

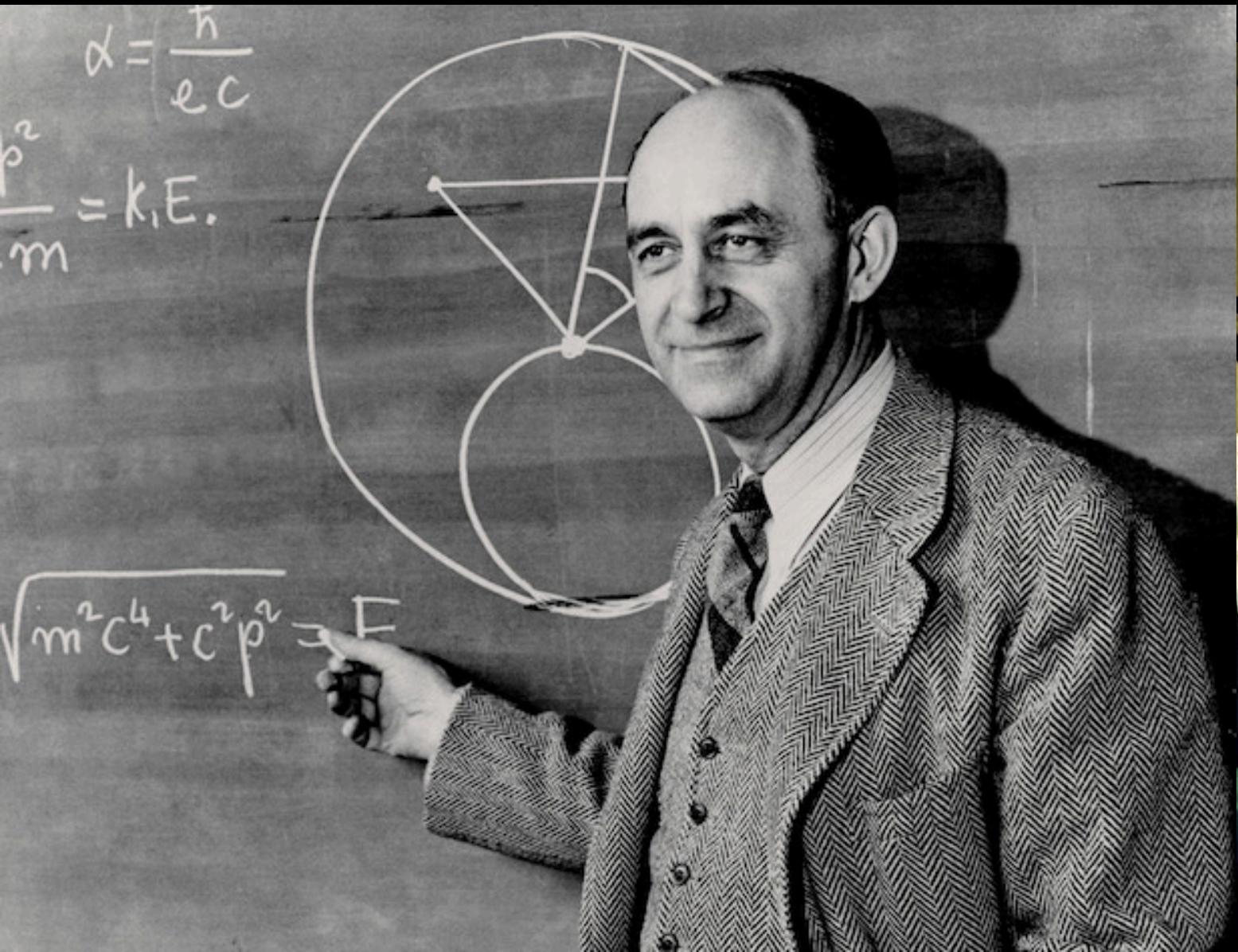
Vattay Gábor ELTE Komplex Rendszerek Fizikája Tanszék

# Szociális hálózatok, virális videók, meg minden ...

# Akik nélkül ez az atomcsill nem lett volna:

- Csabai István professzor KRFT
- Dobos László adjunktus KRFT
- Stéger József adjunktus KRFT
- Kondor Dániel postdoc MIT Senseable City Lab
- Bokányi Eszter doktorandusz KRFT
- Kallus Zsófia doktorjelölt Ericsson Traffic Lab
- Szüle János doktorandusz Ericsson
- Sebők Tamás doktorandusz Ericsson
- Barankai Norbert doktorjelölt ELTE Kármán Lab

**"Physics is what physicists do late at night."**



# a SZOCIOLÓGIA mint TERMÉSZETTUDOMÁNY

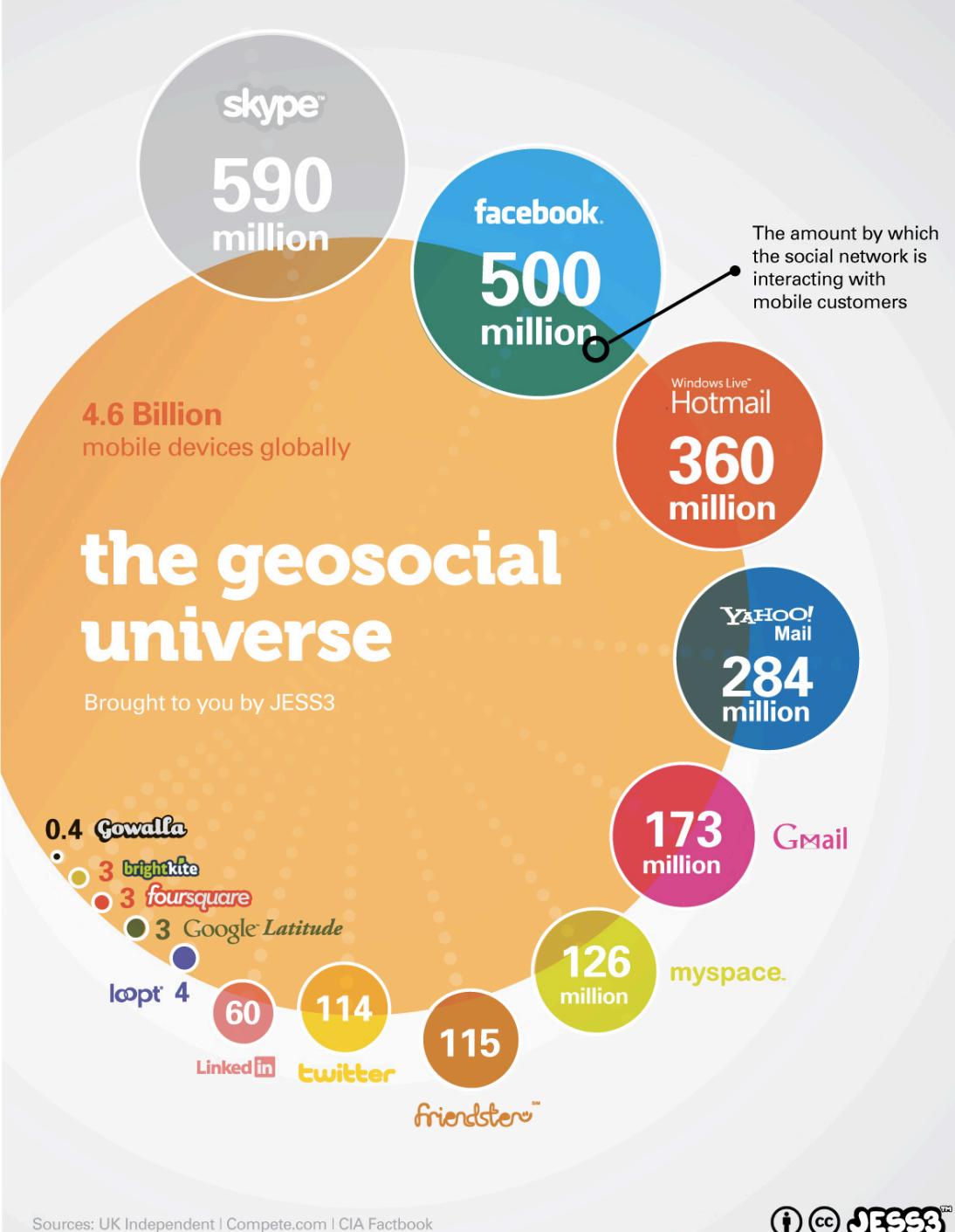


# a SZOCIOLÓGIA mint TERMÉSZETTUDOMÁNY



# a SZOCIOLÓGIA mint TERMÉSZETTUDOMÁNY

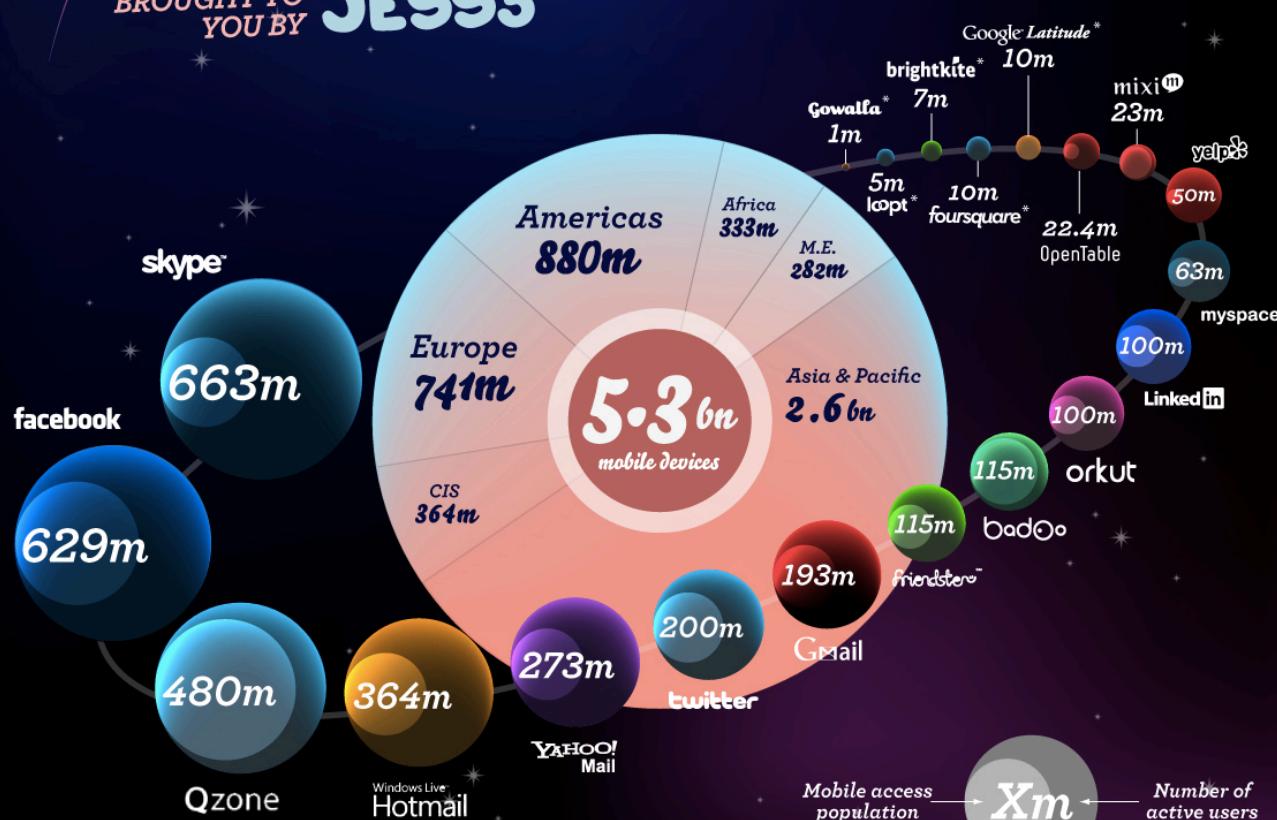




4.6 milliárd

# THE Geosocial universe

BROUGHT TO YOU BY JESS3



Remember when Friendster dominated the U.S. social space? Like the universe, the geosocial landscape is constantly changing. While new stars are being born, black holes are also developing.

We looked at the current size of the major social networks and overlaid their current mobile user base.

2011

5.3  
milliárd



Sources: TechCrunch | SocialMediaToday | Facebook | Wikipedia | Mashable | GeekoSystem | Daily Mail | LinkedIn | Loop | SearchEngineLand | Brightkite | SocialTimes | Badoo | MobiThinking

\* 100% mobile access

May 2011

## GEOSOCIAL UNIVERSE 3.0

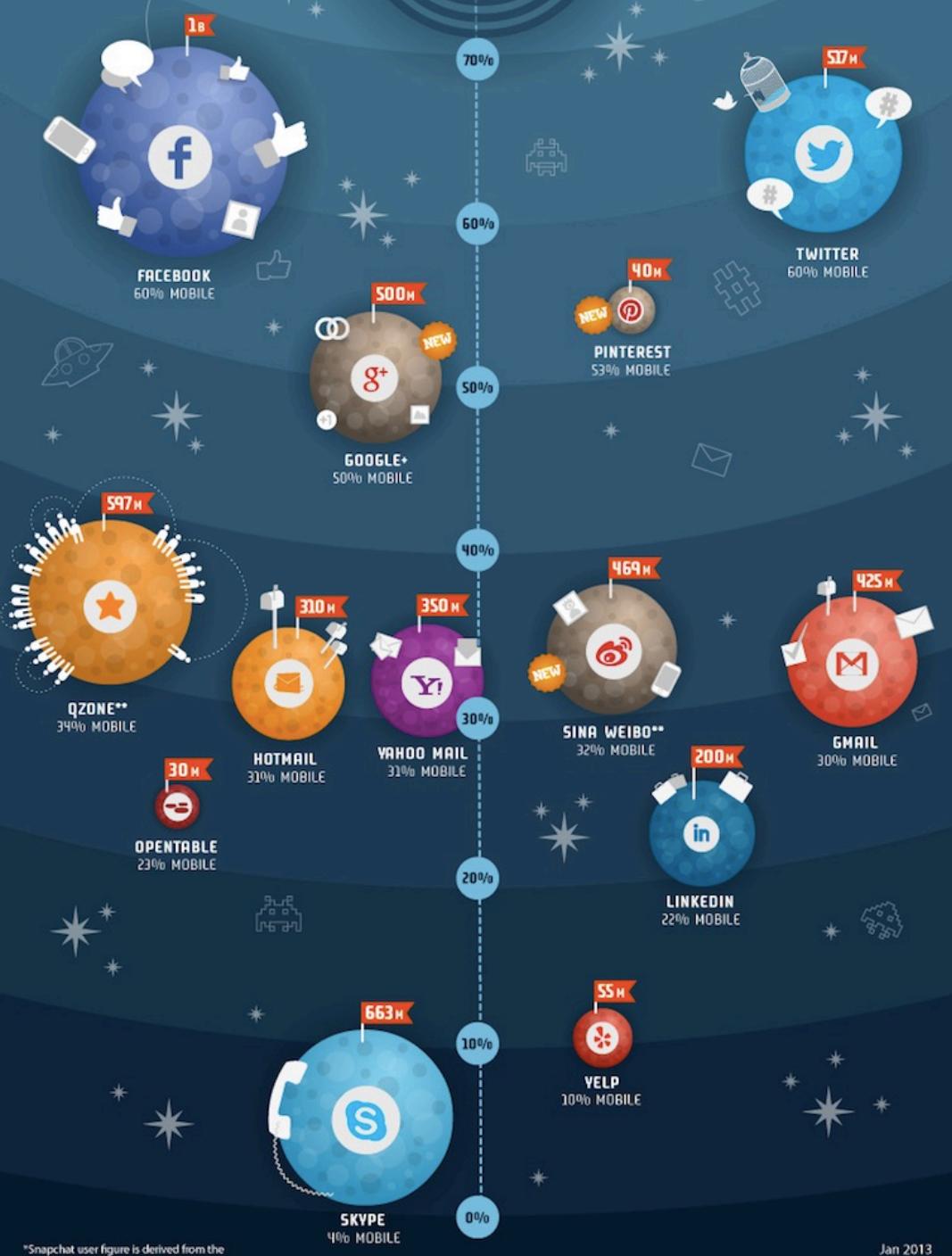
In today's Geosocial Universe, the supernova of mobile is orbited by practically every celestial body online like Facebook, with its 1 billion users, to the meteorically-rising Instagram, which shot to 100 million users in under 2 years on a 100% mobile platform.

With this third edition of this infographic, we check in with the worlds that keep turning, say goodbye to those that slipped into the black hole of obsolescence, and greet the burgeoning stars that make the Geosocial Universe an ever-expanding one.



# 2013

# 5.98 milliárd



2013

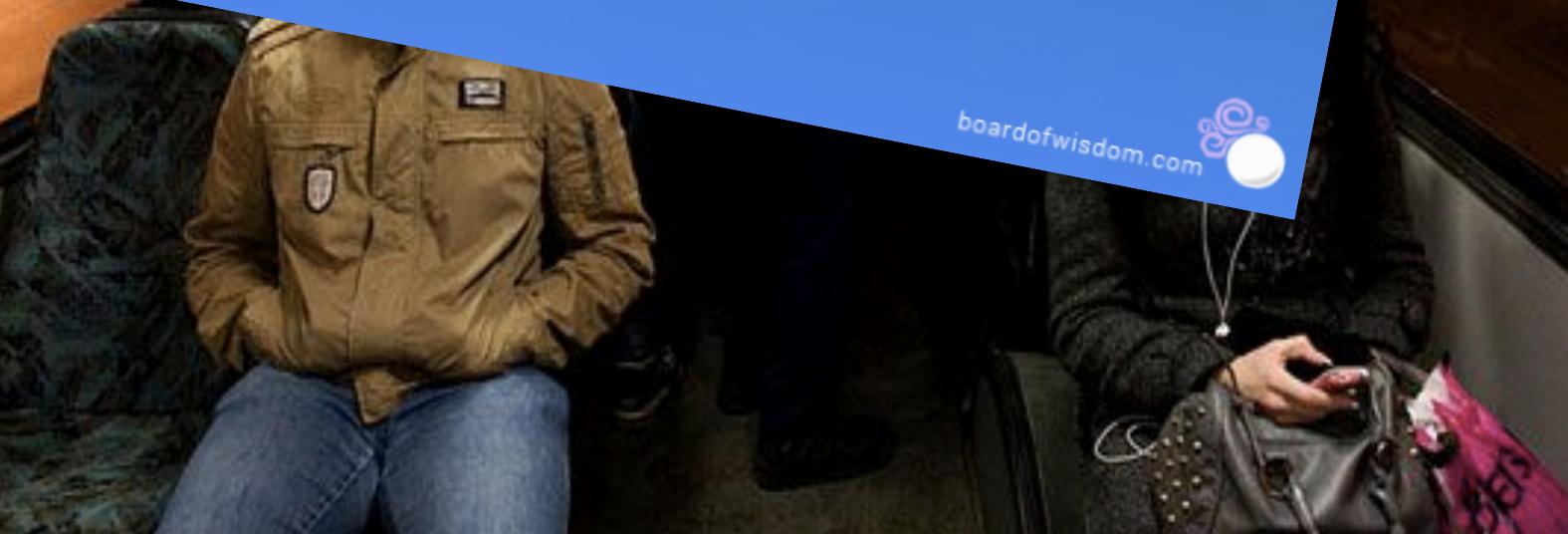
5.98 milliárd

1132  
1135

*Facebook is where you lie to  
your friends. Twitter is  
where you're honest with  
complete strangers.*

- Unknown

boardofwisdom.com



# KEY TWITTER STATS

**Registered Users  
316 Million**



**Mobile Users  
80%**

**Tweets per Day  
500 Million**

KATY PERRY (@katyperry) | Tw X

Twitter, Inc. [US] | https://twitter.com/katyperry

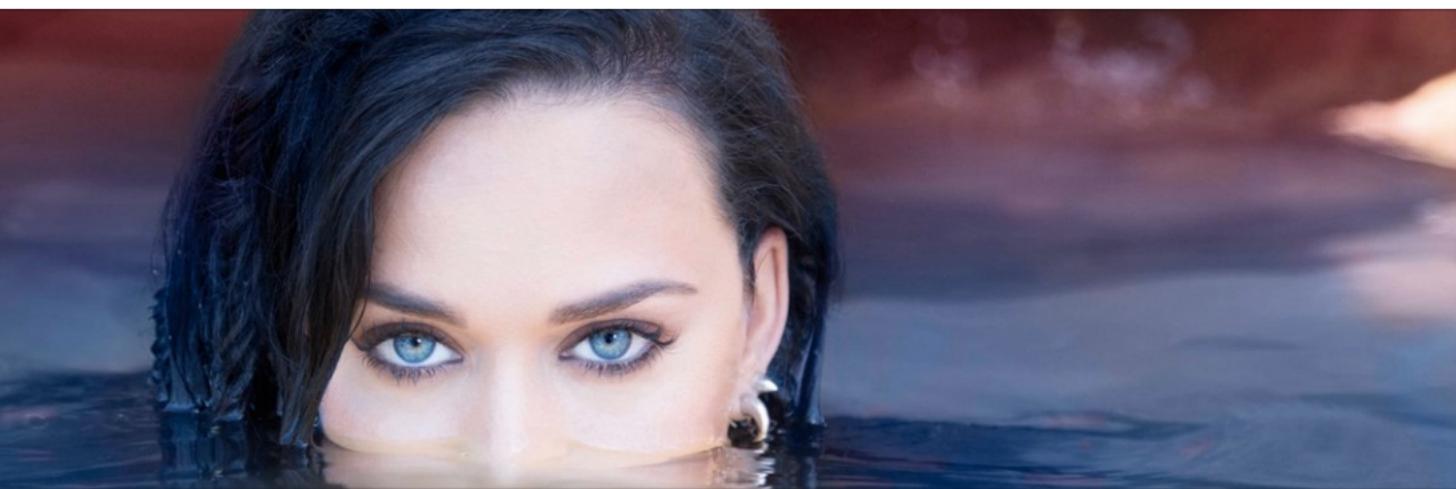
Apps M Sci-Hub: removing... ★ Bookmarks FBK | Center for Inf... Tommaso Calarco -... Ketogenic Diet Res... Családkutatás Budapesti lakcímje... j tutorials

Other Bookmarks

Home Notifications Messages

Search Twitter

Gábor



Rise

TWEETS 7,256 FOLLOWING 166 FOLLOWERS 92.9M LIKES 2,669

[Follow](#)

**KATY PERRY** 

@katyperry

Rising...

[smarturl.it/KatyRise](http://smarturl.it/KatyRise)

Joined February 2009

[Tweet to KATY PERRY](#)

11 Followers you know



Pinned Tweet

**KATY PERRY** @katyperry · Aug 5

Through the blood, sweat (lots of it), and tears, we keep rising 💪 Finally, my new video for #RISE:



**Rise - Katy Perry**  
Watch music videos and original shows on Vevo.  
Download Vevo free on mobile and TV devices.  
[vevo.com](http://vevo.com)

Who to follow · Refresh · View all

**Kourtney Kardashian**  [Follow](#)

**Khloé**  @khloekardashian [Follow](#)

**Tabitha Bliss**  @BlissTa... [Follow](#)

Find friends

**TRUMP  
PENCE**  
MAKE AMERICA GREAT AGAIN!

Republican Nominees,  
Donald J. Trump  
& Michael R. Pence

**Donald J. Trump**

@realDonaldTrump

New York, NY

DonaldJTrump.com

Joined March 2009

TWEETS 33.2K FOLLOWING 42 FOLLOWERS 11.6M LIKES 39

[Following](#)

[Tweet to Donald J. Trump](#)

17 Followers you know

**Tweets**   [Tweets & replies](#)   [Media](#)

Donald J. Trump @realDonaldTrump · 2h  
It is a MOVEMENT - not a campaign. Leaving the past behind, changing our future. Together, we will MAKE AMERICA SAFE AND GREAT AGAIN!

**Who to follow** · Refresh · View all

BeCube @becubeSuli  
[Follow](#)

, Linda Suhler, Ph.D. @Linda...  
[Follow](#)

, Donald Trump Jr. @Don...  
[Follow](#)

Find friends

CERN (@CERN) | Twitter

Twitter, Inc. [US] https://twitter.com/CERN

Apps Sci-Hub: removing... Bookmarks FBK | Center for Inf... Tommaso Calarco ... Ketogenic Diet Res... Családkutatás Budapesti Iakcímje... tutorials

Gábor

Home Notifications Messages

Search Twitter

Tweet

**CERN**

@CERN

CERN, the European Organization for Nuclear Research, is the world's largest particle physics lab and has #RestartLHC for #13TeV collisions. French: @CERN\_FR

Geneva home.cern Joined June 2008

**TWEETS 2,522 FOLLOWING 378 FOLLOWERS 1.52M LIKES 108 LISTS 6**

**Following**

**Tweets** Tweets & replies Media

**CERN @CERN · 6h**

Successful global #openaccess Initiative, SCOAP3, continues for another 3 years [home.cern/about/updates/ ...](http://home.cern/about/updates/)

CERNpress

**Who to follow** · Refresh · View all

**Omri Har-Shemesh** @omrihar Followed by Complexity Dig...

**Burcu Yucesoy** @Karhe Followed by baruch barzel a...

**Domonkos Tikk** @domonko... Followed by Jozsef J. Biro a...

Find friends

**Tweet to CERN**

# Adatbázisunk 2012-2014

4.0 Billion tweets

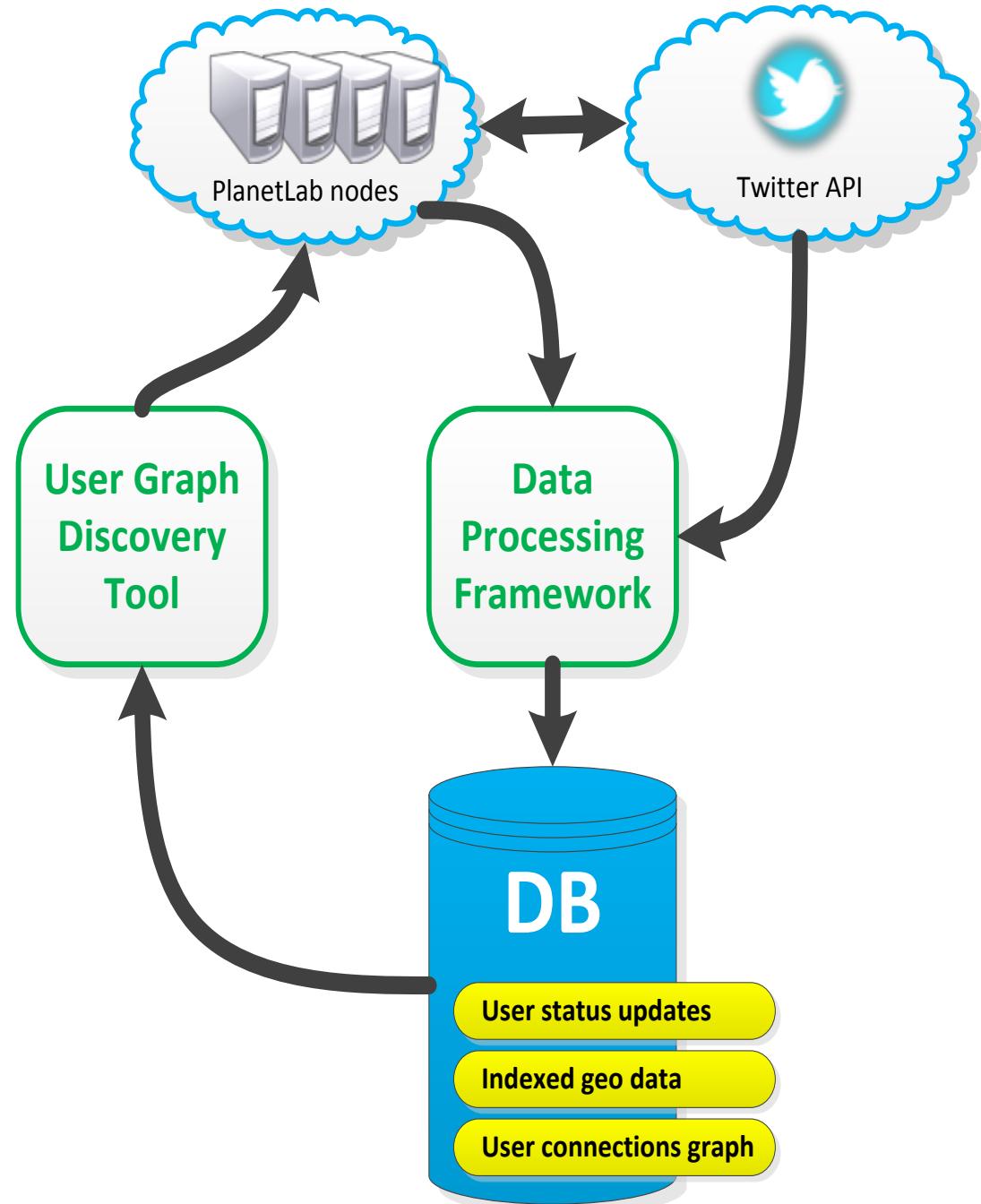
1.6 Billion GPS

130 Million users

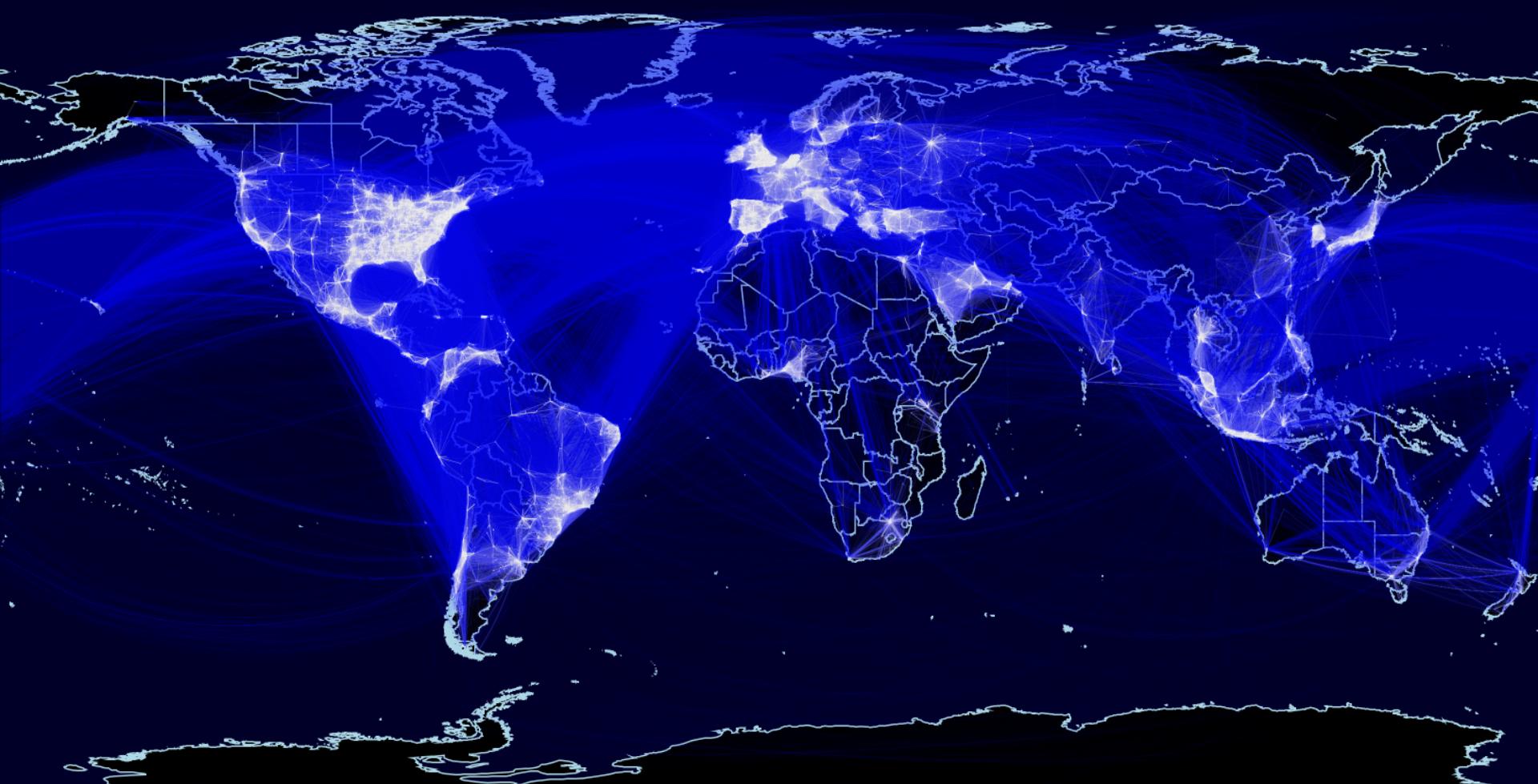
**Twitter barátság**

Top 6 Million GPS

122 Million  
Friendships



# Twitter barátság hálózatunk @elte

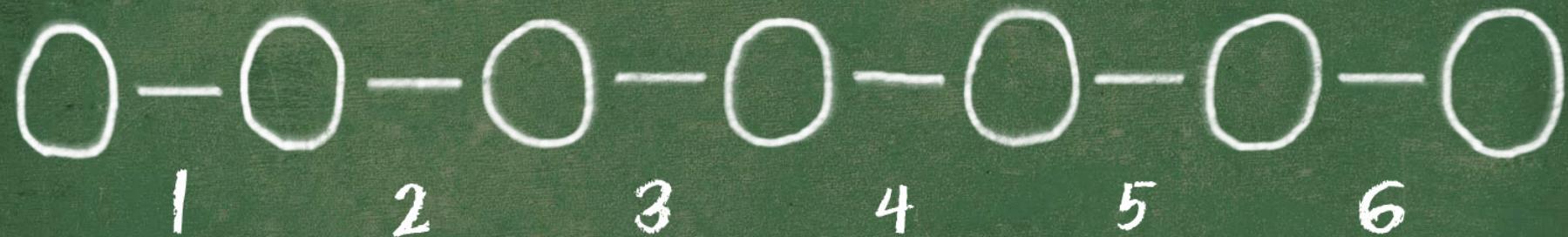


# KÍSÉRLETEK

You



Random  
Person



degrees of separation

# Milgram kis világ kísérlete (1967)



## Lost in the City: Revisiting Milgram's Experiment in the Age of Social Networks

János Szüle Dániel Kondor, László Dobos, István Csabai, Gábor Vattay

Published: November 10, 2014 • DOI: 10.1371/journal.pone.0111973

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# Sur Twitter, la théorie des «six degrés de séparation» ne fonctionne pas



UN VENT NOUVEAU SUR L'INFO

Vendredi 05 Décembre

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Strangers in the night

Publié le 25 Novembre 2014

## Quand Twitter prouve que la théorie des 6 degrés de séparation



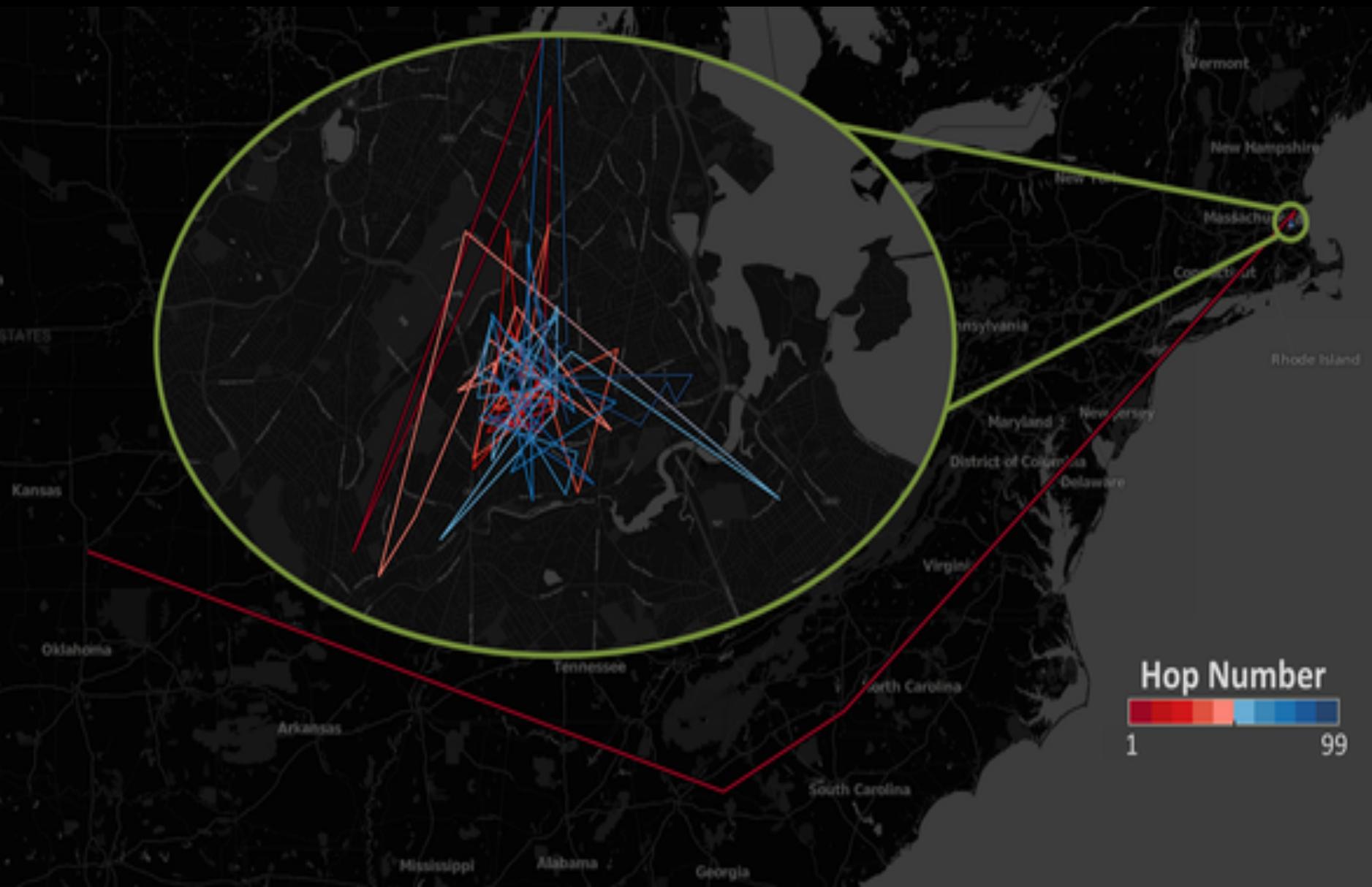

COMMUTE WORK HOUSING WEATHER CRIME POLITICS DESIGN TECH

## Why 'Six Degrees of Separation' Breaks Down Inside Cities

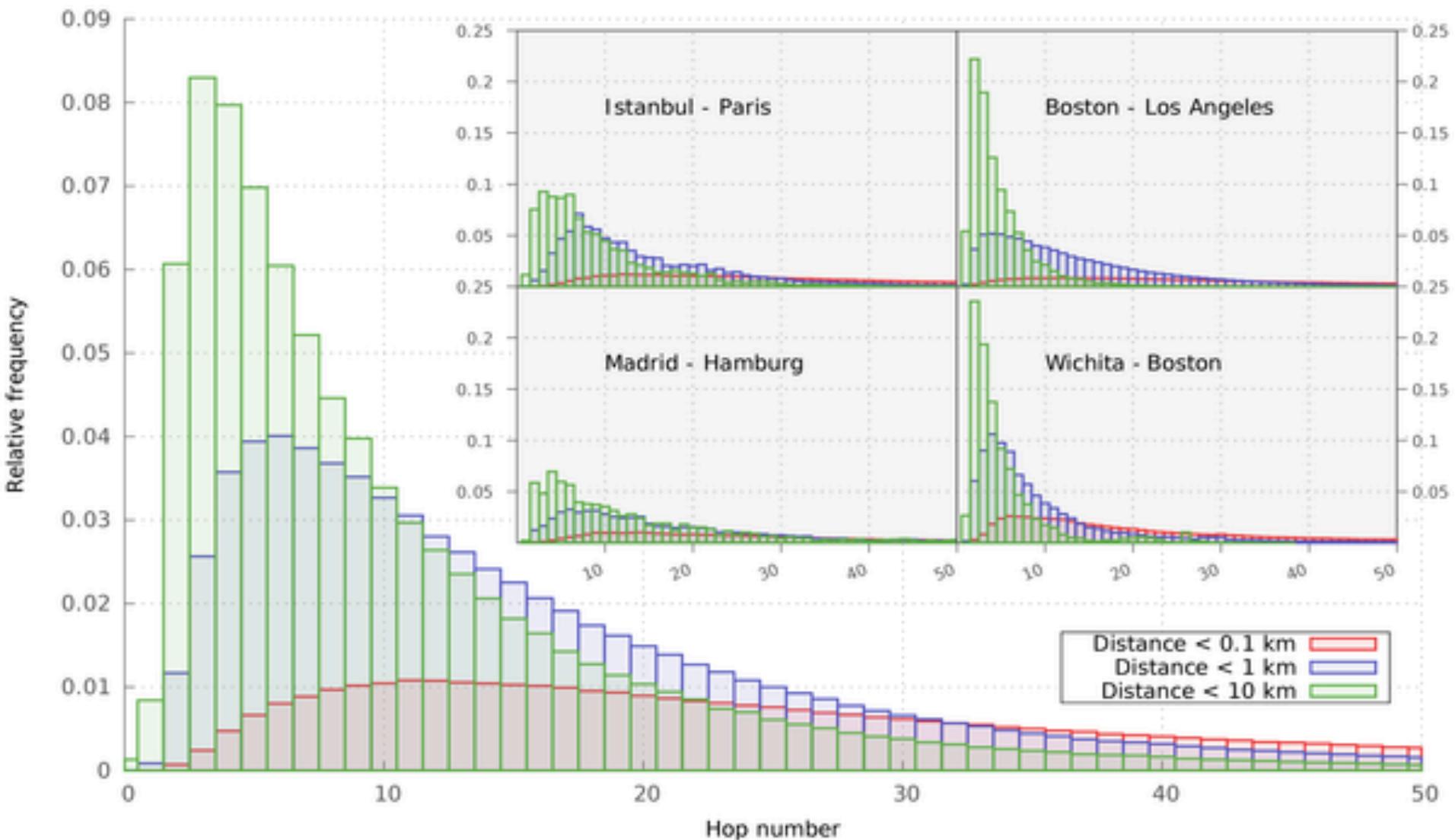
Inspired by Milgram's famous experiment, an analysis of Twitter networks and geography reveals how personal connections get lost at the city level.

Laura Blagg | @malvazurblagg | Nov 12, 2014 |

# A twitter barátság hálózaton megismételt kísérlet



# Hány lépésre van szükség a cél megközelítéséhez?



A fizikai front modellek használata a virális videók terjedésére

# **TERJEDÉSI JELENSÉGEK**



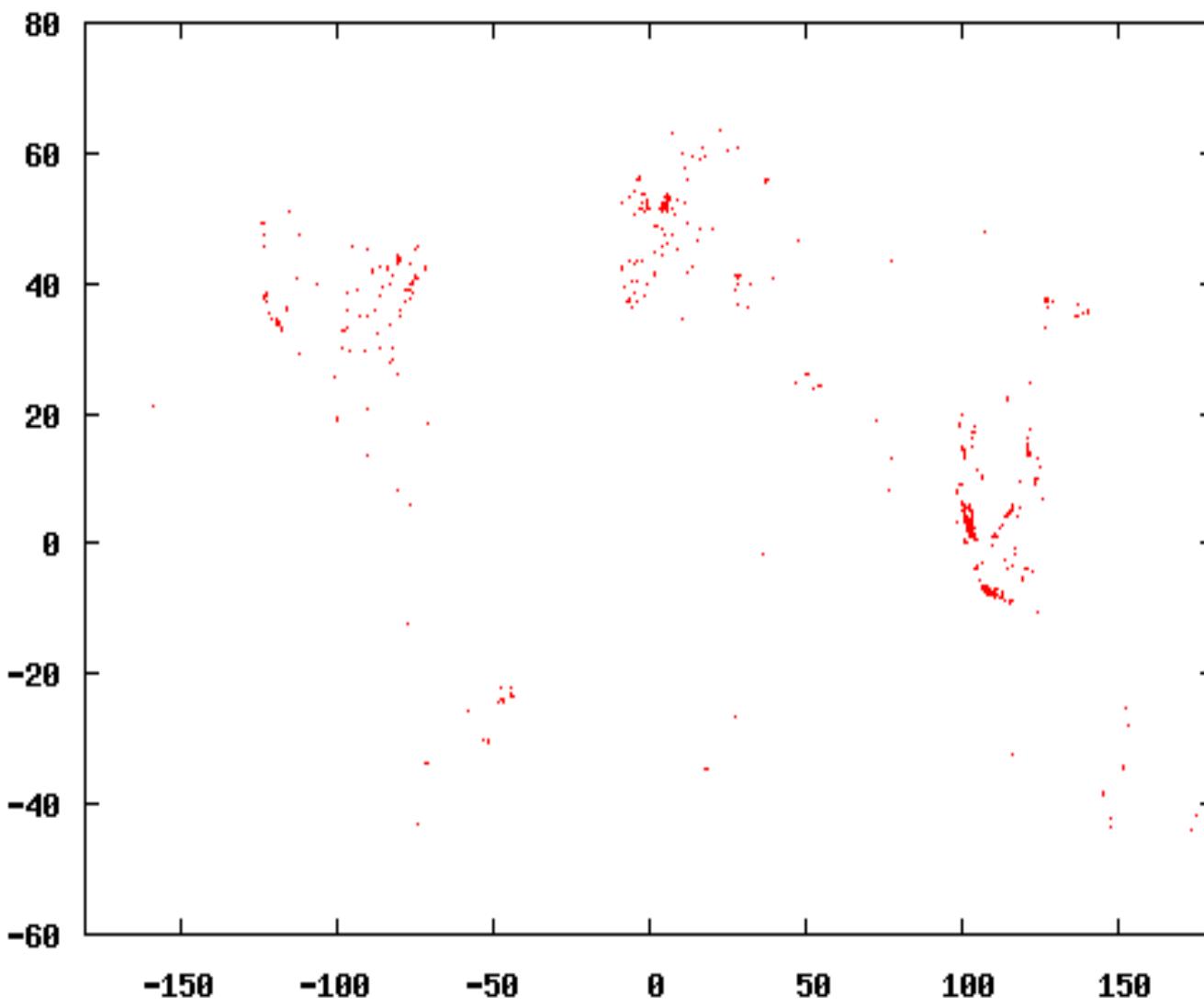


2012 július 15

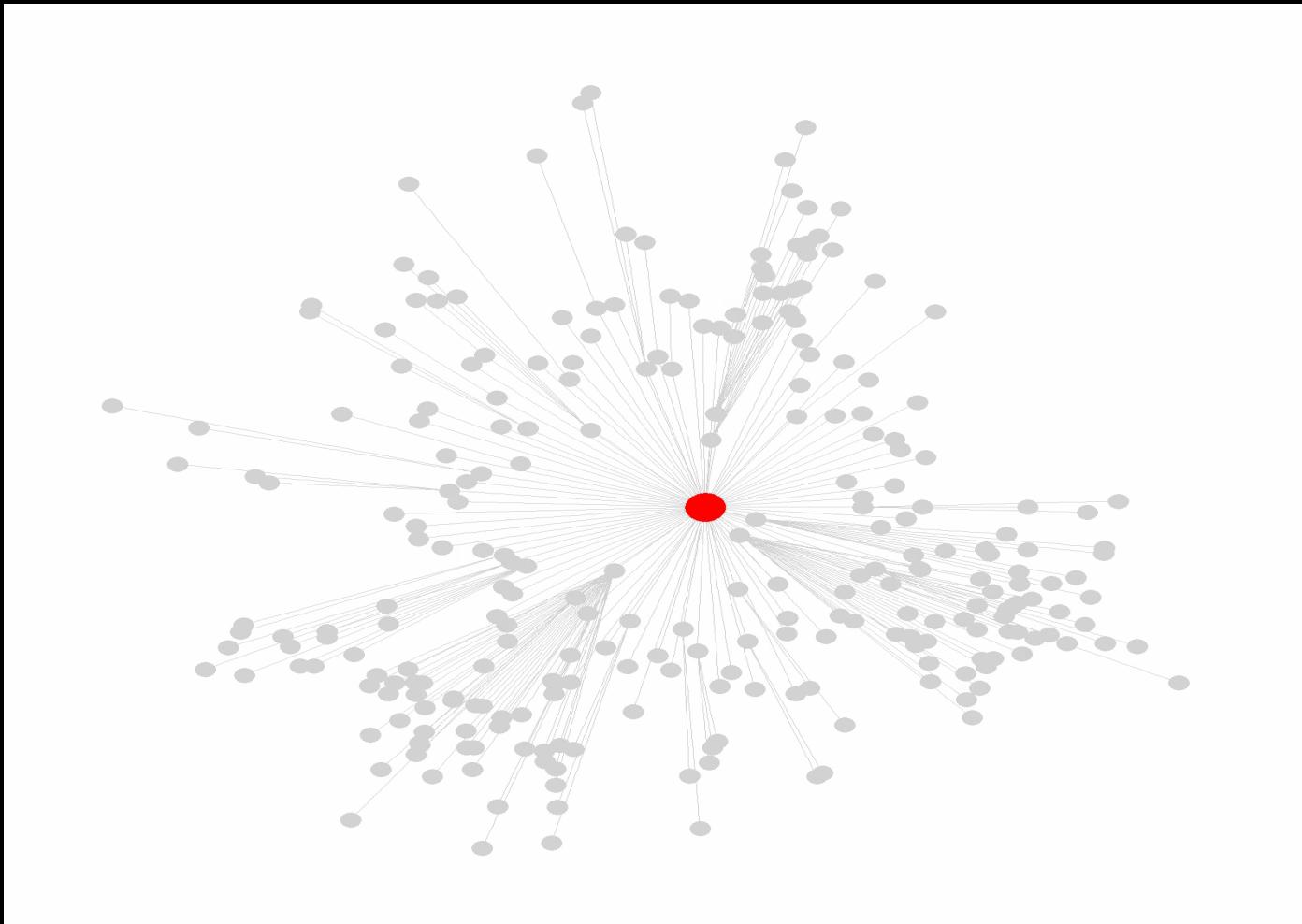




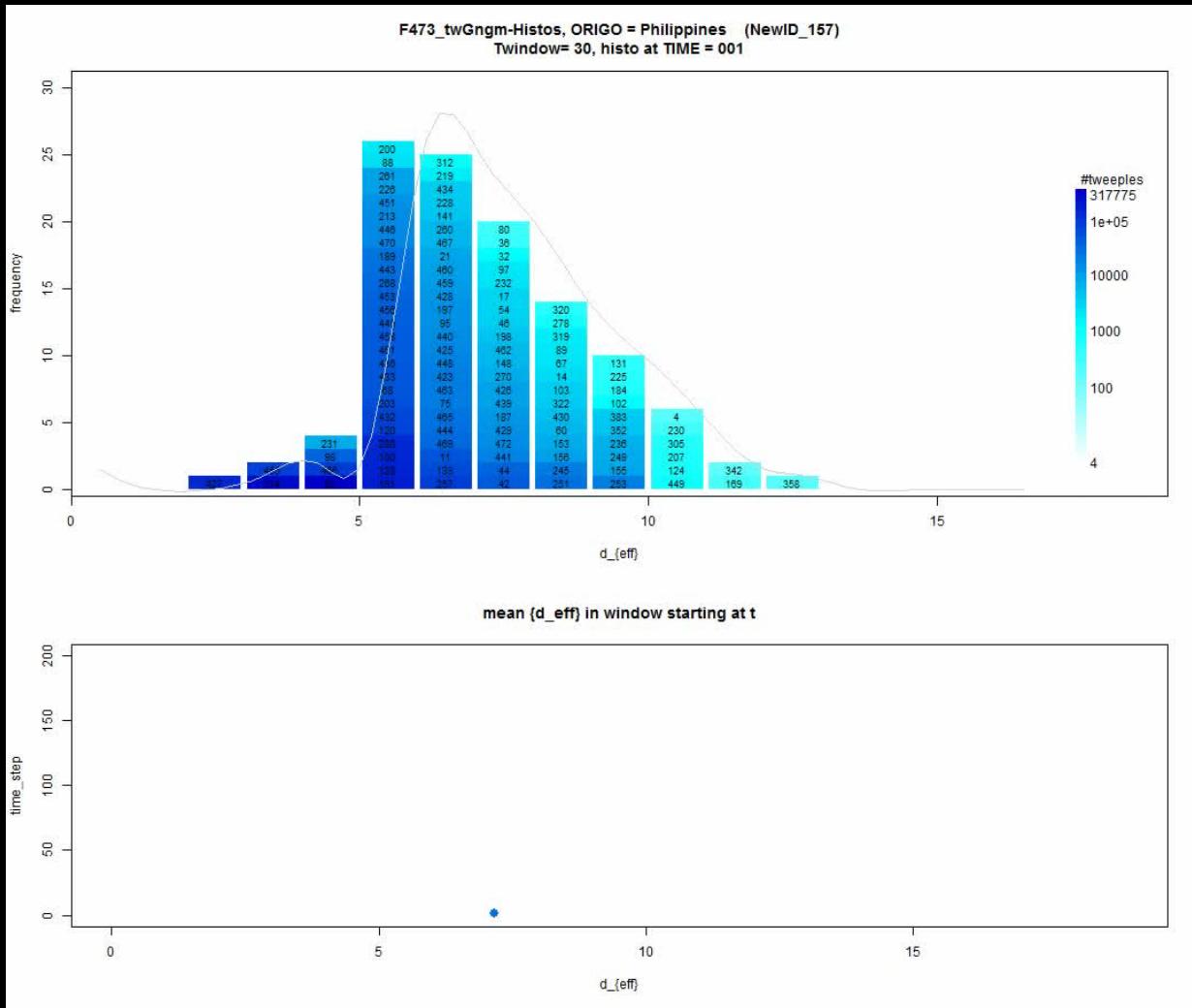
# A Gangnam pandémia



# Gangnam terjedés a Twitteren



# Gangnam terjedés a Twitteren

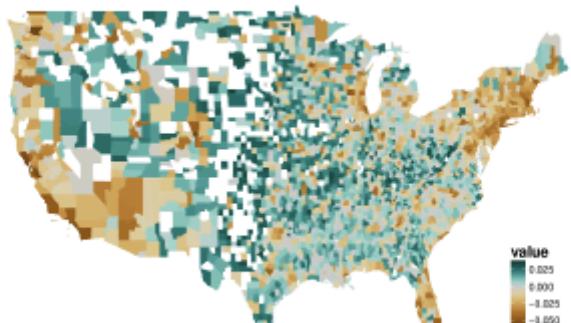


# **MIRŐL BESZÉLNEK AZ EMBEREK?**

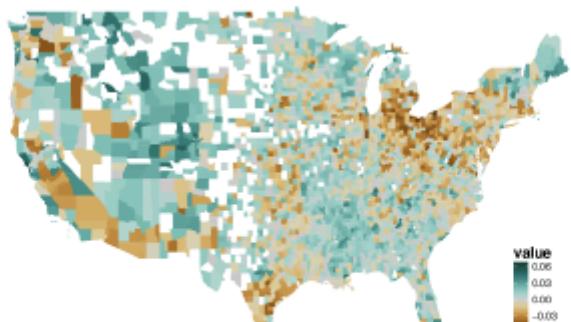
Egy galaxis színkép elemzésre kidolgozott módszer alkalmazása a  
szövegek elemzésére



value  
0.04  
0.02  
0.00  
-0.02



value  
0.025  
0.000  
-0.025  
-0.050



value  
0.06  
0.03  
0.00  
-0.03  
-0.06

thanks perfect please looks mayor  
actually amazing holy hour  
seriously doesn't idea guy  
great guys does year sorry  
makes ever pretty sounds  
hours little dad  
weather best awesome sure  
haha nice everyone two weird  
awkward friends mom sticks isn't  
anyone anyone mom someone favorite  
friends anyone mom someone maybe  
fun wait

(f)

company posted campus university  
community office class drinking  
party team free lunch work  
garden manager group **pic** grill bar  
photo library coffee others  
services gym park dinner ousted  
street market center starbucks  
black building ousted starbucks  
migas hall club mall casa  
building wine fitness cafe place  
migas wine fitness cafe medical

(g)

doesn't talk everyone alright always  
wishes anything kidding  
probably anything wants  
gonna hate seriously forever  
tomorrow boyfriend wanna someone  
wanna anyone dumb texts  
texting boyfriend someone  
anymore bad dad texts  
text okay shut asleep  
hurts mood bad idk yeah  
crying seven never lololweird  
sucks pisses honestly annoying  
feels cuddle suck suck honestly  
awake

(h)

swear nobody tryna  
gotta bout lmao wat.  
ain't jus' call jus  
ain't lilyall hoe  
smh nigga wit  
madaint boo ass  
imma everybody sleepy  
cause head

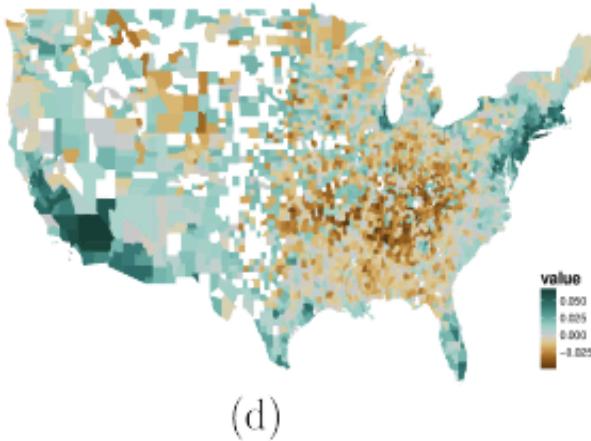
(k)

find wish wouldn't  
december everything bed  
else march say text  
00am glad talk  
nws.better ready  
warning well ready  
issued tell app  
weather tired saying  
anything 00pm sure  
t-storm advisory heart  
truck stupid smile

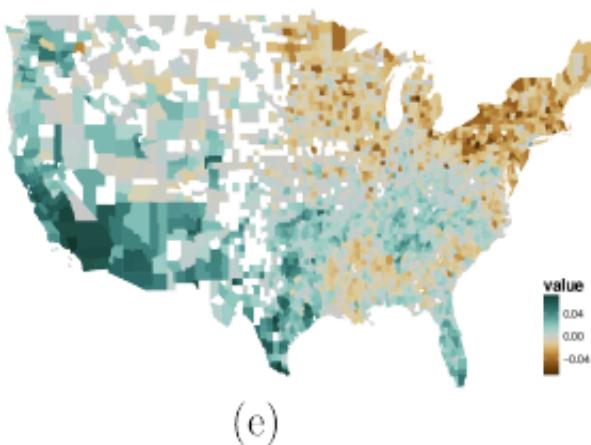
(l)

store headed folks  
catch morning full  
ready new enjoy  
show place may  
big app visiting  
road 2012 service  
new check photo  
place app trip  
mobile local check  
watching hotel pic posted  
enjoying site 1st mayor  
city another world awesome  
long restaurant free old  
state top afternoon

(m)



(d)



(e)

awful couldn't freaking  
hope alabama granny  
may porch thankful bet break  
georgia nerves if redneck  
prayers dang lord stuff tennessee  
dear wellled ikr way sweet  
headed sure sec hush  
coach kentucky sec quit  
heard yep ready praying beside  
pray walmart check craptontonight  
wouldn't blessed enough ootcha  
wonderful

(i)

bathroom puke sitting pissed  
alarm clearly fact pants smell  
cancellel basement hammer paper bus  
shitty summer hours pump  
worst sick drunk holy half fast week  
fucked soon winter coming snowing  
weekend amount snapid

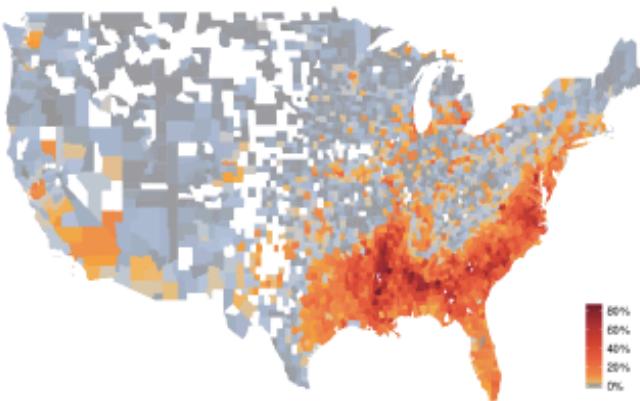
(j)

sexy cant sister gunna brother  
funnyImfaod weed face  
dont fuckin babe lmaoo  
lets stfu bar  
shit chill omg mom dick bored  
stop fishes nice mom assholder whats  
omg mom ugly yup bitch  
smoke thats theres annoying food mom  
thats theres restaurant cute (n)

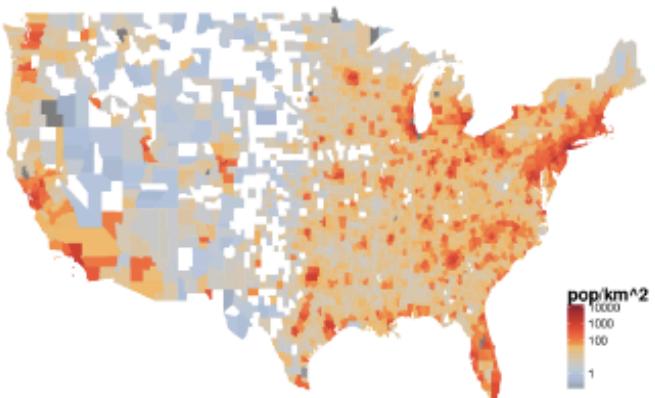
(n)

wanting message  
baby vida reply holable blessed  
whatever casa gracias cute pretty  
amazing amor quiero loved smile estas  
faith pray hoy loves gosh nada bueno feliz  
knows mejor memories loves yay heart heck eso stupid  
mexican hoy gosh nada bueno feliz  
mexico goodnight

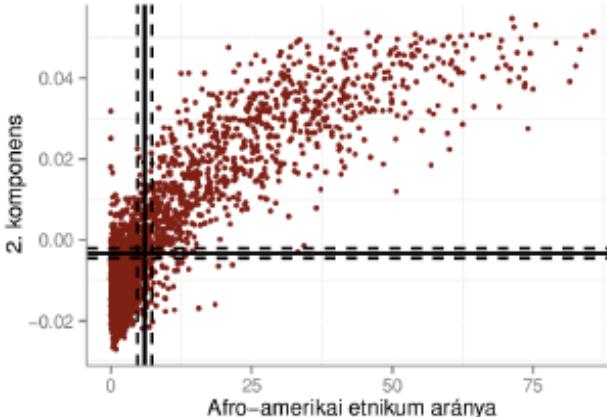
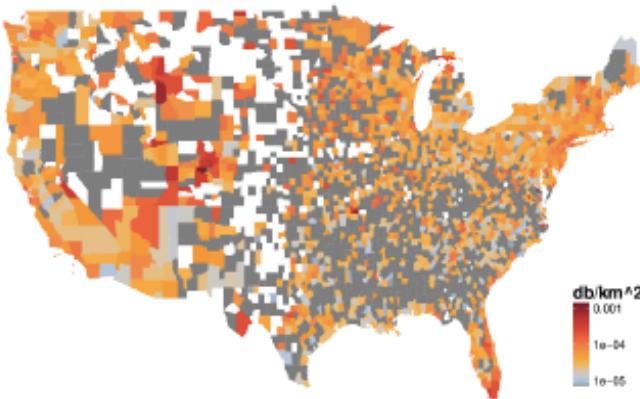
(o)



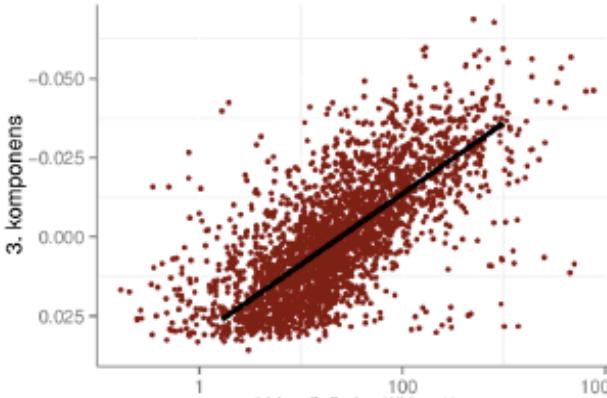
(a)



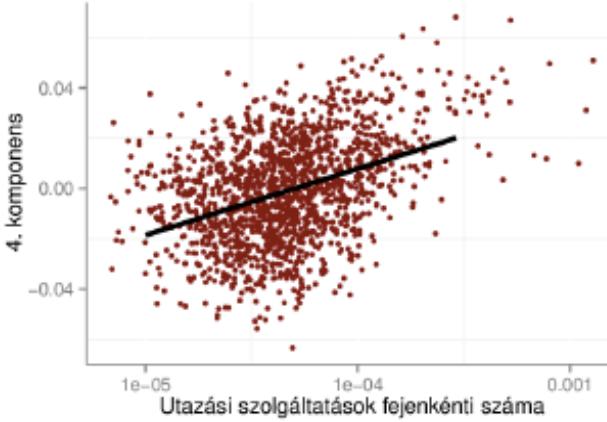
(b)

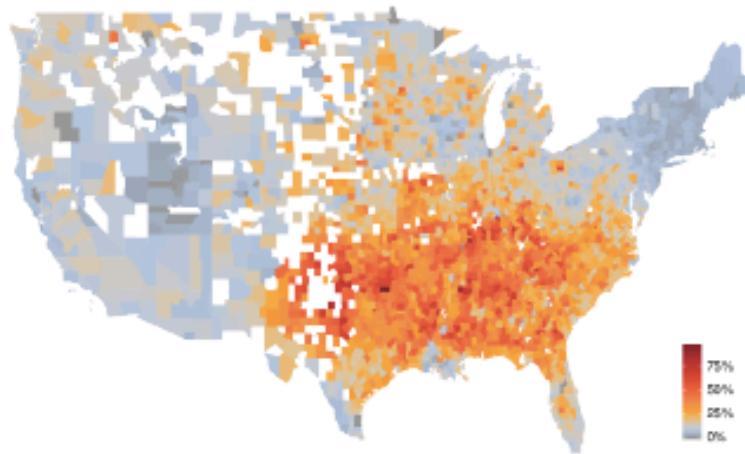


(f)

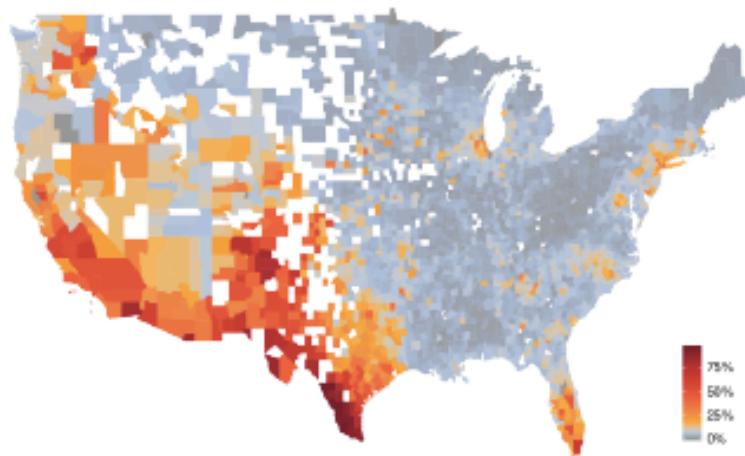


(g)

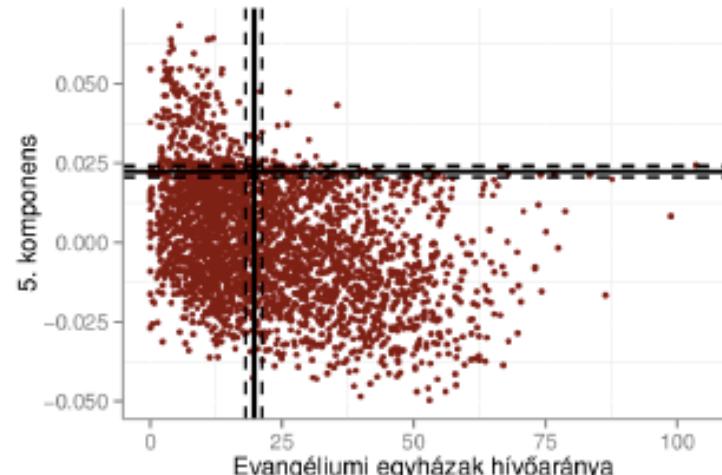




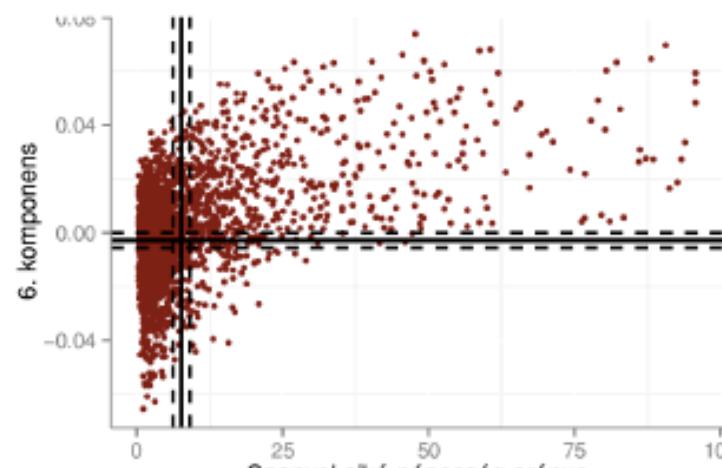
(d)



(e)



(i)

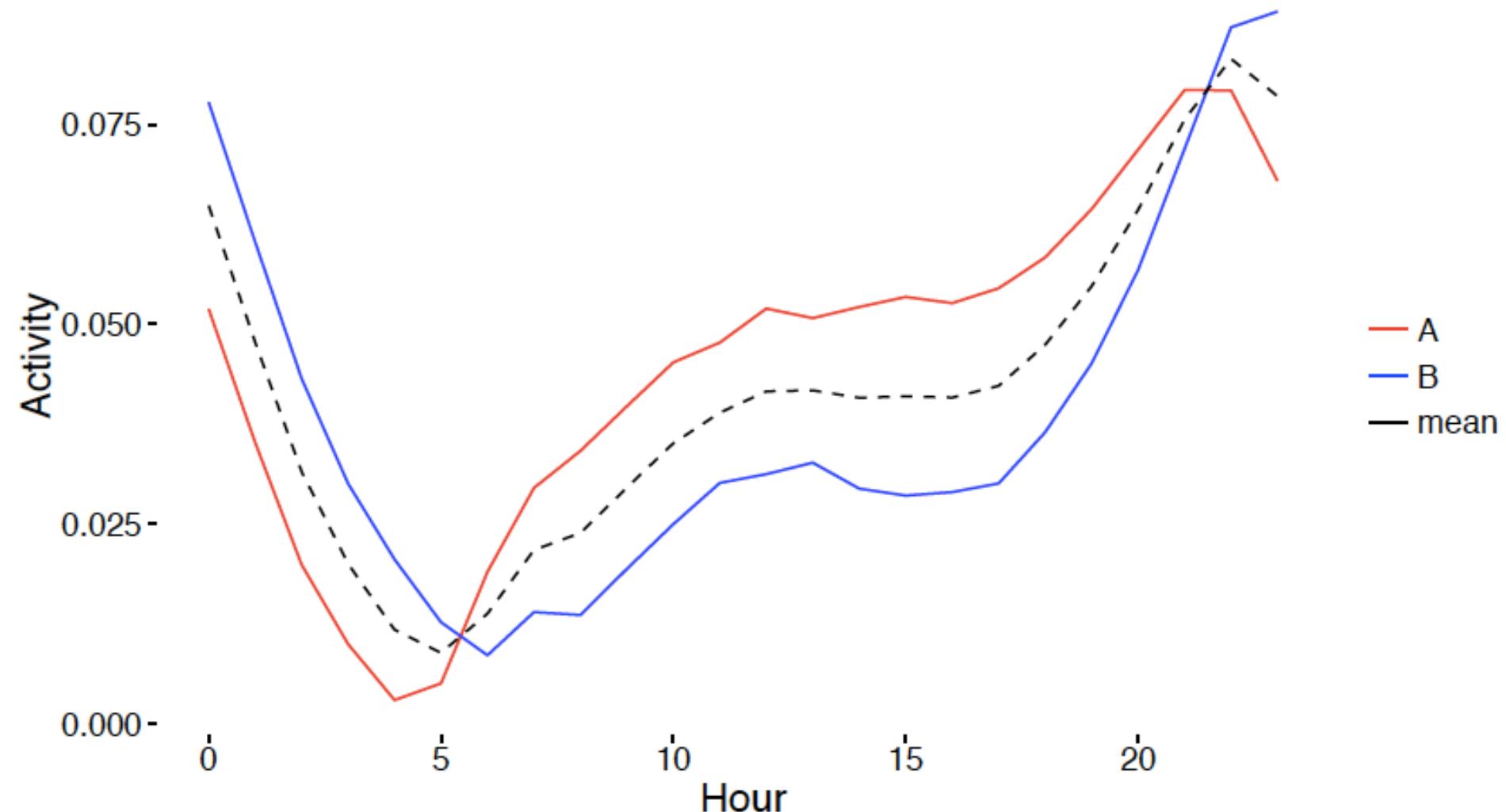


(j)

Statisztikai hivatal a számítógépünkön:

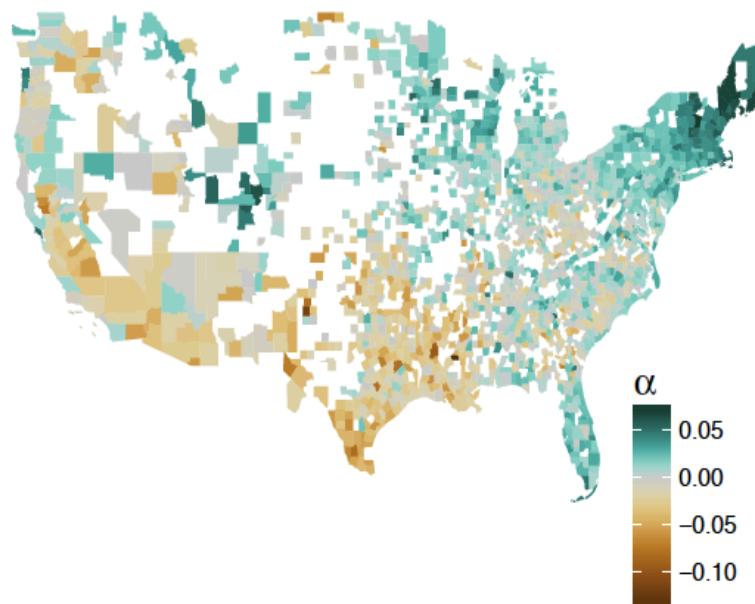
# A MUNKANÉLKÜLISÉG

# Napi twitter aktivitás felbontása aktív és inaktív tweetelőkre

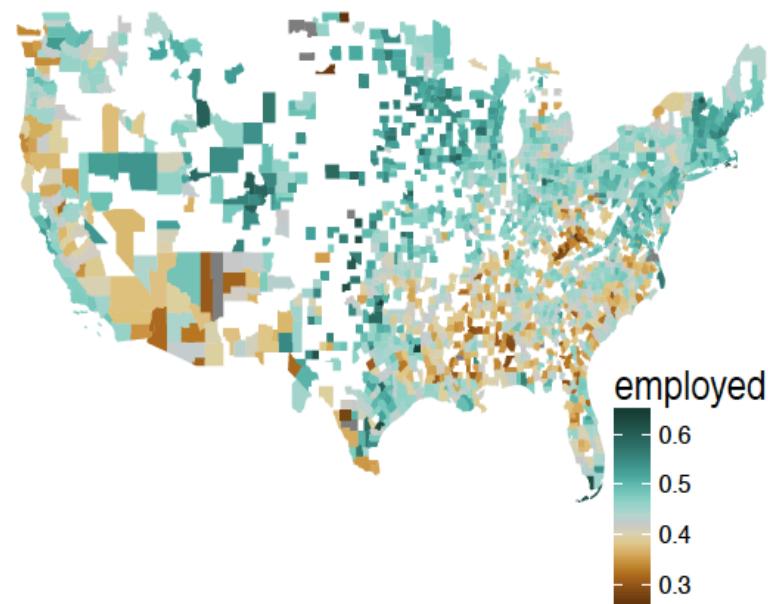


# A számított aktív-inaktív arány és a munkanélküliség összehasonlítása

a



b



# **SZOCIÁLIS HÁLÓZATOK HATÁSA A TÁRSADALOMRA**

A black and white portrait of Joseph Schumpeter, an older man with a mustache, wearing a suit and tie. He is looking slightly to his left. The background is dark.

# **Joseph Schumpeter**

1883-1950

**CREATION**  
**DESTRUCTION**

*in-Spiro*  
IN-SPIRO.DEVANTART.COM | 2010



CSM

L

AE-L  
AF-L

AF-ON

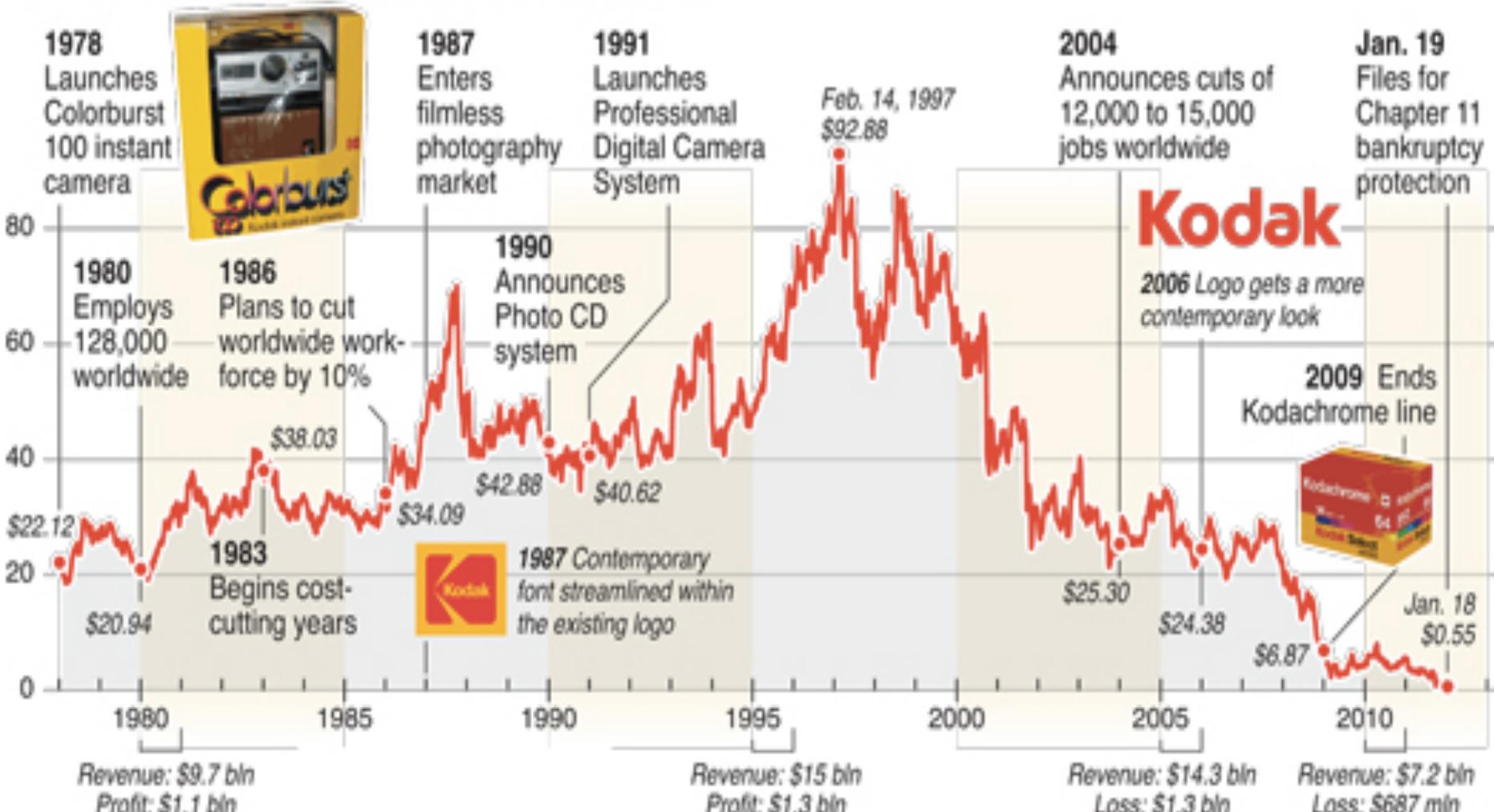


Kodak EasyShare P712

# KODAK FILES FOR BANKRUPTCY

Eastman Kodak Co., a 130-year-old photographic film pioneer, has filed for bankruptcy protection. It said it had also obtained a \$950 million, 18-month credit facility from Citigroup to keep it going

## SHARE PRICE HISTORY – WEEKLY CLOSE IN US\$



Sources: Eastman Kodak Co., Thomson Reuters, news reports

REUTERS



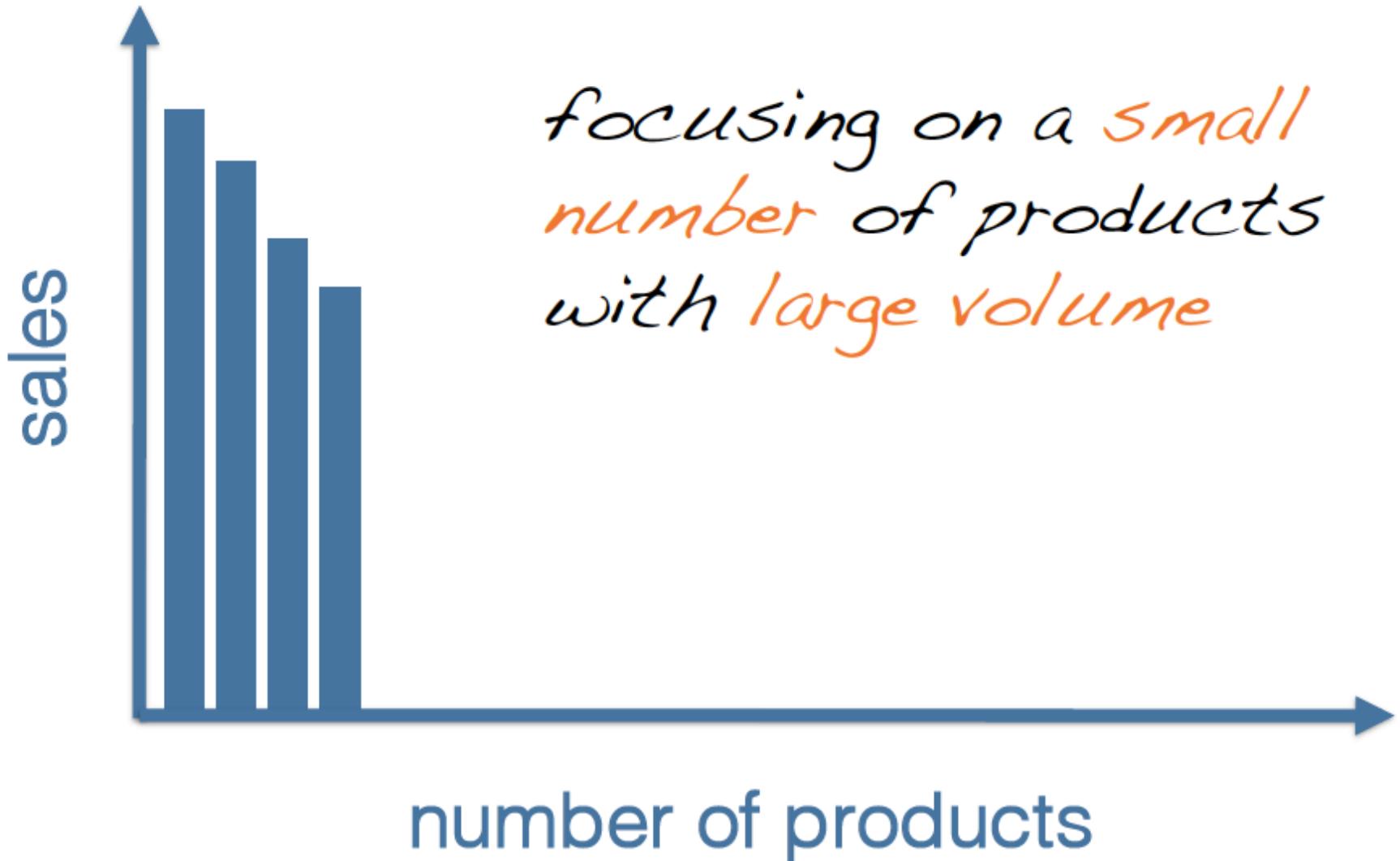
example: music  
business







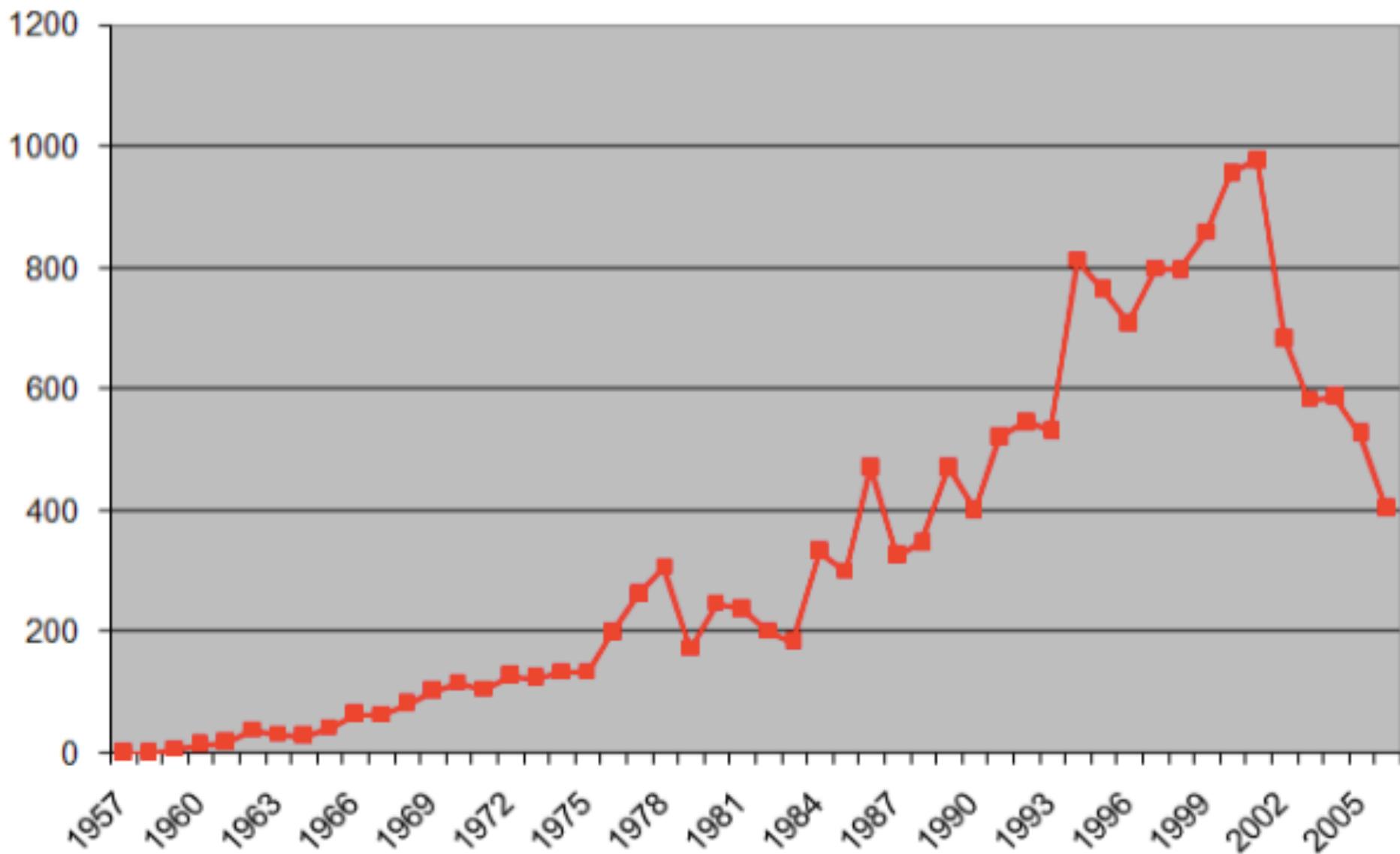
warner | music | group  
wmg







## Hit albums (Gold, Platinum, Multi-Platinum)



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**BLOCKBUSTER  
VIDEO**

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**DVD's**  
\$9.99  
EA.  
OR LESS!

4111

OPEN  
**STORE  
CLOSING**  
EVERYTHING  
**10¢ EACH**

ALL PREVIOUSLY VIEWED  
**DVD's**  
\$9.99  
EA.  
OR LESS!

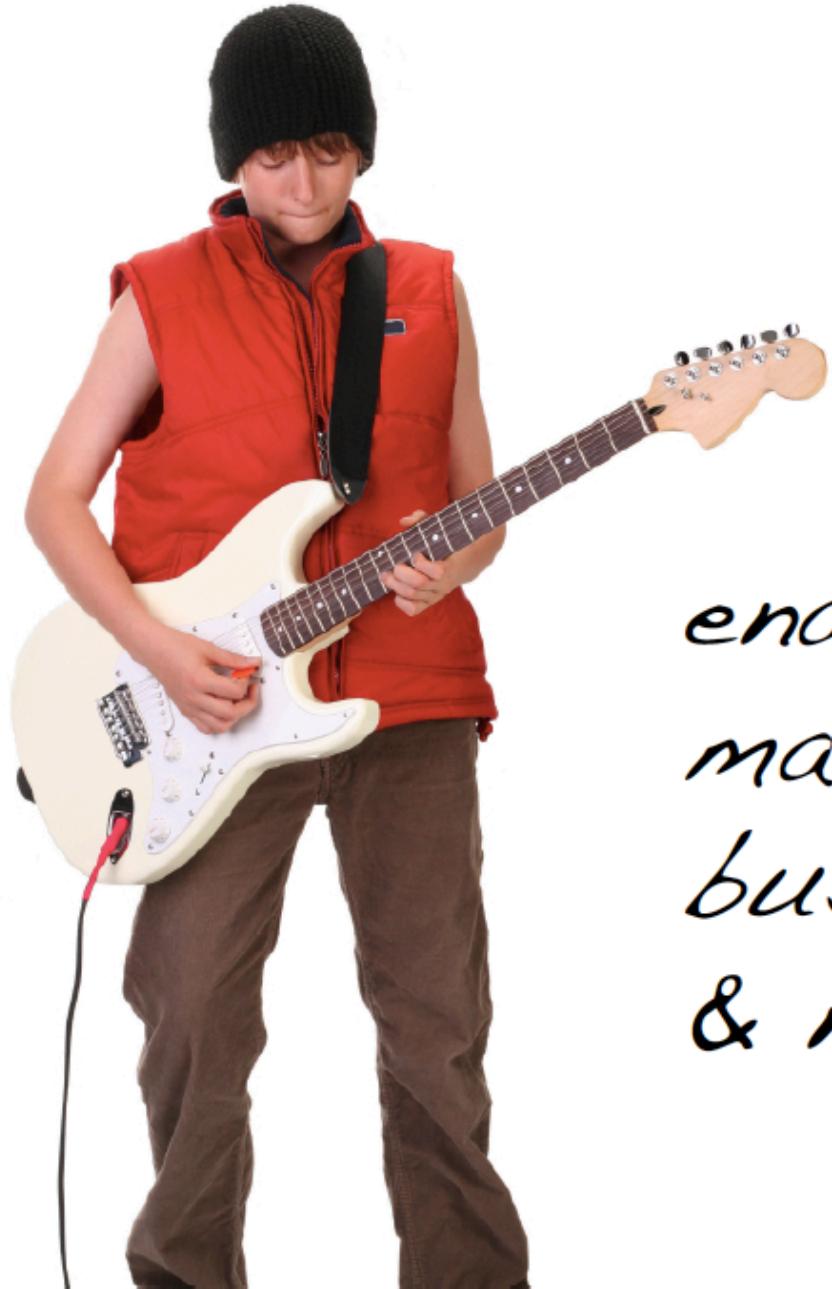
**ENTIRE  
STORE  
ON  
SALE!**

**NOTHING  
HELD  
BACK!**

**ENTIRE  
STORE  
ON  
SALE!**

**ENTIRE  
STORE  
ON  
SALE!**



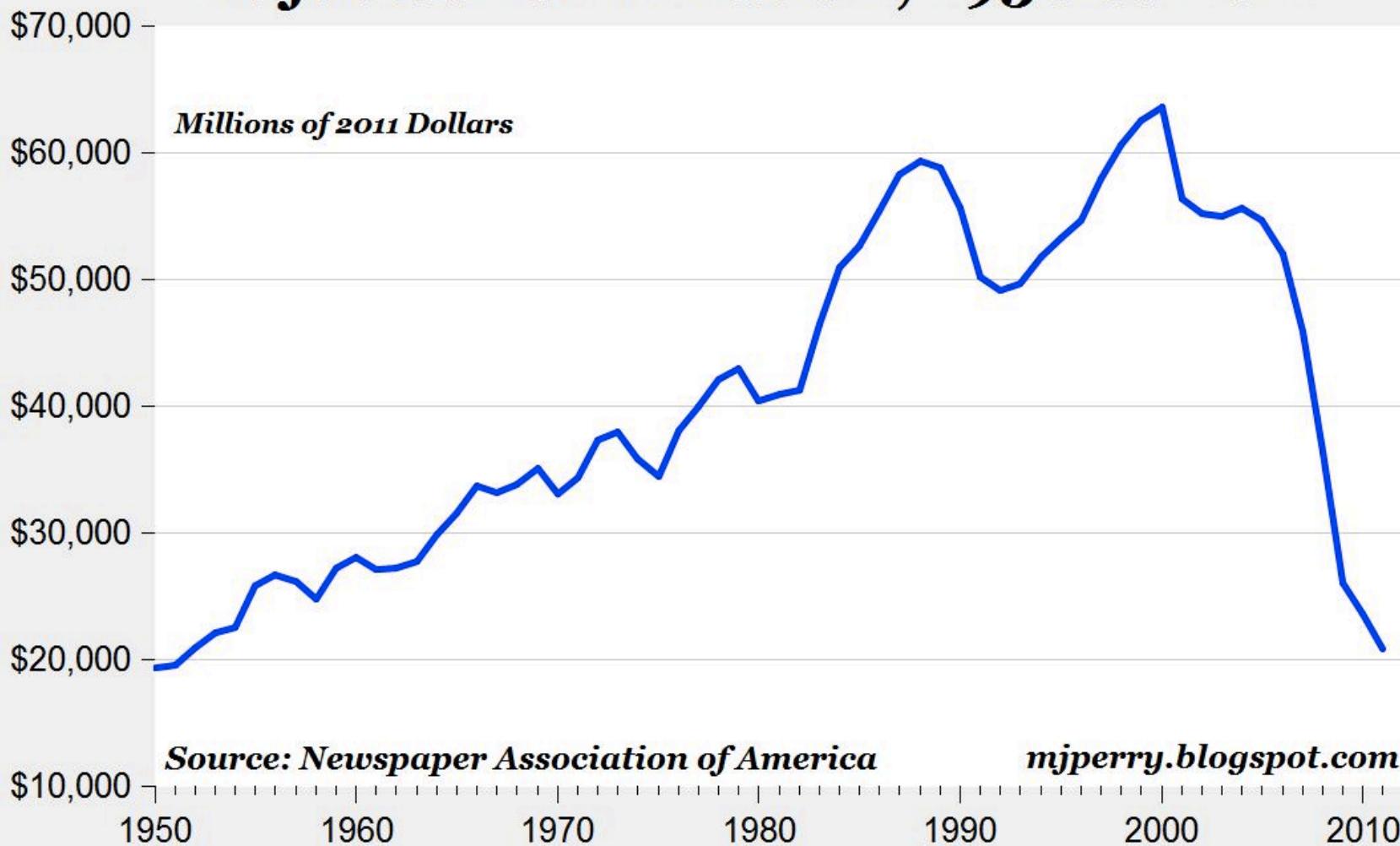


*enabling and  
match-making  
business for new  
& niche talent*



# Feleslegessé válnak a véleményformálók is!

## Print Newspaper Advertising Revenue Adjusted for Inflation, 1950 to 2011





AURELIUS. sc.  
Cololina pinxit.

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Everybody (Python)  
University of Michigan



Fundamentals of Music



Introduction to Finance  
University of Michigan

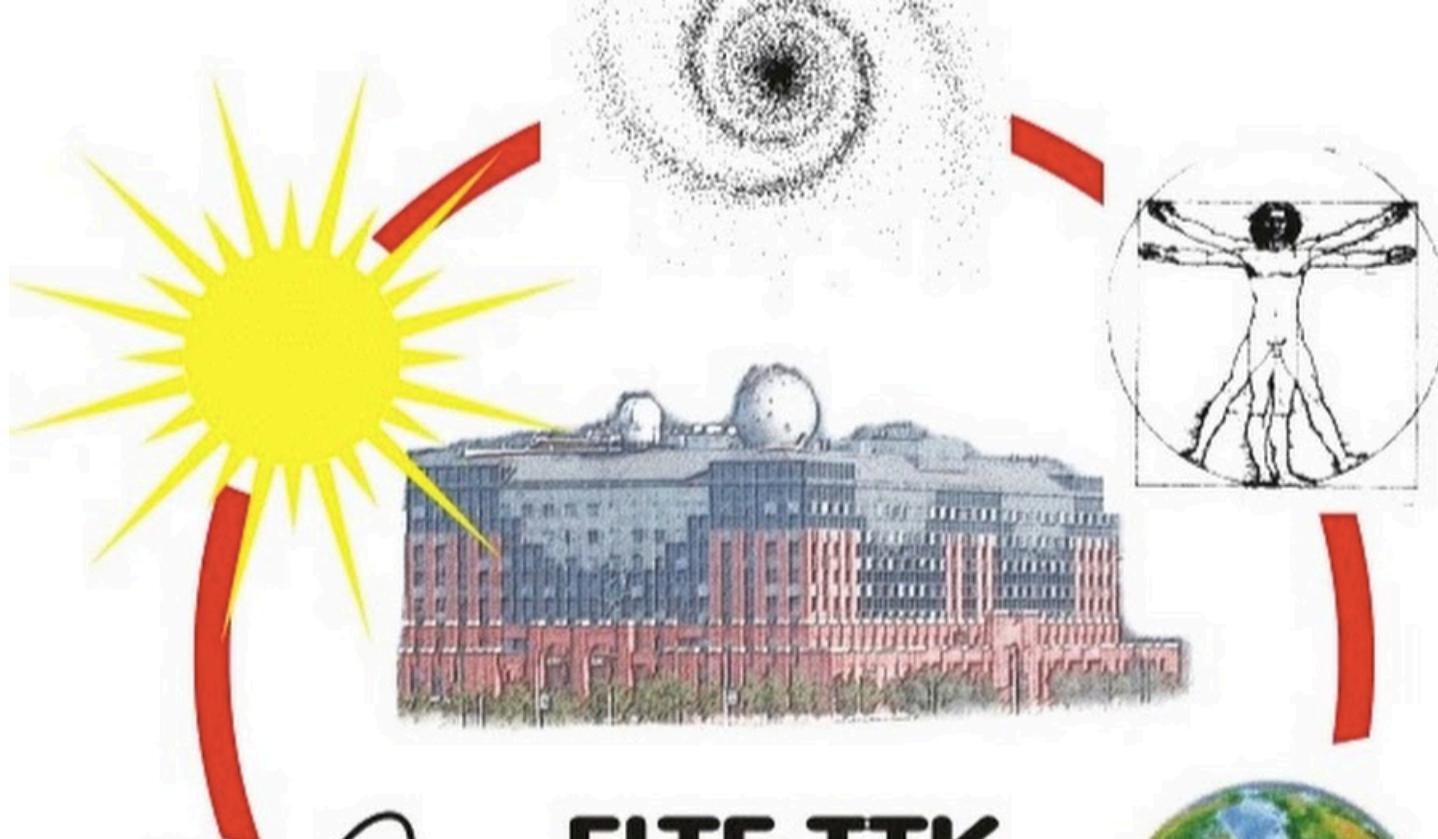


Data Analysis and  
Statistics



Beginning Game  
Programming with C#





# ELTE TTK

## Fizikai Intézet

