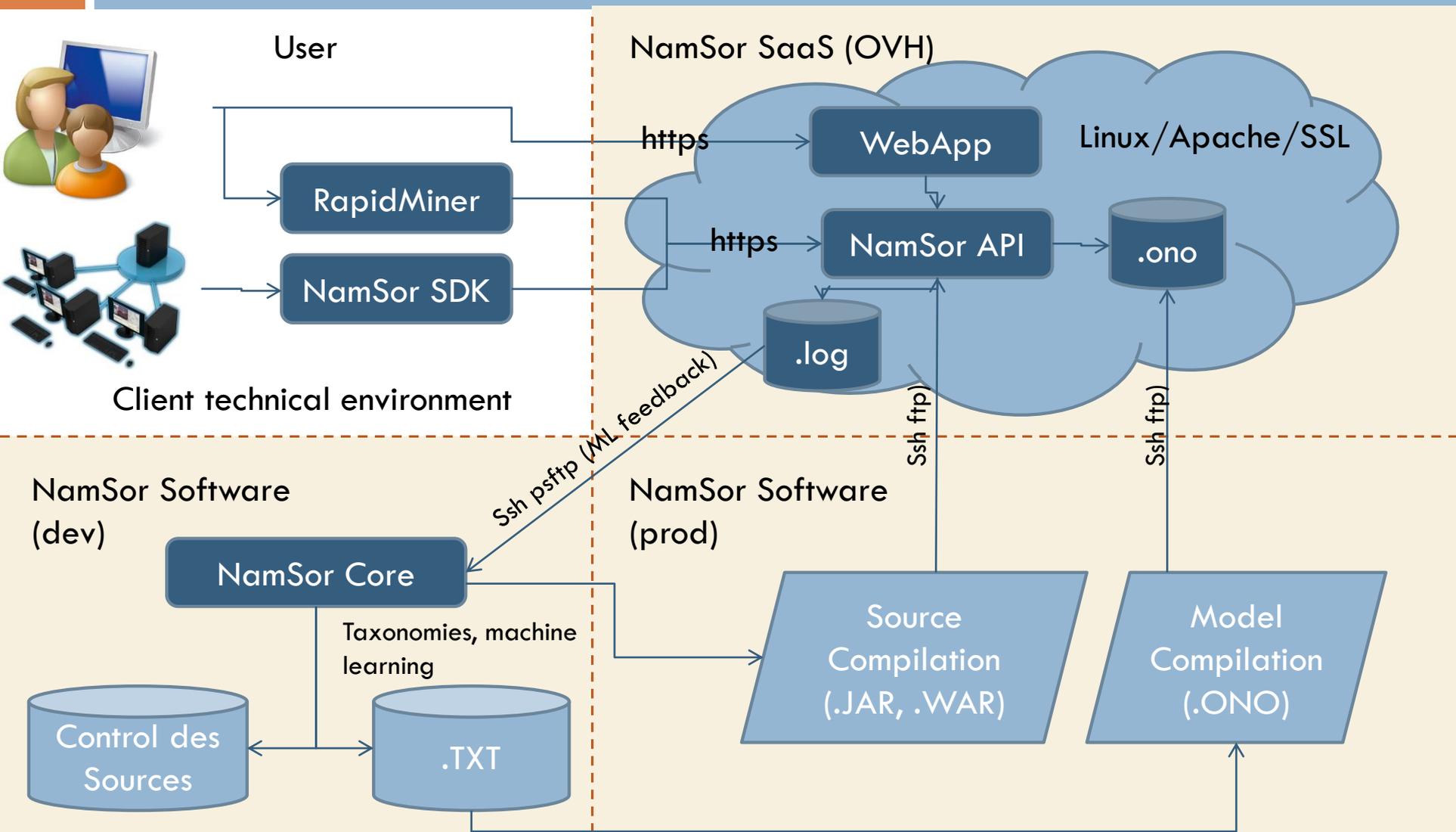
- On-site software deployment,
 - ▣ Hardware: 2x Servers (4c/8t, 3GHz+, 64GB, 2x2TB)
 - ▣ Linux/Java or Scala/Spark



The screenshot shows the NamSor online tool interface. At the top left is the NamSor logo, followed by navigation links for "NamSor" and "contact". The main heading is "Online Tool". Below this is a descriptive text: "Simply copy and paste the names in the form below. If the names are in [firstName, lastName] format, specify the separator." A text input area is labeled "Names (in rows)" and contains a placeholder instruction: "Paste names here (in any language/alphabet and you can keep accents). You can copy tabular data directly from Excel." Below the input area are radio buttons for selecting a separator: "None", "Tab (\t)", "Pipe (|)", and "Semicolon (;)". A "PREVIEW" button is located below the separator options. At the bottom of the interface, there is a link to "upload a file" and "browse your existing lists". The footer contains navigation links for "NamSor", "about", "blog", "terms", and "contact".

NamSor CORE SaaS architecture

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Confidentiality, data protection

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- ❑ Software Licence + Confidentiality Agreement
- ❑ As Input : names only (no other personal data)
- ❑ Secure Data Center and ‘Cloud’, accessed via SSH
- ❑ NamSor API over HTTPS
- ❑ Two logging options :
 - ❑ In clear (for machine learning)
 - ❑ As SHA-256 (for confidentiality) ex. Jean Durieux becomes
ef61a579c907bbbed674c0dbcbcf7f7af8f851538eef7b8e58c5bee0b8cfdac4a

Technical Details

Connection Encrypted (TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA, 128 bit keys, TLS 1.2)

The page you are viewing was encrypted before being transmitted over the Internet.

Encryption makes it difficult for unauthorized people to view information traveling between computers. It is therefore unlikely that anyone read this page as it traveled across the network.

- NamSor use cases

Tunisian Diaspora

La BIAT lance un road show pour les tunisiens en île de France

Le 17 mars 2016, BIAT France lance le « BIAT France Tour » et part à la rencontre des Tunisiens résidents à Paris et en région parisienne afin de leur présenter les produits et services qui leur sont destinés.



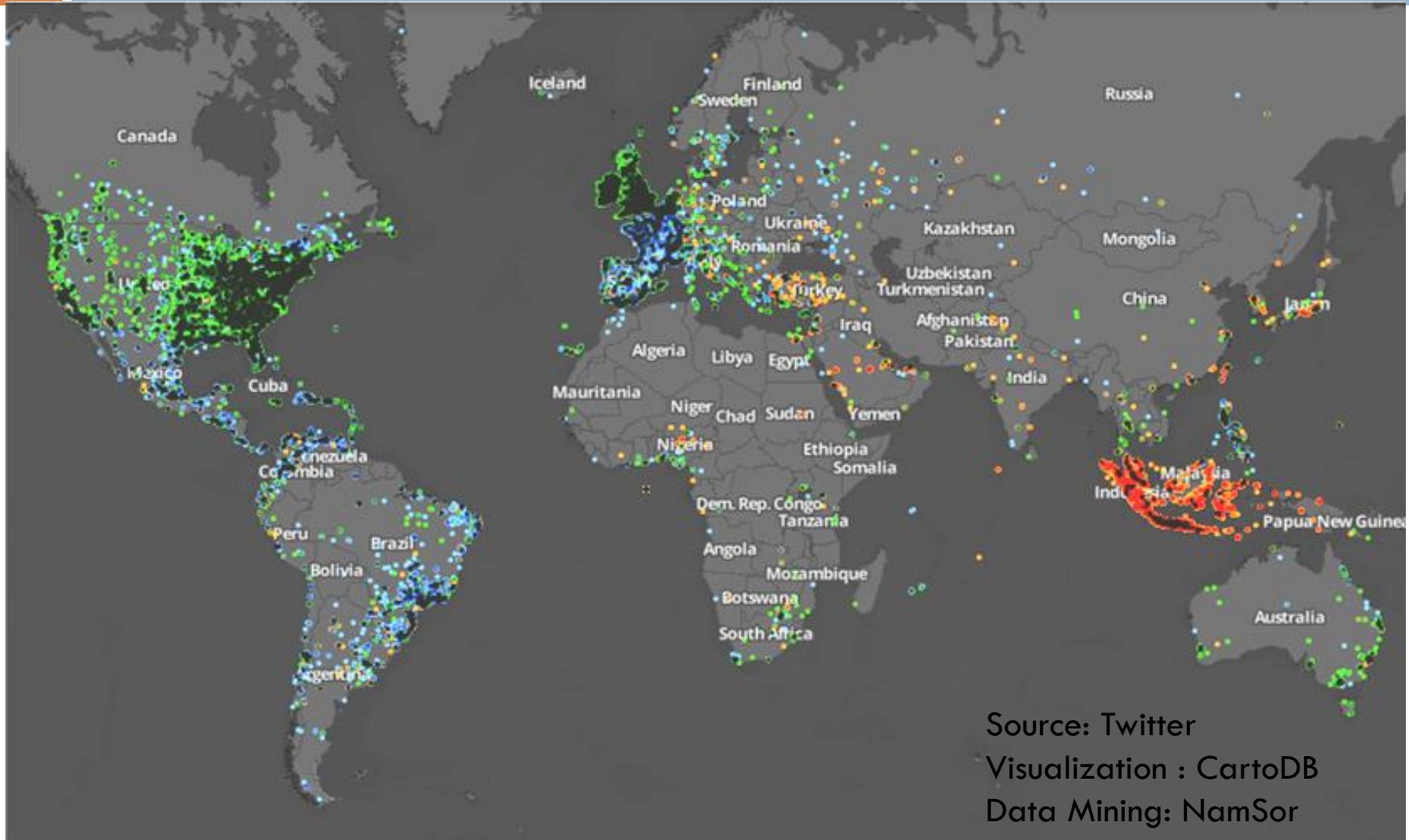
C'est aux 720 000 Tunisiens vivant en France que la BIAT s'adresse avec sa filiale BIAT France, sous la signature « Ici pour vous », un service de transfert d'argent leur est proposé à des prix très compétitifs et dans des conditions de rapidité et de sécurité exemplaires.



Mining 3M twitter names to map *Diasporas*

Who are they, where are they and what are they doing?

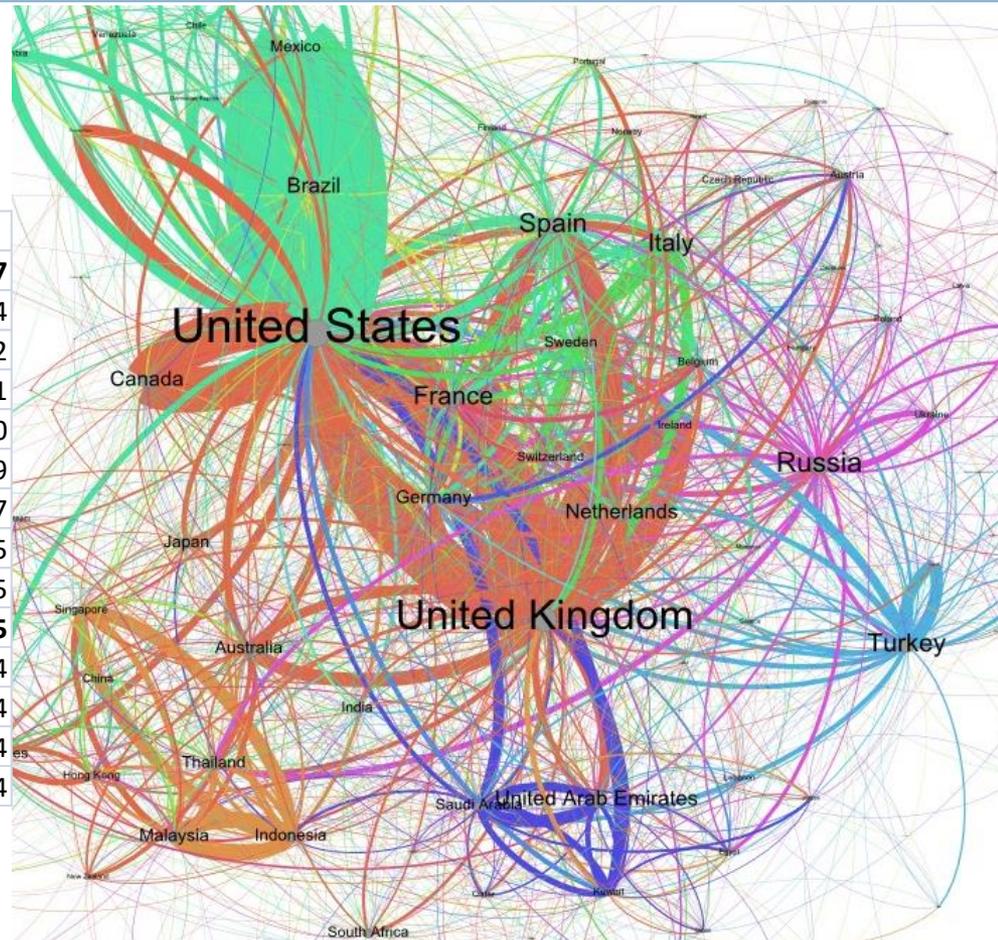
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Flow view – who travels where?

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Source	Target	Type	Id	Onoma	Weight
United Kingdom	France	Directed	16	Great Britain	37
Spain	France	Directed	55	Spain	14
United States	France	Directed	75	Great Britain	12
Turkey	France	Directed	79	Turkey	11
Brazil	France	Directed	87	Portugal	10
United Kingdom	France	Directed	112	Ireland	9
Italy	France	Directed	152	Italy	7
Switzerland	France	Directed	226	France	5
Belgium	France	Directed	247	France	5
United Kingdom	France	Directed	258	France	5
Mexico	France	Directed	287	Spain	4
Ireland	France	Directed	317	Great Britain	4
United Kingdom	France	Directed	333	Italy	4
United States	France	Directed	375	France	4

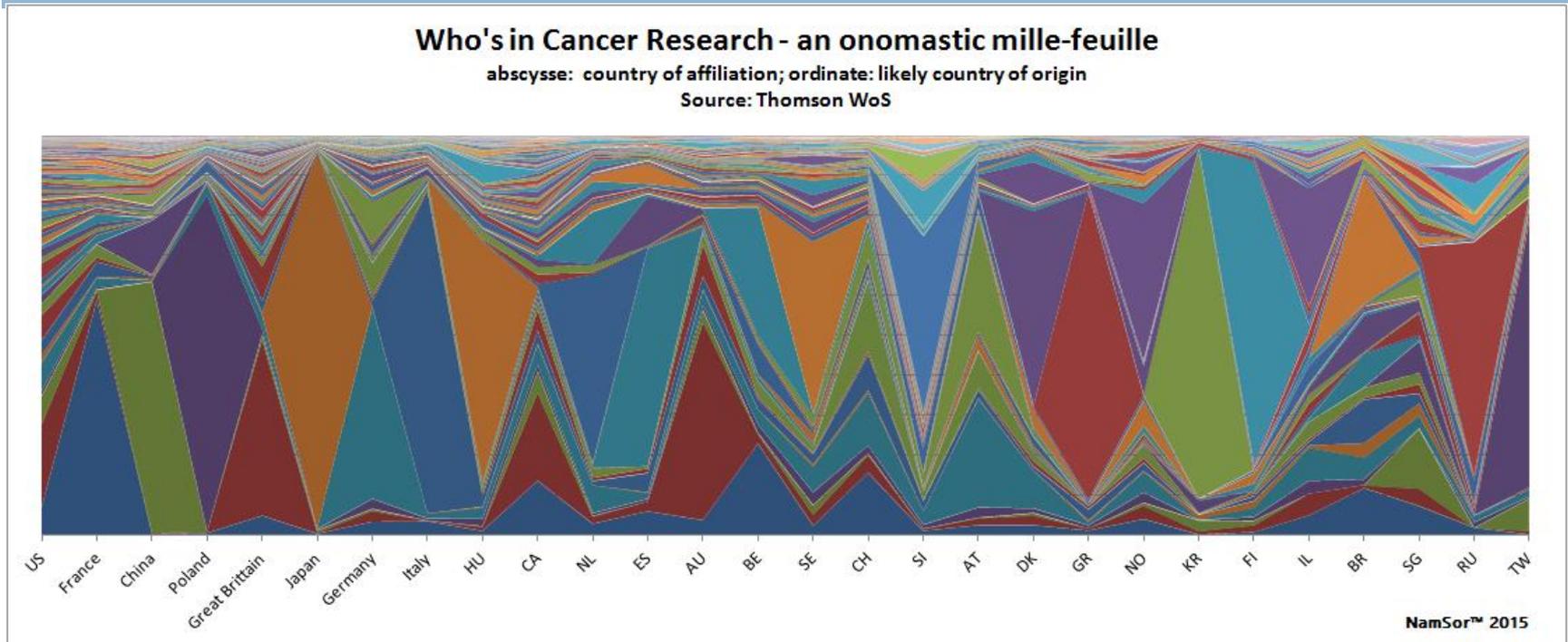


Source: Twitter
 Visualization : Gephi
 Data Mining: NamSor

Mapping Talents in Cancer Research

(in collaboration with French INSERM)

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Thomson Reuters WebOfScience (6 countries, 250k scientists, 50k papers)

“Analysts uncovered amazing patterns in the way scientists’ names correlate with whom they publish, and who they cite in their papers - not just in case of a particular country, but globally. Tania Vichnevskaja of the French National Institute for Health (INSERM) presented the paper ‘Applying onomastics to scientometrics’ at IREG International symposium 2015 organised by University of Maribor and Shanghai Jiao Tong University. The paper was prepared jointly with NamSor, a private start-up company specialized in mapping international Diasporas.”

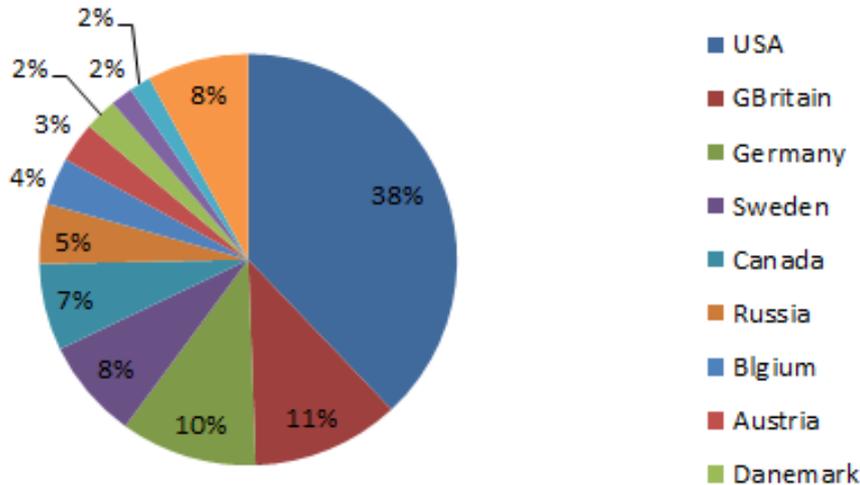
Source: WoS; Data Mining: INSERM with NamSor

Cancer Research in Poland and Slovenia

Examining the 'brain drain'

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The Polish "brain drain"

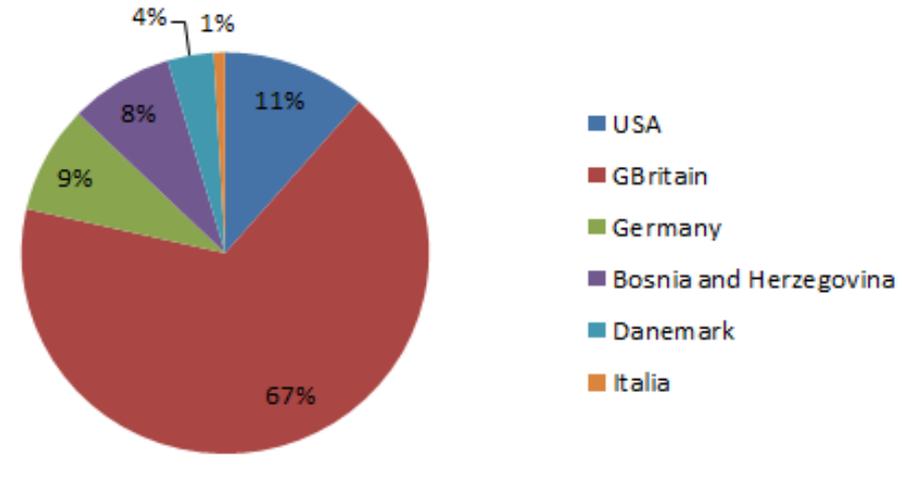


In the Polish Corpus, we look at co-authors with Polish names, affiliated abroad.

Top countries:

1. **US,**
2. **Great-Britain,**
3. **Germany.**

The Slovenien "brain drain"



In the Slovenian Corpus, we look at co-authors with Slovenian names, affiliated abroad.

Top countries:

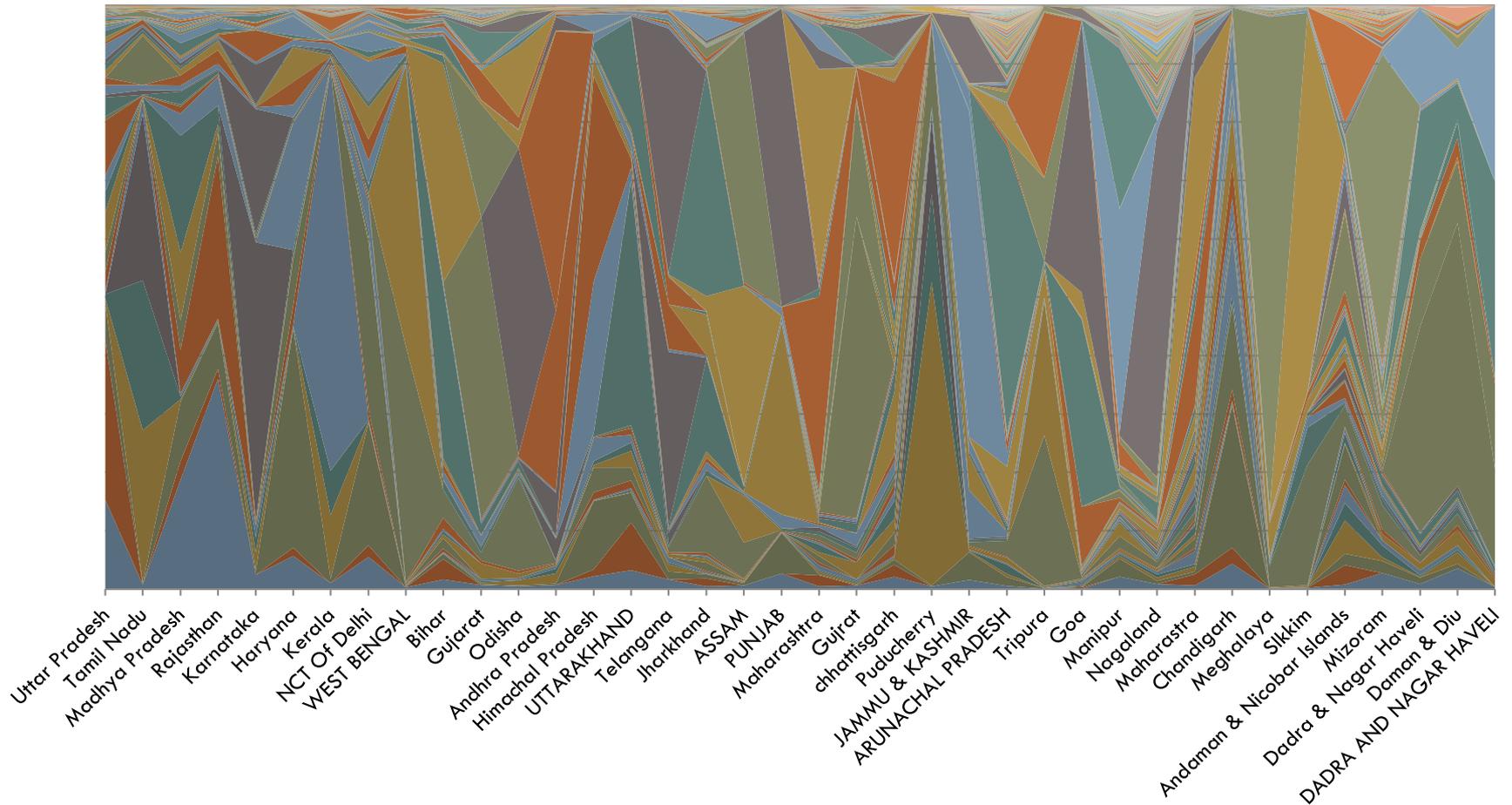
1. **Great-Britain,**
2. **US,**
3. **Germany.**

“Incredible India” – 1.2 BN People

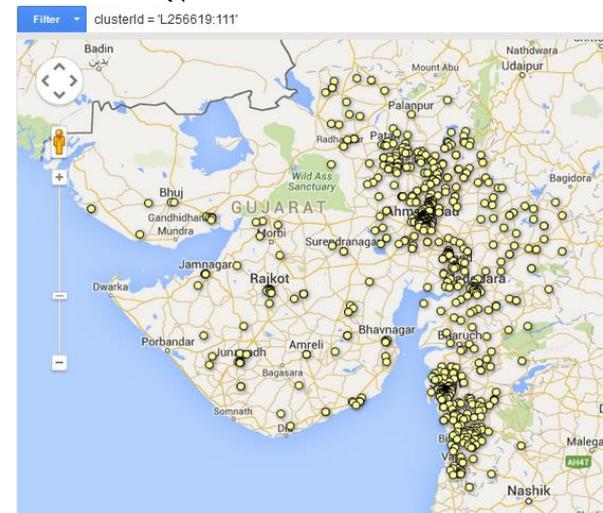
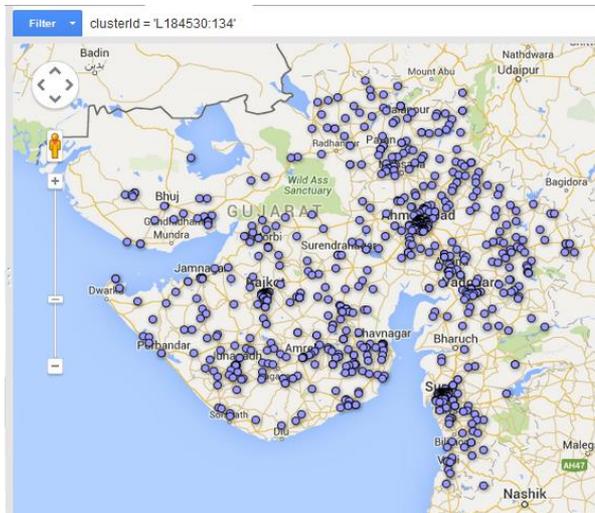
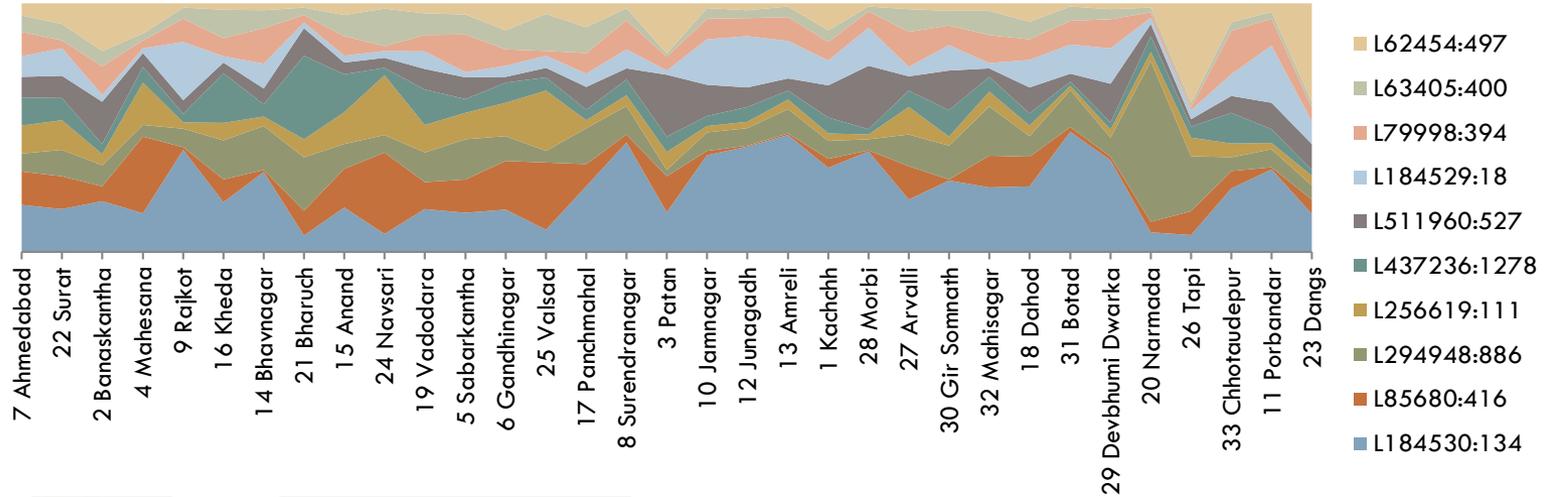
Indian onomastics by State/Union Territory

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Names in LATIN, BENGALI, DEVANAGARI, GUJARATI, GURMUKHI, KANNADA, MALAYALAM, ORIYA, TAMIL, TELUGU, ARABIC



GUJARAT : mapping onomastics by district

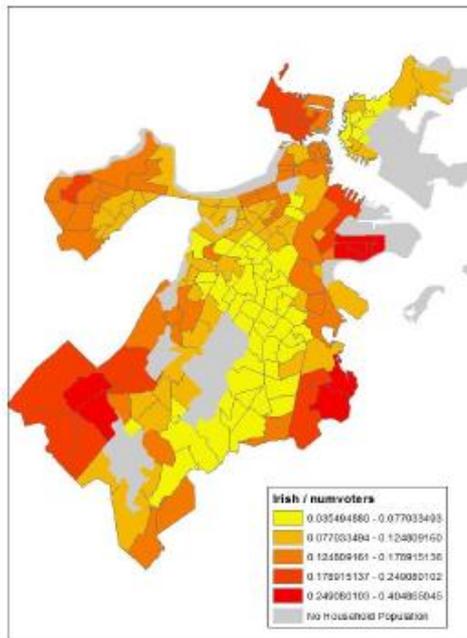


Source: Voters List; Visualization : Google Fusion Tables; Data Mining: NamSor

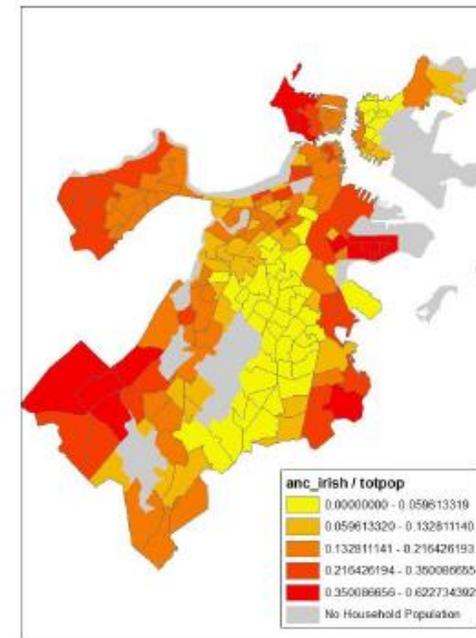
Boston geo-demographics 1/2

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Irish Share, namsor



Irish Share, 2010-2014 ACS



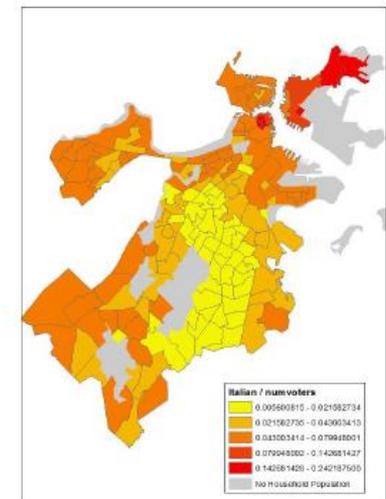
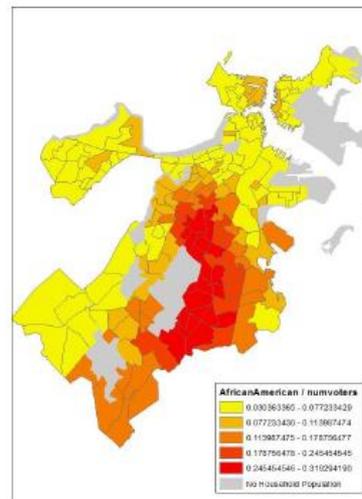
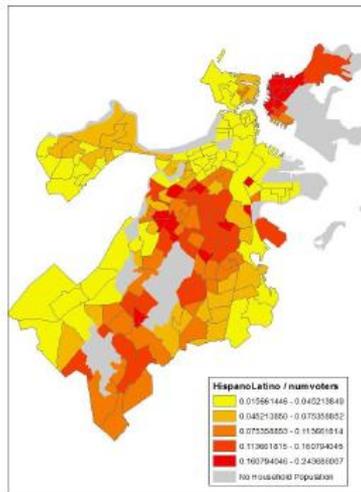
Boston geo-demographics 2/2



Hispanic/Latino Share, namsor

Black/African-American Share, nams

Italian Share, namsor



March 7, 2016
Presentation Title

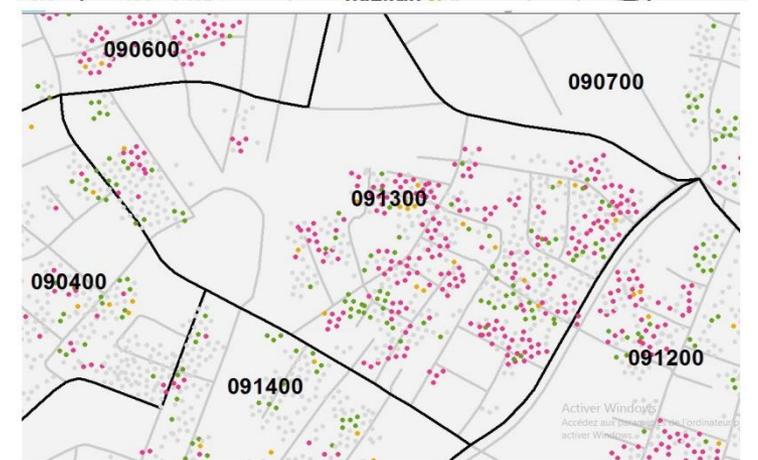
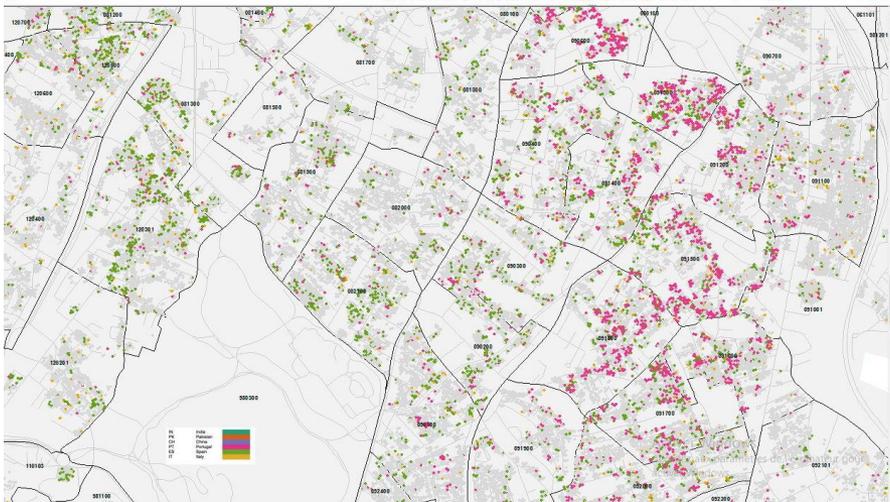
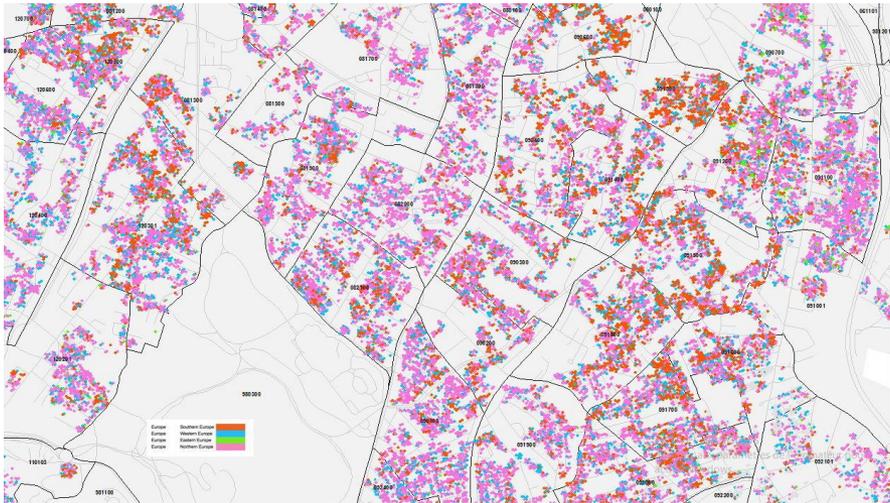
March 7, 2016
Presentation Title

March 7, 2016
Presentation Title

Source: Boston Voters List
Visualization : ESRI
Data Mining: NamSor

Breaking down 'White' and 'Asian' into Portuguese, Spanish, Italian, India, Pakistan, China, ...

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Source: Boston Voters List
Visualization : ESRI
Data Mining: NamSor

PATENT DATABASES

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ABOUT

The Demographics of Innovation in the United States

[Adams Nager](#), [David M. Hart](#), [Stephen Ezell](#), and [Robert D. Atkinson](#) February 24, 2016

A groundbreaking ITIF survey shows why the country needs to broaden and deepen its pool of potential innovators with better STEM immigration and education policies.

[View Report](#)

[View Executive Summary](#)

[Event](#)



Groundbreaking @ITIFdc survey shows why US needs to broaden and deepen pool of potential innovators



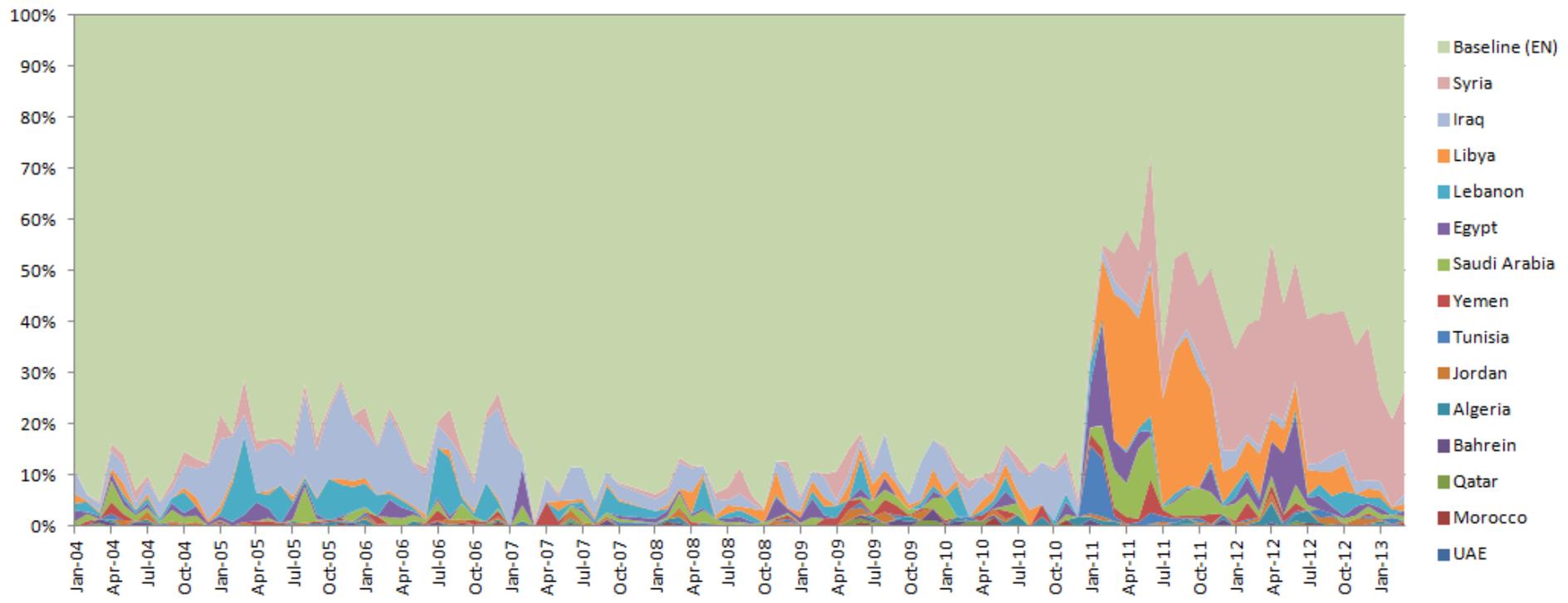
.@ITIFdc releases groundbreaking survey on who innovates in the United States and where and how it occurs

RUSSIAN MEDIA ANALYSIS

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EVOLUTION AND COMPARISON OF THE EXPOSURE OF ARAB PERSONALITIES IN RUSSIAN MEDIA

(Jan-2004 to Mar-2013, Source: Integrum WW/RussoScopie)



Source: Integrum/@RussoScopie

Indian diaspora names - a global airline use case

'For 93% of our customers, when NamSor recognizes an Indian name, the client has travelled to India in the past.'

At state level : ~50%

Analysis of NamSor's First Choice Country Compared to Historic Travel on [REDACTED]

NamSor's First Choice Country	Count of Unique Individuals who Have Travelled to NamSor's First Choice Country			% of Unique Individuals who Have Travelled to NamSor's First Choice Country		
	No	Yes	Grand Total	No	Yes	Grand Total
India	1,633	20,315	21,948	7%	93%	100%
Italy	281	869	1,150	24%	76%	100%
Bangladesh	524	1,456	1,980	26%	74%	100%
Ethiopia	3	8	11	27%	73%	100%
Iran	701	1,657	2,358	30%	70%	100%
Saudi Arabia	679	771	1,450	47%	53%	100%
Afghanistan	21	23	44	48%	52%	100%
Pakistan	2,171	2,309	4,480	48%	52%	100%
Jordan	148	124	272	54%	46%	100%
Kuwait	51	37	88	58%	42%	100%
Qatar	3	2	5	60%	40%	100%

Analysis of NamSor's Region Rounded Score Compared to Historic Travel on [REDACTED] for India

Customer has Flown to NamSor's Region	Count of Unique Individuals who Have Travelled to NamSor's Region			% of Unique Individuals who Have Travelled to NamSor's Region		
	No	Yes	Grand Total	No	Yes	Grand Total
5		3	3	0%	100%	100%
4	569	696	1,265	45%	55%	100%
3	2,202	2,774	4,976	44%	56%	100%
2	2,861	3,226	6,087	47%	53%	100%
1	2,442	2,523	4,965	49%	51%	100%
0	1,686	1,423	3,109	54%	46%	100%
-1	702	519	1,221	57%	43%	100%
-2	180	109	289	62%	38%	100%
-3	23	9	32	72%	28%	100%
-4	1		1	100%	0%	100%
Grand Total	10,666	11,282	21,948	49%	51%	100%

Indian diaspora in Mauritius

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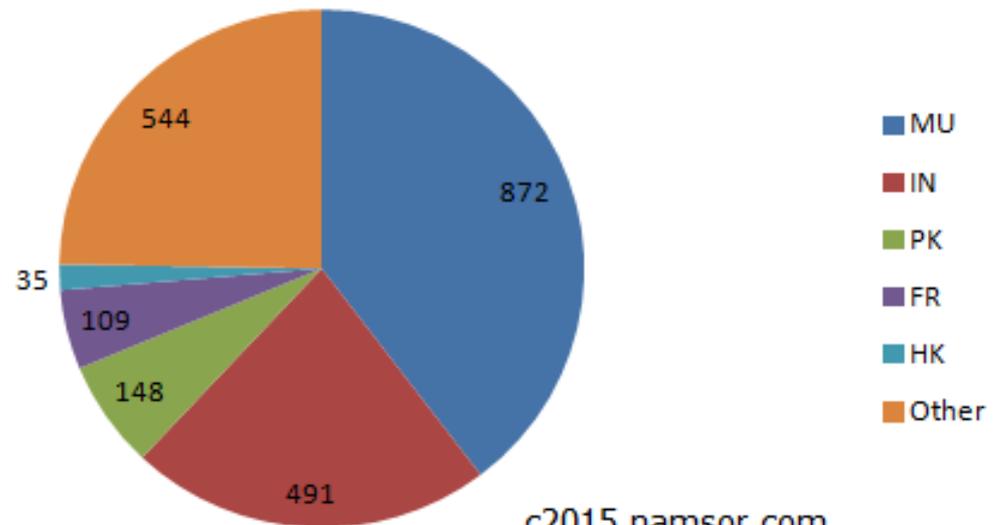
Registered Medical Practitioners

The annual list for the reg
category;

[Register of General Practitio](#)

Onomastics of ~2200 GPs in Mauritius

Using NamSor v0.0.27

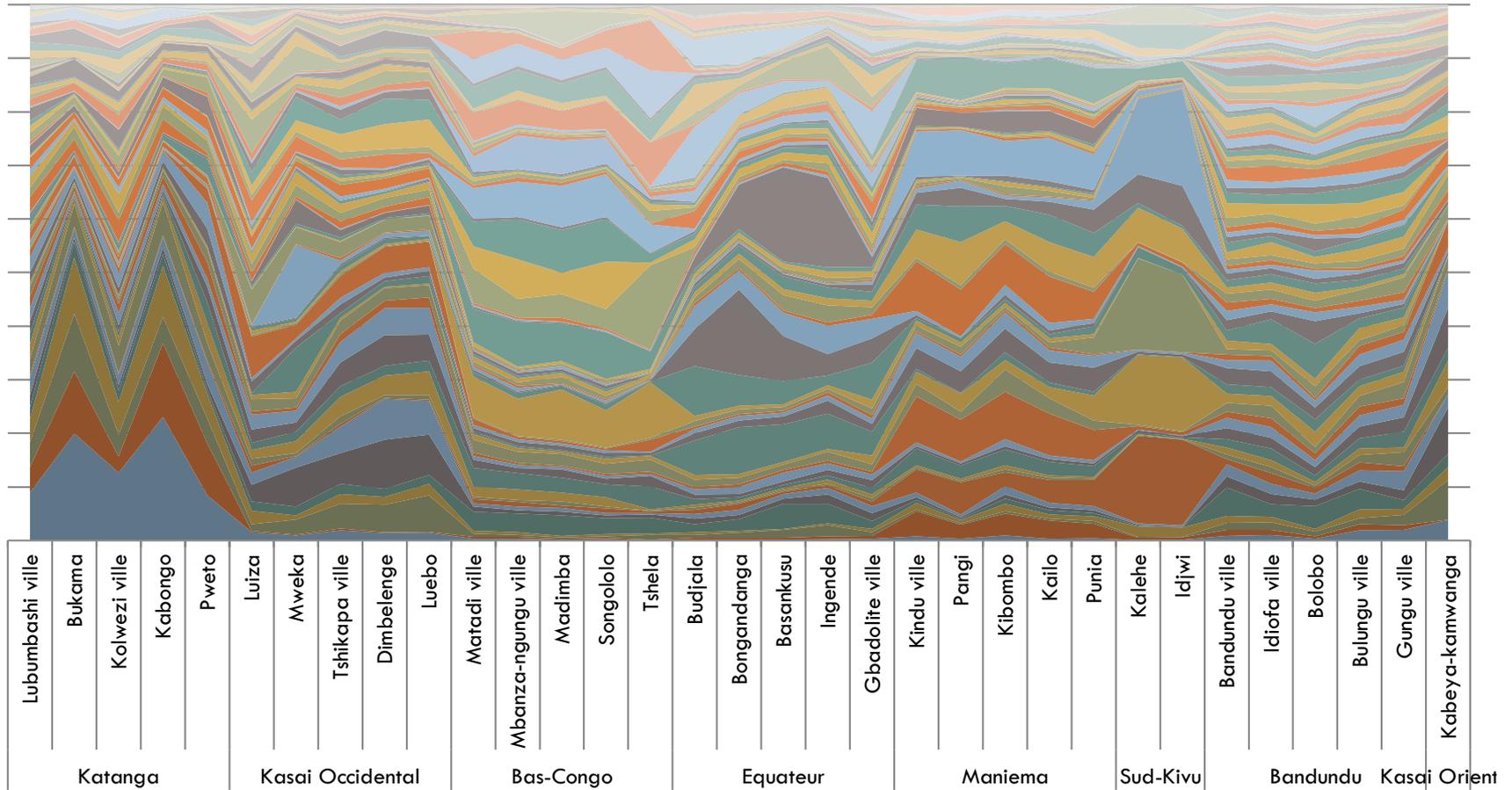


c2015 namsor.com

Source: medicalcouncilmu.org

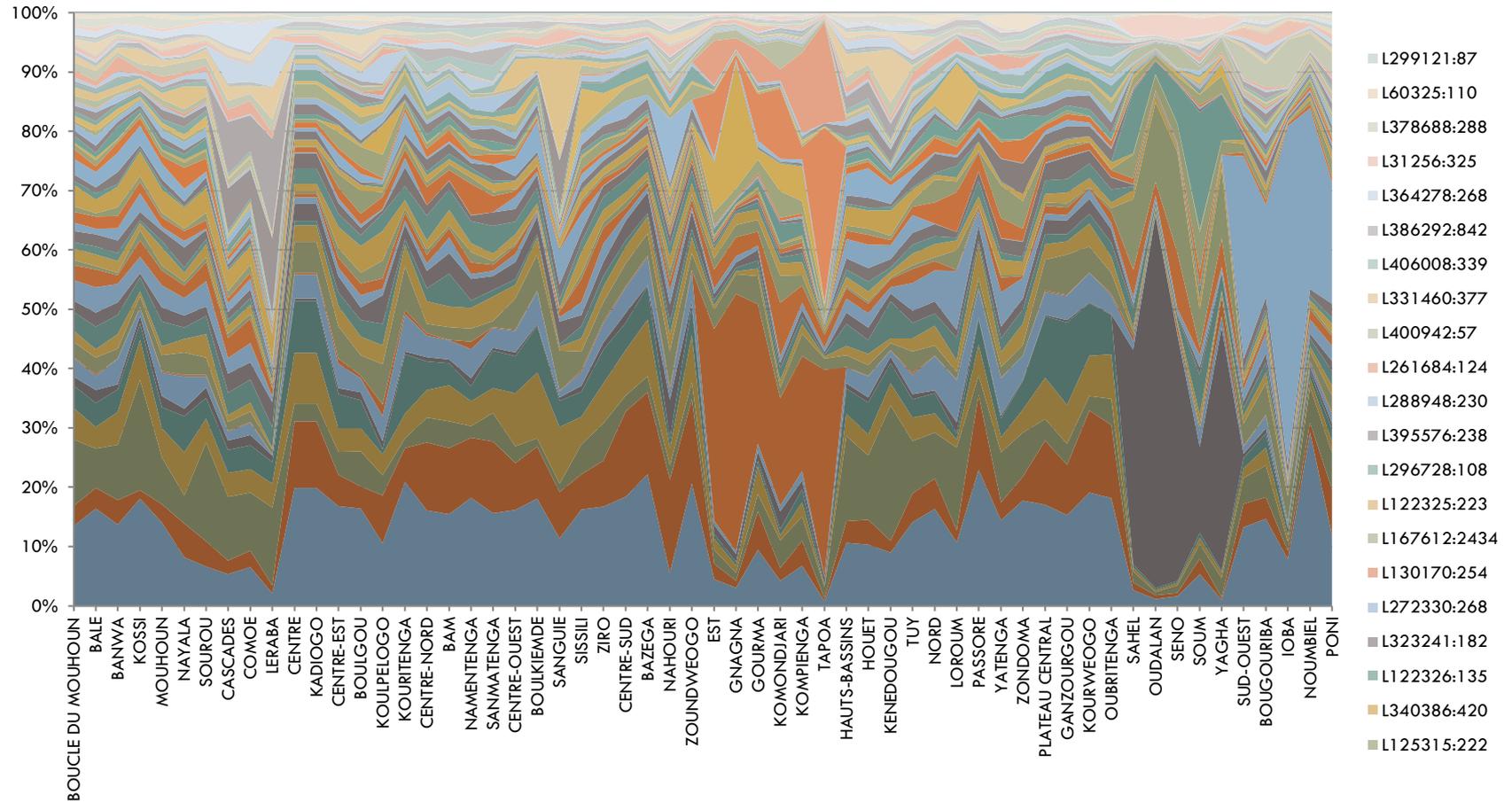
Africa: complex identities (Congo RDC)

34



Africa: complex identities (Burkina Faso)

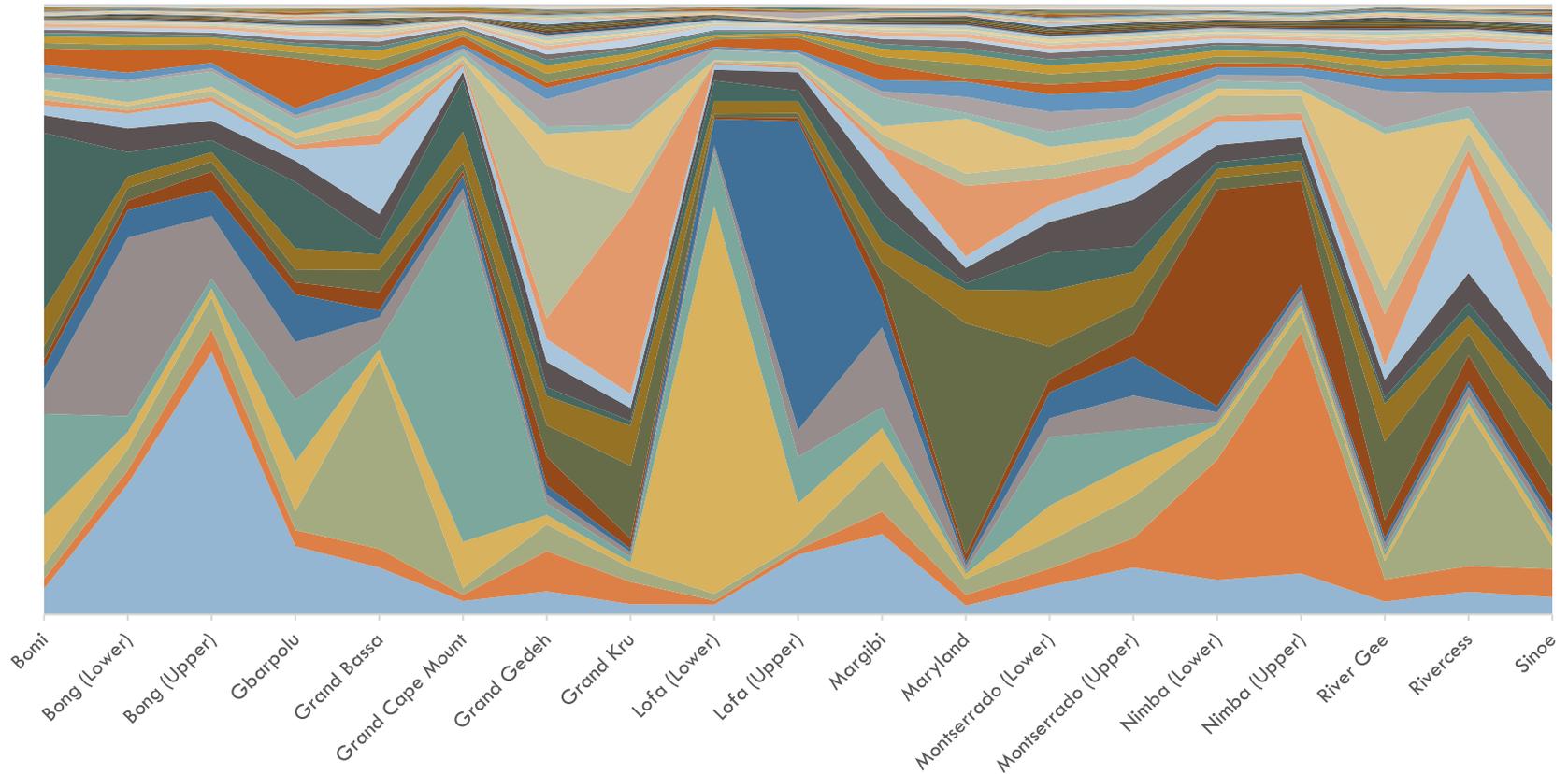
35



Africa: complex identities (Liberia)

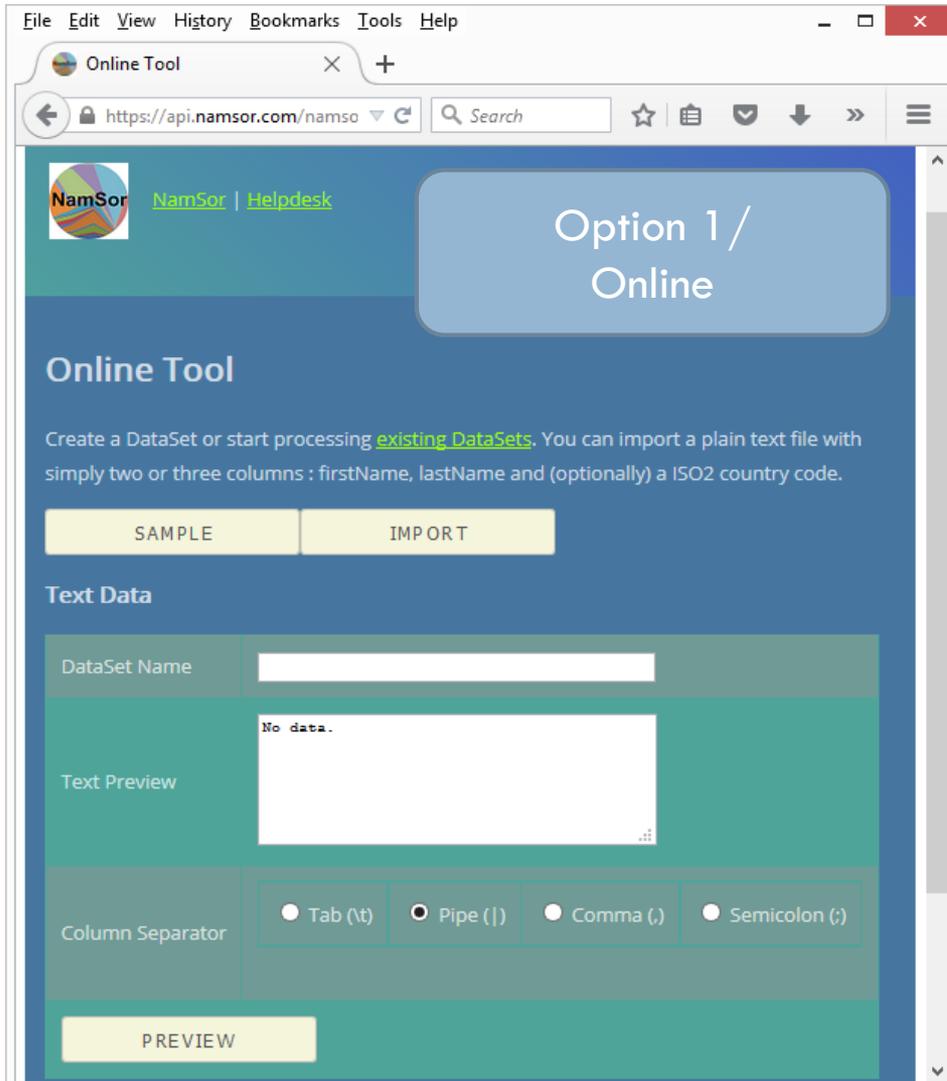
36

Liberia - a regional onomastics 'mille-feuille'

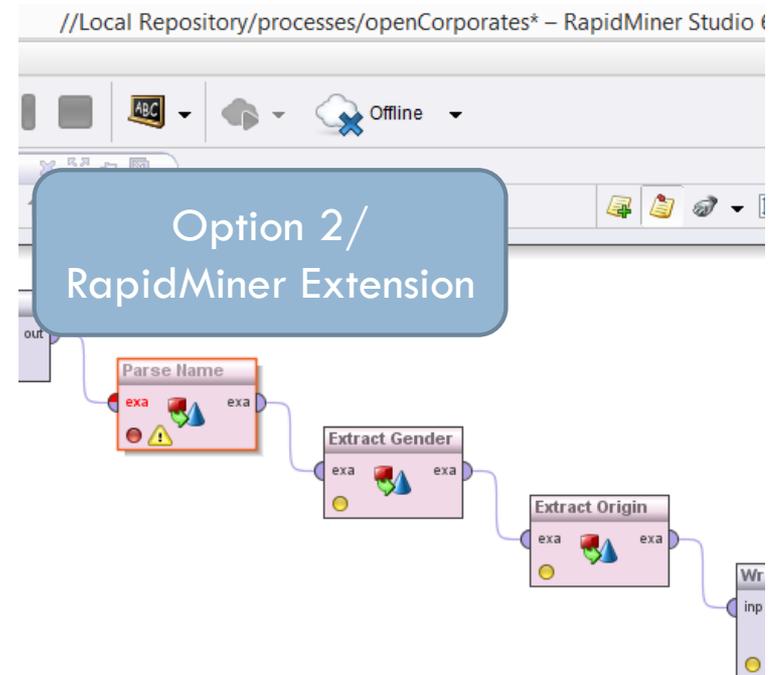


Using NamSor API

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The screenshot shows a web browser window with the URL `https://api.namsor.com/namsor`. The page title is "Online Tool" and it features the NamSor logo and a "Helpdesk" link. A blue callout box labeled "Option 1 / Online" is positioned over the top right of the page. The main content area is titled "Online Tool" and contains instructions: "Create a DataSet or start processing existing DataSets. You can import a plain text file with simply two or three columns : firstName, lastName and (optionally) a ISO2 country code." Below this are "SAMPLE" and "IMPORT" buttons. The "Text Data" section includes a "DataSet Name" input field, a "Text Preview" area showing "No data.", and a "Column Separator" section with radio buttons for "Tab (\t)", "Pipe (|)", "Comma (,)", and "Semicolon (;)". A "PREVIEW" button is at the bottom.



Option 3 /
NamSor API & SDK

Thank you !

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elian.carsenat@namsor.com

Phone : +33 6 52 77 99 07

