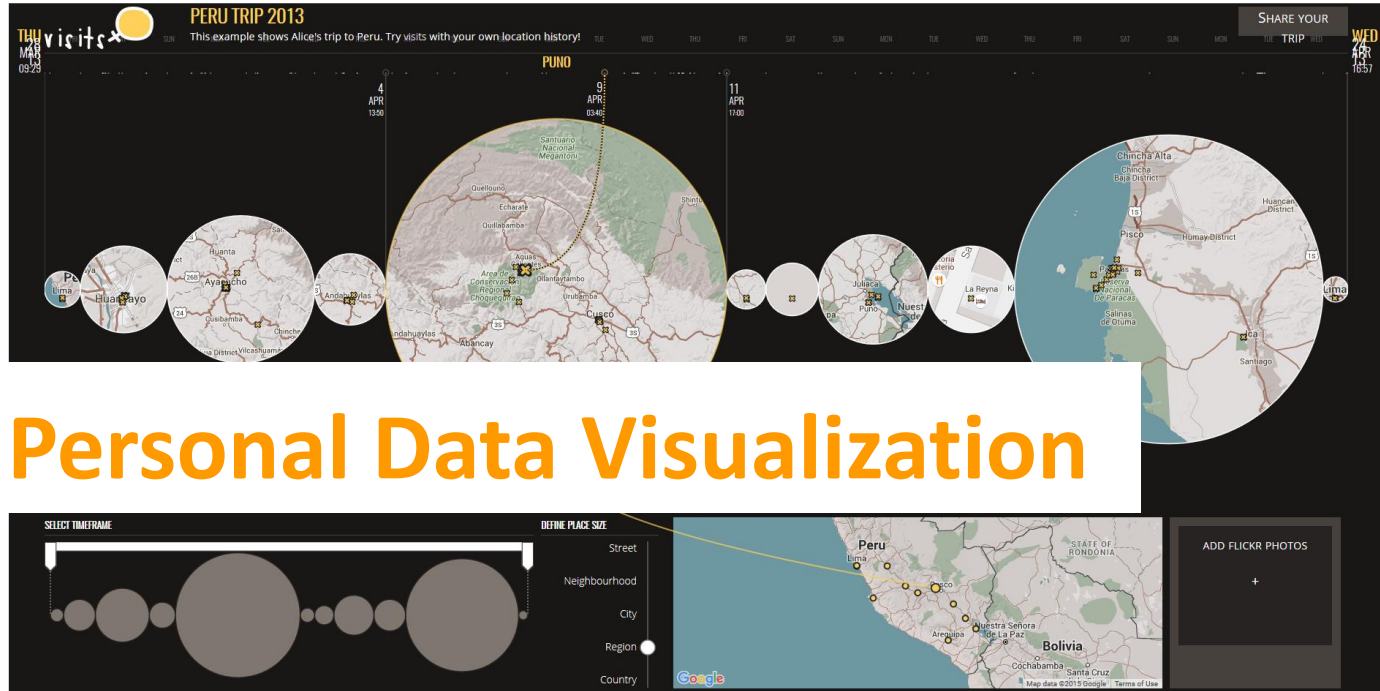


# Session 4.1

## Applications I



## Personal Data Visualization

## Activities

The length and habits of an encounter.

FIGURE 5. AVERAGE LENGTH OF AN ENCOUNTER

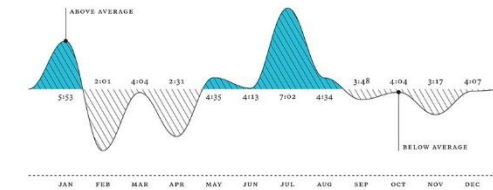
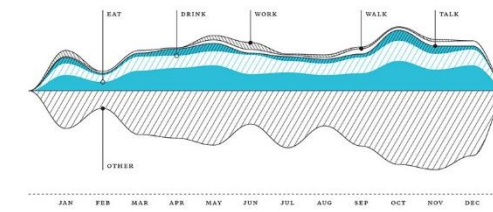


FIGURE 6. FREQUENTLY REPORTED ACTIVITIES



CUMULATIVE REPORTING TIME

**Three Months**  
99 DAYS, 8 HOURS AND 17 MINUTES

AVERAGE ENCOUNTER LENGTH

**Four Hours**  
4 HOURS, 15 MINUTES AND 15 SECONDS

DJING TO DANCING RATIO

**5:4**

AVERAGE ACTIVITIES PER ENCOUNTER

**2.3**

MOST FREQUENT ACTIVITY

**Dinner**  
105 REPORTS

MOST ACTIVITIES IN A MONTH

**157**  
OCTOBER

INSTANCES OF LAUGHTER

**14**

QUESTION 3:  
APPROXIMATELY HOW LONG  
WAS YOUR ENCOUNTER?

A total of about 60 minutes.  
LOREI, JANUARY 7

10am-11pm on 03/26/09.  
RUKI, MARCH 26

900 seconds.  
CHRISTOPHER K, APRIL 2

3 hours (they always seem  
to be 3 hours!)  
BONNIE, JUNE 19

Personal - 7 mins;  
Impersonal - 35 mins.  
ANDREW K, AUGUST 19

7 hours 30 minutes.  
MARINA F, DECEMBER 24

QUESTION 4:  
WHAT ACTIVITIES DID YOU AND  
NICHOLAS PARTICIPATE IN?

Drinking, in a social sense.  
KRIS, JANUARY 7

A walk to the peak, riding  
roller coasters at Ocean  
Park, browsing for books.  
DANIELLE, JANUARY 18

Conversation,  
light computer use.  
NICK S, MARCH 31

Chomp chomp chomp.  
GORDON, MAY 18

Ate crabs, drank, watched  
fireworks, got ice cream.  
AARON S, JULY 10

Reviewing work.  
MIKE A, AUGUST 12

Waiting for a plane.  
GIDRON, OCTOBER 25

Studio tour;  
business meeting.  
WILLY, NOVEMBER 23

# personal visualization - outline

- Characteristics
- Challenges
- Case studies
  - Visualization for behaviour change
  - Autobiographical visualizations
- Design process: computational & manual

what is personal visualization?

# personal visualization

Personal visualization involves the design of interactive visual data representations for use in a personal context.

Huang et al., 2014

Huang et al. Personal Visualization and Personal Visual Analytics. IEEE TVCG, 21 (3), 2015  
<https://innovis.cpssc.ucalgary.ca/innovis/uploads/Publications/Publications/pvpva.pdf>

# personal context

- Exploring data voluntarily, in your own spare time
- Looking at data that is somehow of personal interest
  - Personal data (e.g., personal sports activity, email, location history, environmental footprint,...)
  - Data of personal interest (e.g., data about books, census data, traffic situation, weather,...)



Fitbit Dashboard



Not for external use

# Influence of the personal context

- Interpretation and experience of data and their visualization
- User-driven design considerations
  - Motivation and goals of the user
  - Background, skills and preferences of the user
- External design constraints
  - Physical environment in which the visualization will be used
  - Devices and/or technology on which the visualization will be presented
  - Social factors

# “traditional” vs. personal InfoVis

## user-driven design considerations

- Work/professional context
  - Some prior training can be assumed
  - Defined professional goals
  - Potentially high time commitment
  - Professional considerations may outweigh personal preferences
- Personal context
  - Diverse skills / no expertise can be assumed
  - Broad range of goals
  - High to low time commitment
  - Personal preferences are very relevant
  - Personal background, culture and prior experience will drive the analysis and interpretation
  - Self-centred perspective on the visualization

# “traditional” vs. personal InfoVis

## external design constraints

- Work/professional context

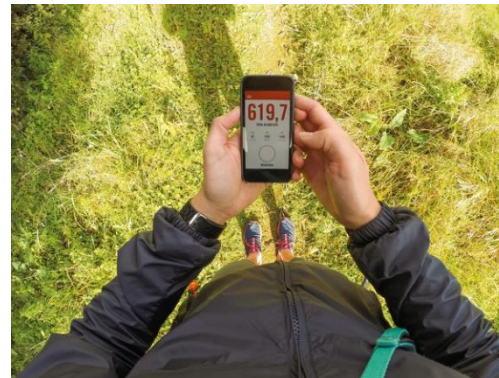
- Professional environment
- Colleagues as peers
- Access to analytical tools
- Access to technology



<https://www.evl.uic.edu/application-papers>

- Personal context

- Personal environment (home, coffee shop, train...)
- Family and friends as peers
- Limited access to analytical tools
- Limited access to technology



[http://www.nature.com/nature/journal/v527/n7576\\_suppl/full/527S12a.html](http://www.nature.com/nature/journal/v527/n7576_suppl/full/527S12a.html)

Not for external use



# personal visualization – guiding questions

- How can the power of visualization be made appropriate for use in personal contexts – including people who have little experience with data, visualization, or statistical reasoning?
- How can we visually represent data to make **positive changes in our personal lives** and the lives of others?
- How can we use visualizations to facilitate insights that **empower people** on a personal and societal level?
- How can we use visualization to promote **critical thinking** (about data and vis)?

# challenges of personal visualization

- All sorts of data is available BUT
  - Availability of data does not mean that people can gain insights from it
- Data has to be represented in a way that makes it
  - Accessible
  - Understandable
  - Interpretable
- Personal visualization technology has to be carefully designed to fit into people's daily environments and routines
  - Potential privacy concerns and resulting restrictions on what to represent and how
- Evaluation: what makes a personal visualization successful?

# personal visualization – topics of focus

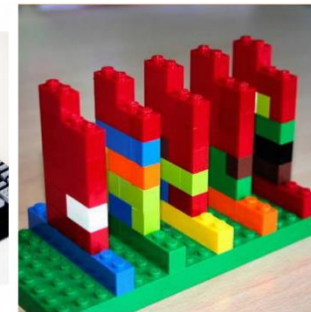
- Residential energy consumption
- Fitness
- Personal health
- Social networks
- Life logging
- Personal finance
- Recycling behaviour
- Commuting
- ...



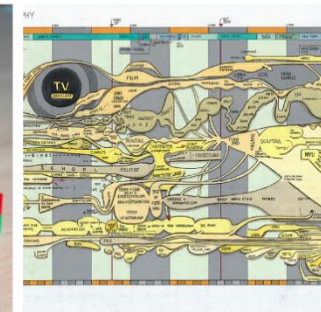
LOCATION BASED JEWELLERY  
Mikaela



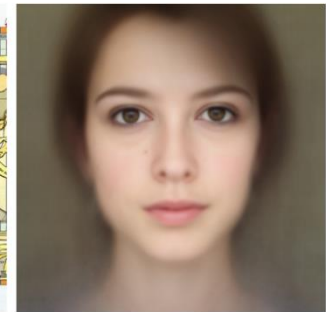
PSYCHOGEOGRAPHICAL MAPPING  
Mikaela



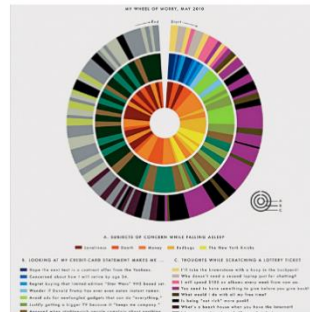
LED POWERED TIME TRACKING  
Mikaela



WARD GALLERY - MOTORBIKERY  
Mikaela



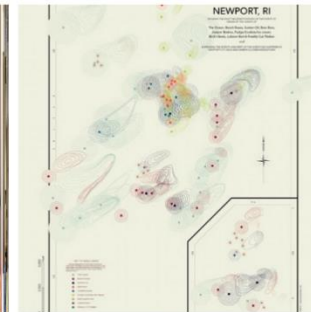
Flicker flash  
Mikaela



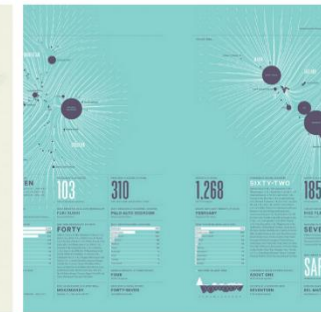
A. SUNBURST CHART  
Mikaela



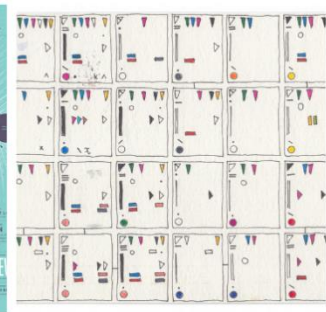
Portrait  
Mikaela



NEWPORT, RI  
Mikaela



DATA VISUALIZATION  
Mikaela



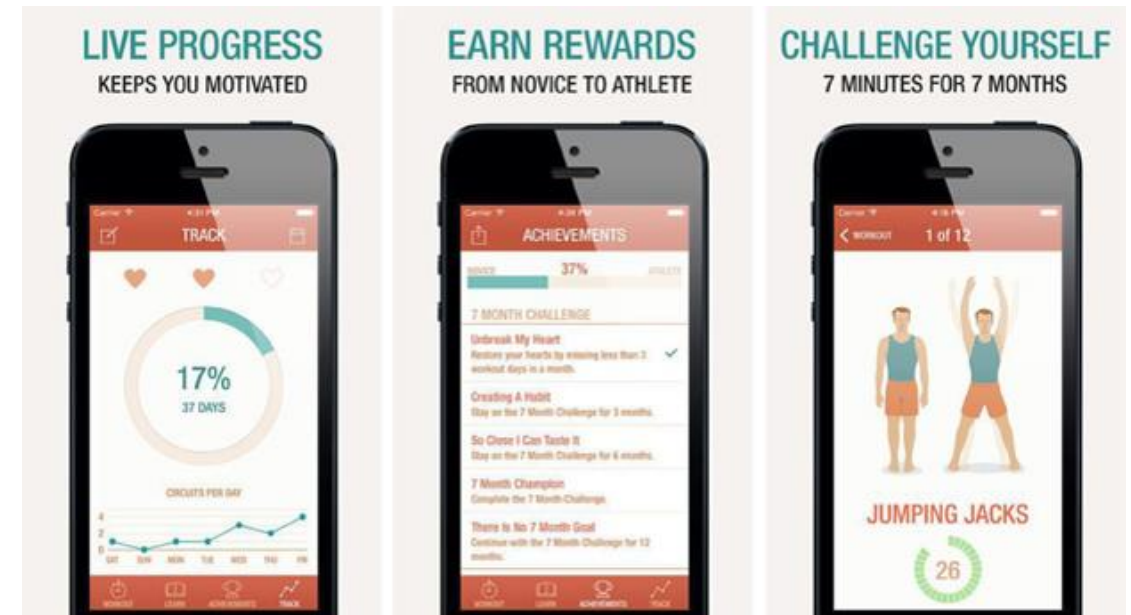
Grid of icons  
Mikaela

<http://vis4me.com/>

Not for external use

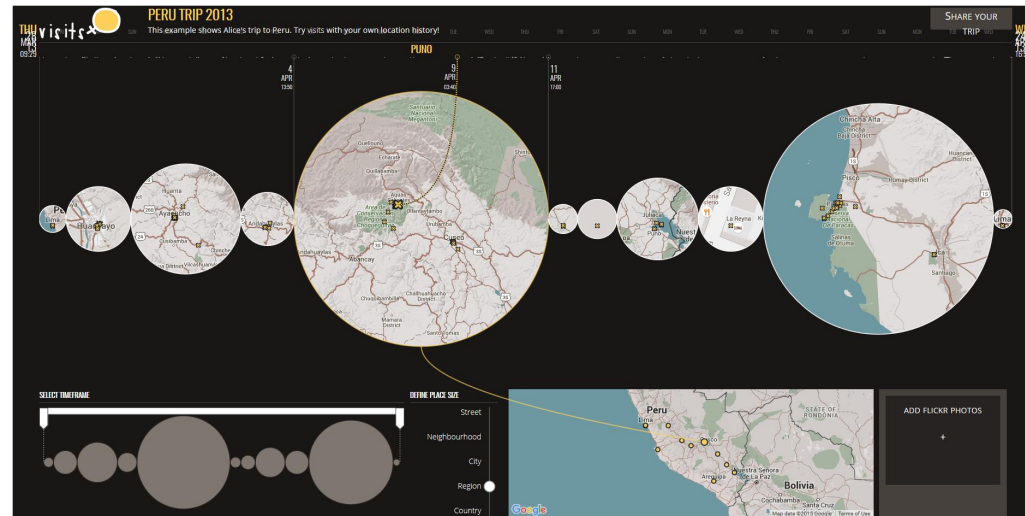
# general applications areas

- Supporting awareness for action
  - Goals
    - Self/life improvement
    - Providing awareness of patterns for immediate action



# general applications areas

- Curiosity-driven exploration of personal data
  - Goals
    - Understanding oneself
    - Open-ended reflection on personal life & behaviour
  - Autobiographical visualization

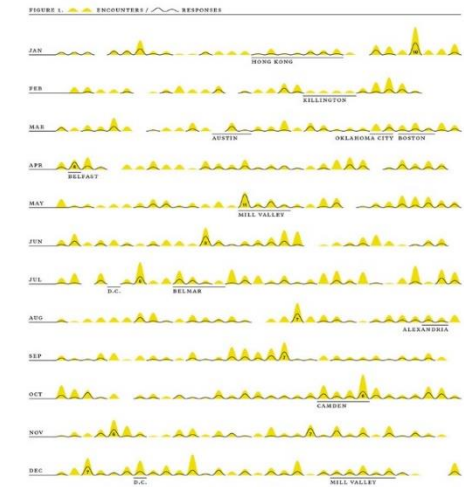


<http://v.isits.in/>

Not for external use

## Distribution

Date and location of encounters.



TOTAL ENCOUNTERS	AVERAGE ENCOUNTERS PER DAY	SURVEYS COMPLETED	CUMULATIVE RESPONSE RATE
1,761	4.8	560	32%
COUNTRIES INCLUDED: Three U.S.A., HONG KONG AND NORTHERN IRELAND	STATES INCLUDED: Nine CALIFORNIA, MAINE, MASSACHUSETTS, NEW JERSEY, NEW YORK, OKLAHOMA, TEXAS, VERMONT, VIRGINIA, FLORIDA, WASHINGTON D.C.	DAYS WITH REPORTS 254 50% OF THE YEAR	CONTRIBUTORS 210 AVERAGE 2.68 REPORTS PER PERSON

**METHODOLOGY**  
Throughout 2009, friends, family, co-workers and acquaintances of Nicholas Felton were asked to report on his activities whenever they met.  
All data on the following pages was compiled from the responses of these participants to a variety of questions concerning their encounter.

<http://feltron.com/FAR09.html>

supporting awareness for action

# visualization to reduce water consumption

- Installed at three households (one week each device)
- Raised awareness
- Preference for ambient vis
  - Increasing numbers are stressful
  - No recommended benchmark
  - Ambient vis: authoritative element of persuasion
- Ambient vis had stronger impact



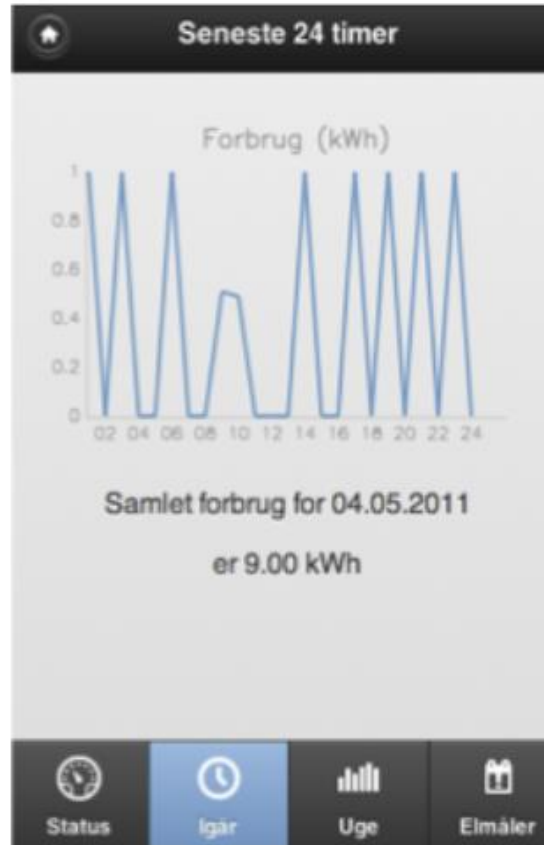
S. Kuznetsov and E. Paulos. UpStream: Motivating Water Conservation with Low-Cost Water Flow Sensing and Persuasive Displays, CHI 2010



# visualization to reduce energy consumption



Power usage for the last week compared to avg.



Power usage over the last 24 hours.



Power consumption per day for the last vs. previous week.

J. Kjeldskov, M.B. Skov, J. Paay, R. Pathmanathan. Using Mobile Phones to Support Sustainability: A Field Study of Residential Electricity Consumption, CHI 2012



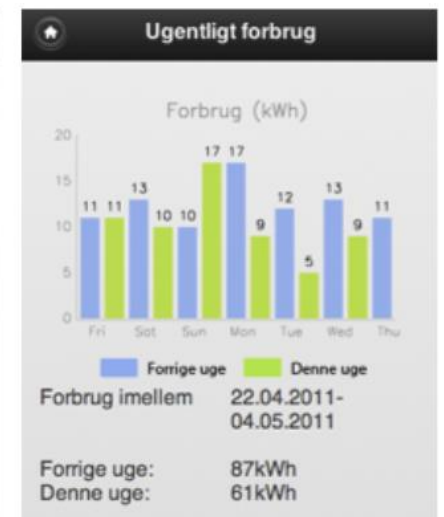
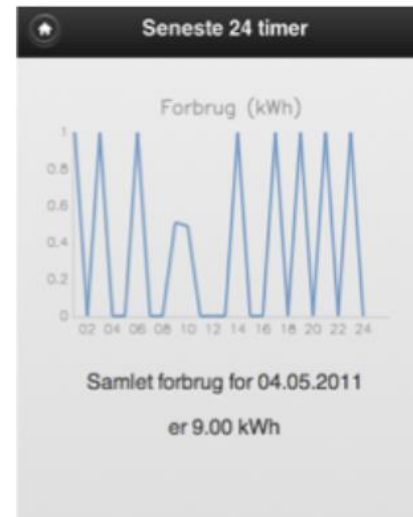
# supporting awareness for action – design considerations

- Easy access to information
  - Visualization on mobile technology
- Awareness via visualization + tailored information
- Importance of benchmark values/view
  - Previous energy consumption
  - Average energy consumption in comparable households
  - Energy consumption of other households in the neighborhood
- Considering people's understanding of the topic
  - Familiarity with unit kWh was assumed but not always given

J. Kjeldskov, M.B. Skov, J. Paay, R. Pathmanathan. Using Mobile Phones to Support Sustainability: A Field Study of Residential Electricity Consumption, CHI 2012

# visualization to reduce energy consumption

- Behavior change via persuasion
  - Colour (traffic light scales)
  - Happy smiley/sad smiley
- Behavior change via information
  - Showing consumption over time
  - Showing data side-by-side



→ Promoting reflection vs. prescribing behavior

# curiosity-driven exploration of personal data

→ Autobiographical visualization

# autobiographical visualizations

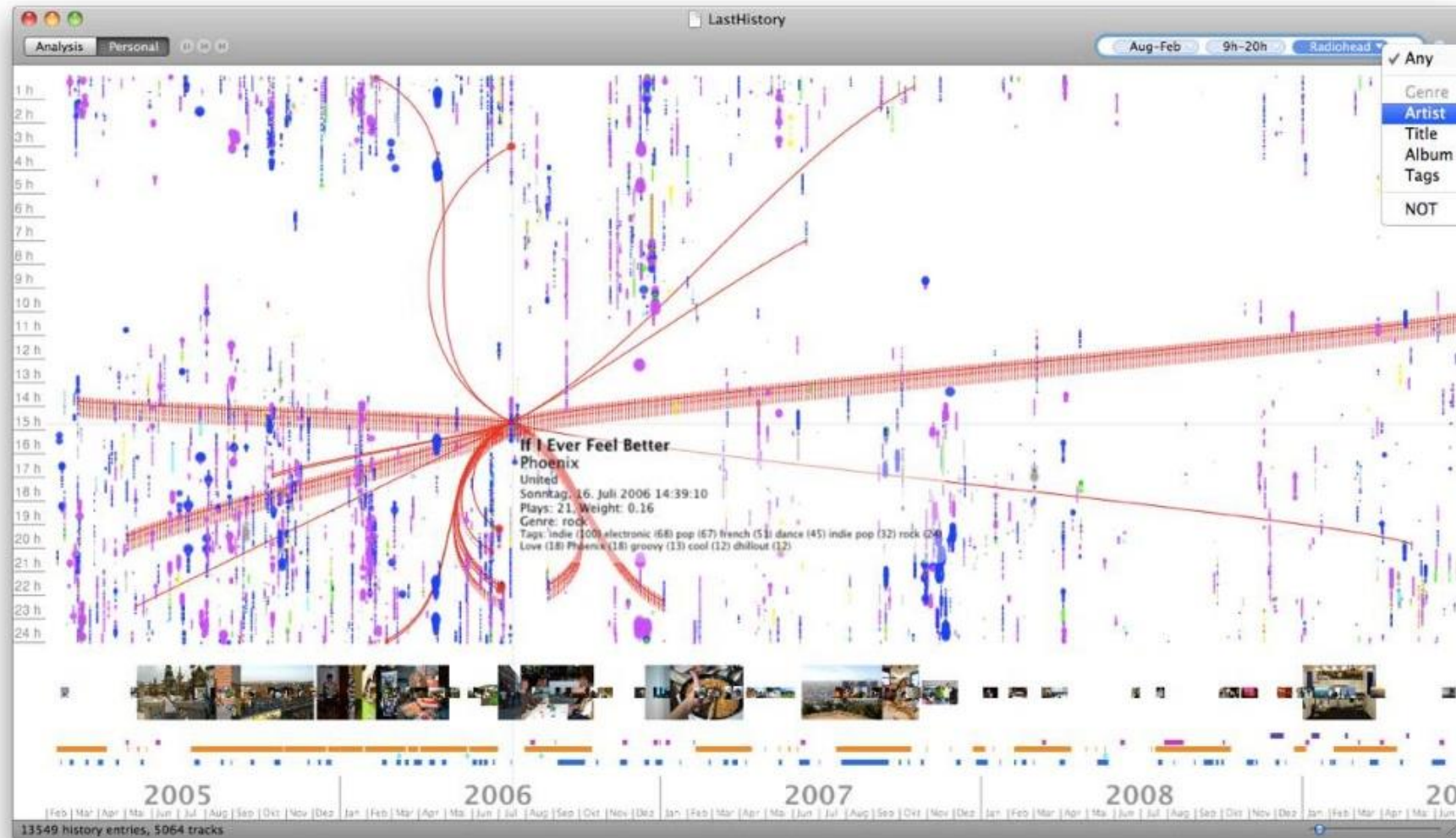
- Visual representations of personal life experiences for the purpose of **reminiscing and storytelling**
- Data that sheds light into actions, thoughts, and life events
  - Automatic life logs: Location data, email, chat protocols, music listening history
  - Manually collected data: Photos, food intake, calendar entries, etc...
- Audience
  - Self
  - Family, friends, colleagues, general public

Thudt et al. Autobiographical Visualizations: Challenges in Personal Storytelling. Workshop “A Personal Perspective on Visualization and Visual Analytics” DIS’14.  
<https://innovis.cpsc.ucalgary.ca/innovis/uploads/Publications/Publications/ThudtDIS2014.pdf>



# streams of our lives

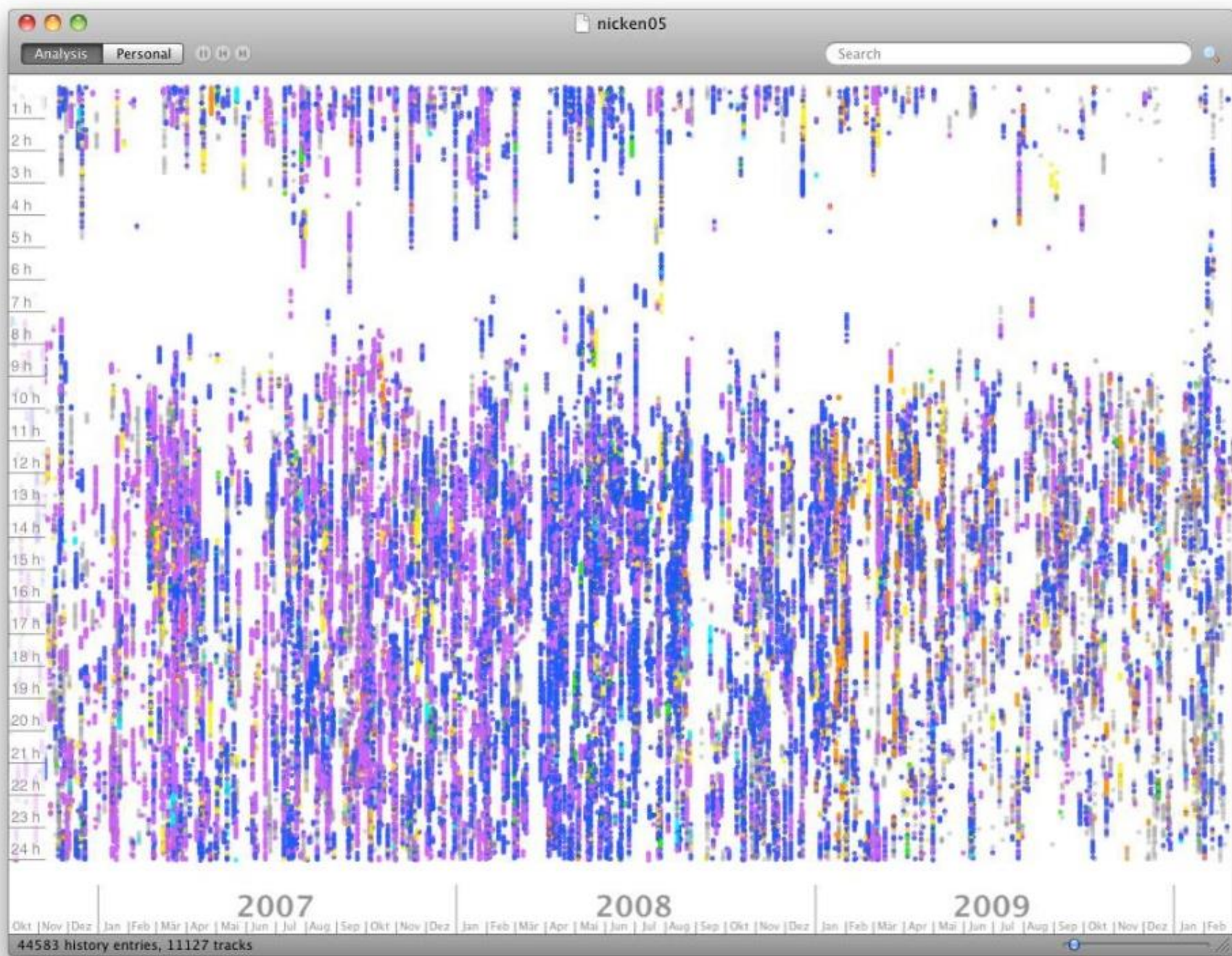
Dominikus Baur, Frederik Seiffert, Michael Sedlmair, Sebastial Boring



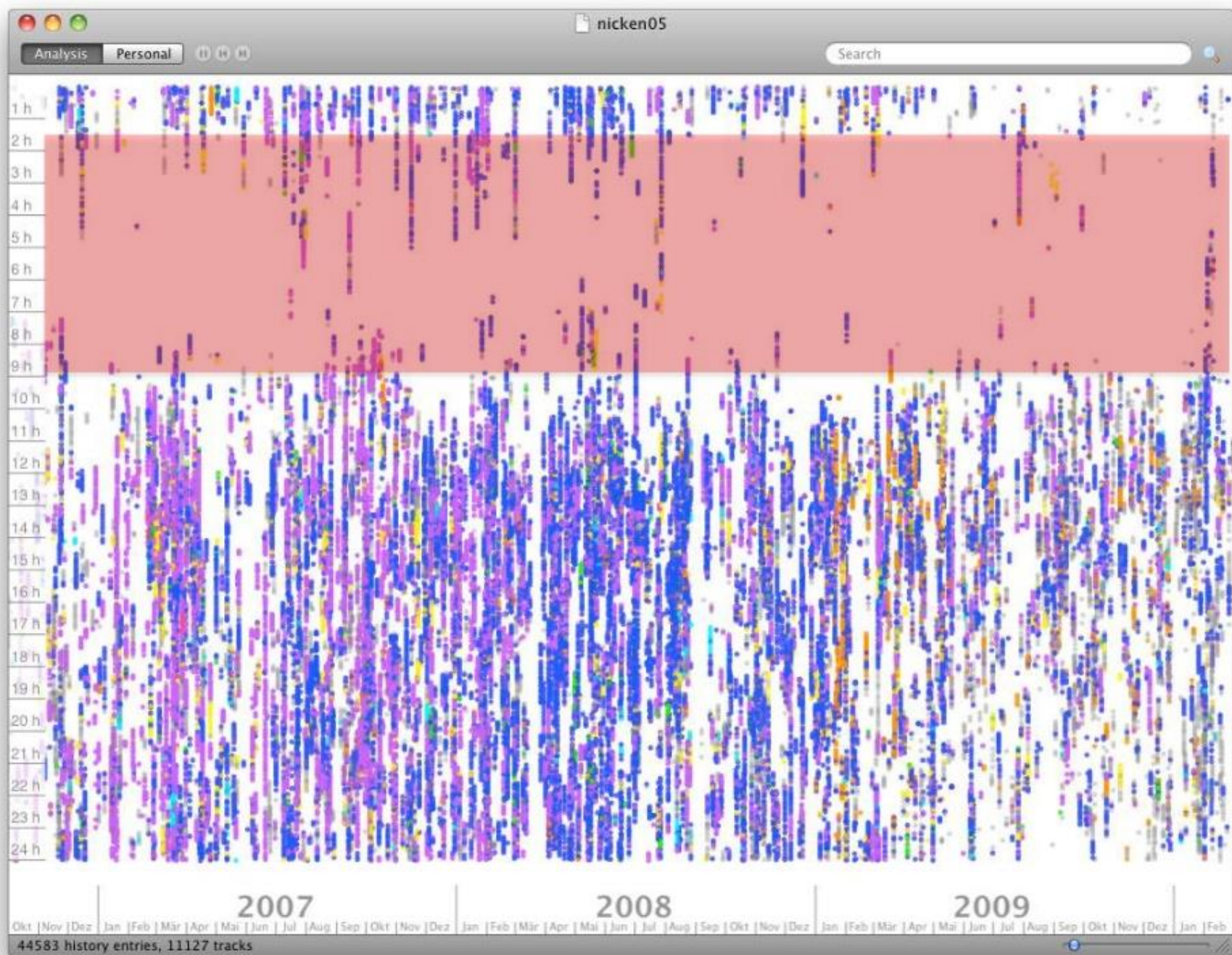
<http://www.frederikseiffert.de/lasthistory/>

Not for external use



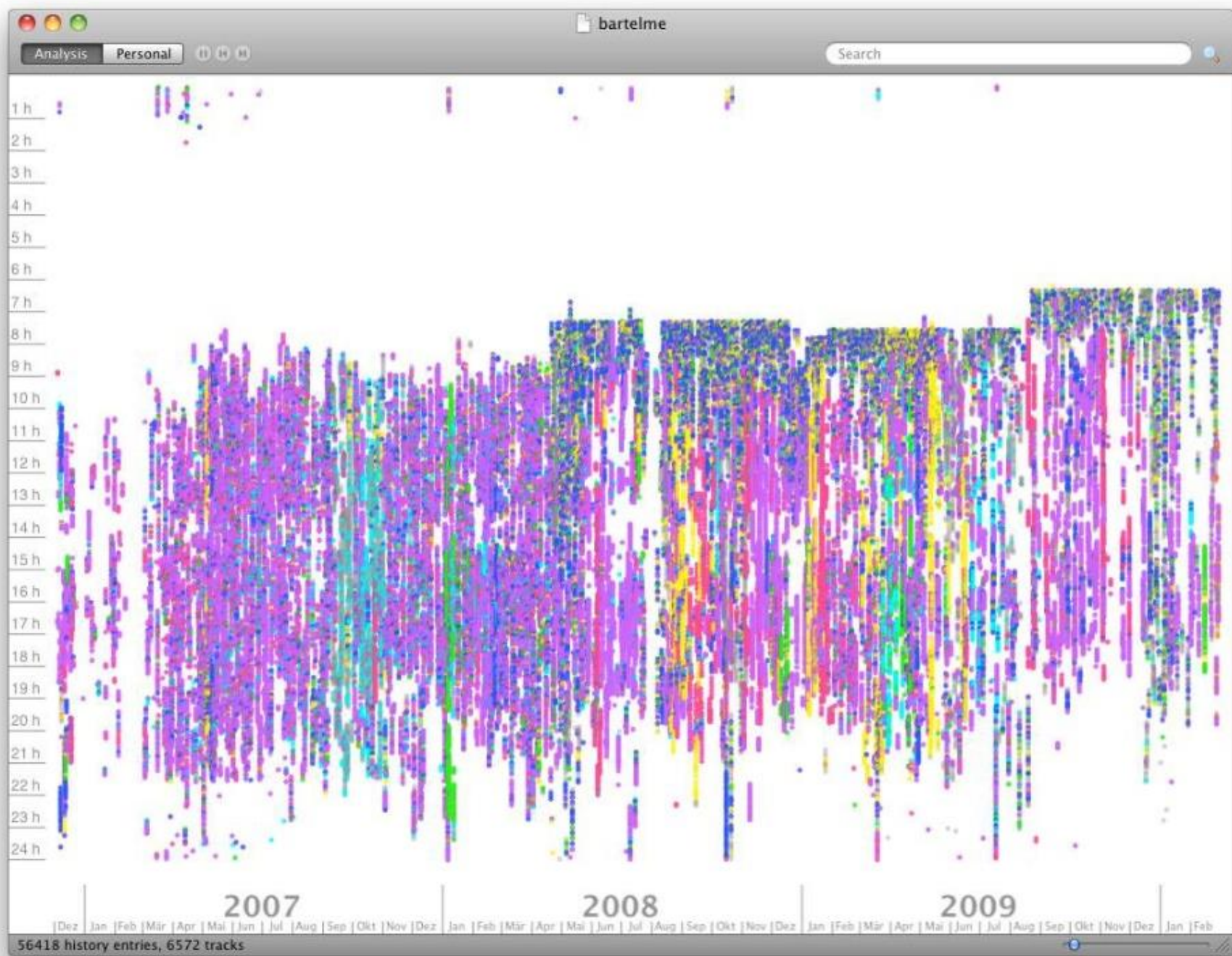






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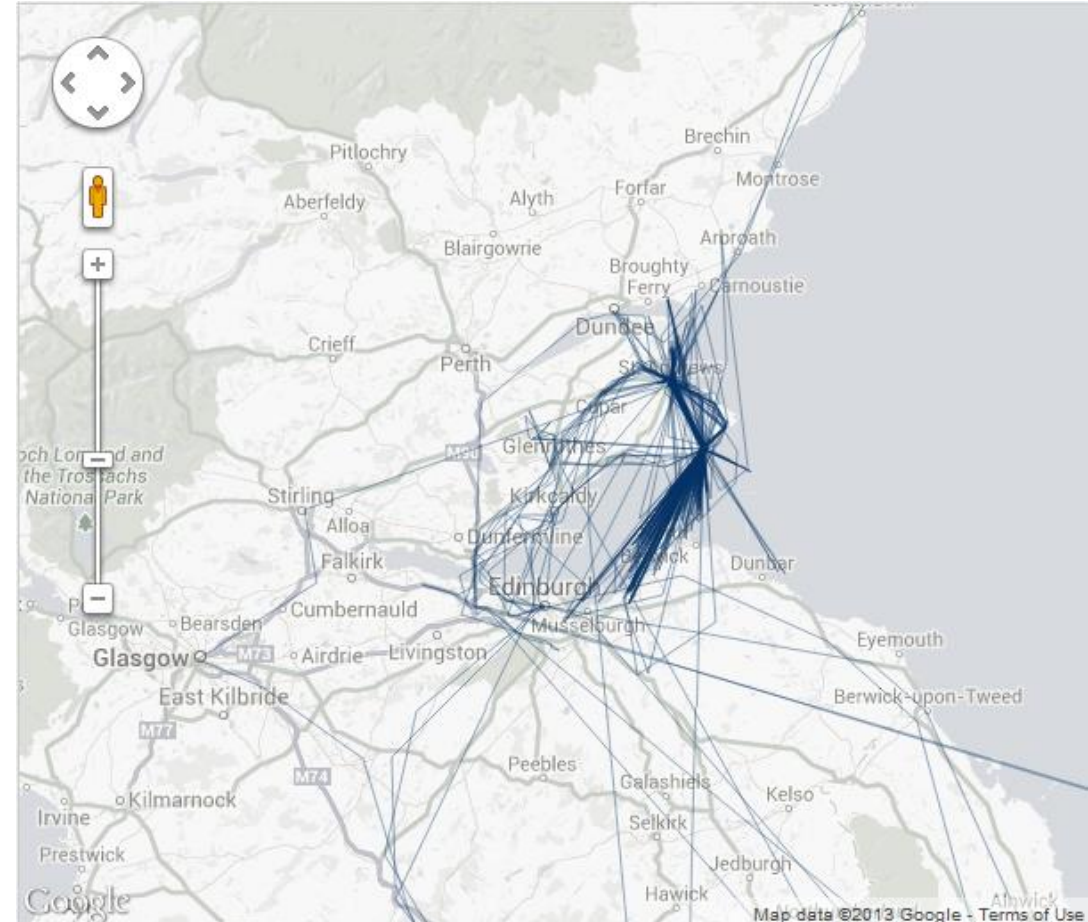


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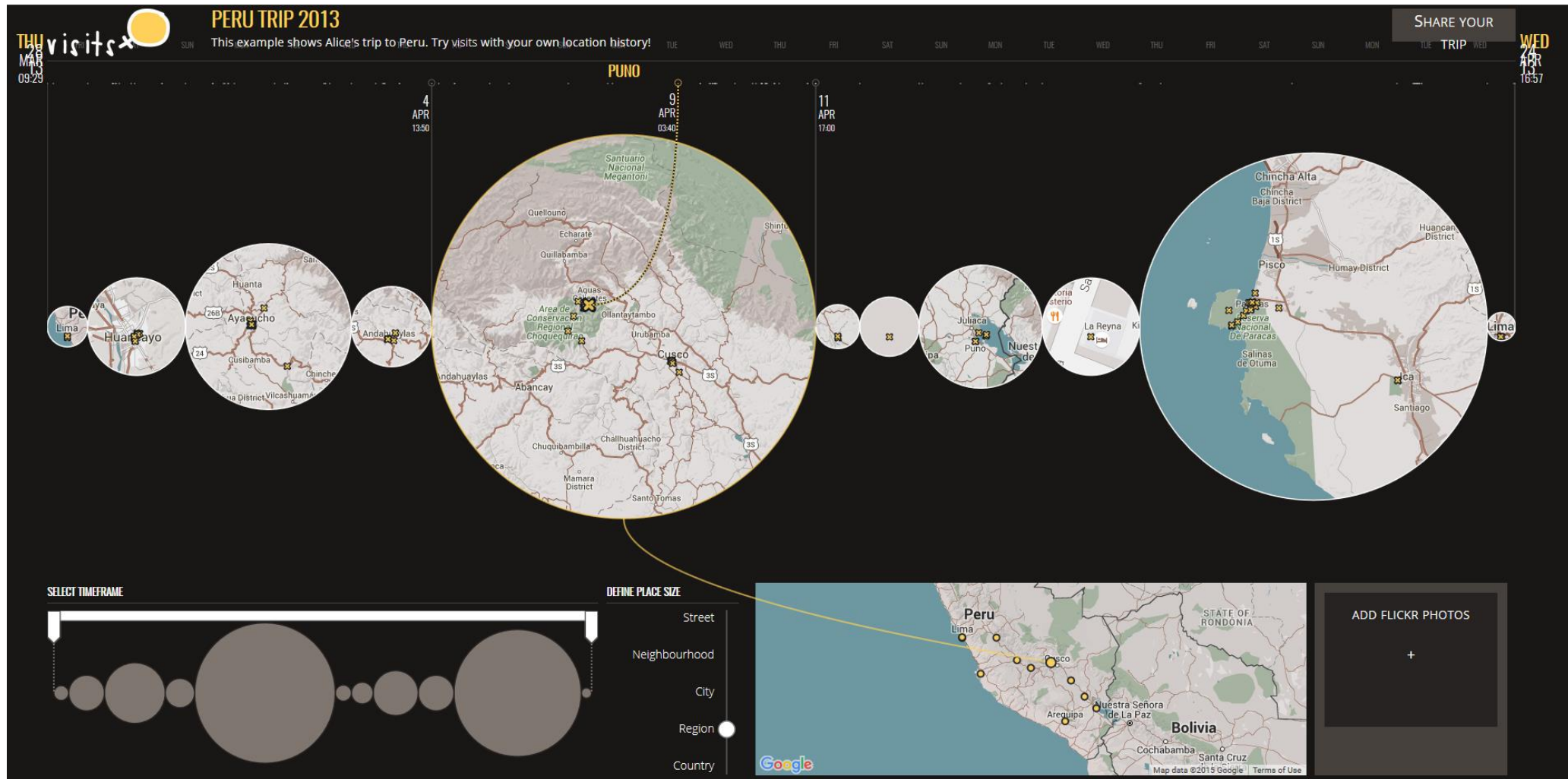
# visits

Alice Thudt, Dominikus Baur, Sheelagh Carpendale

- Shows personal location histories
  - Time + geospatial information



Alice Thudt, Dominikus Baur, Sheelagh Carpendale



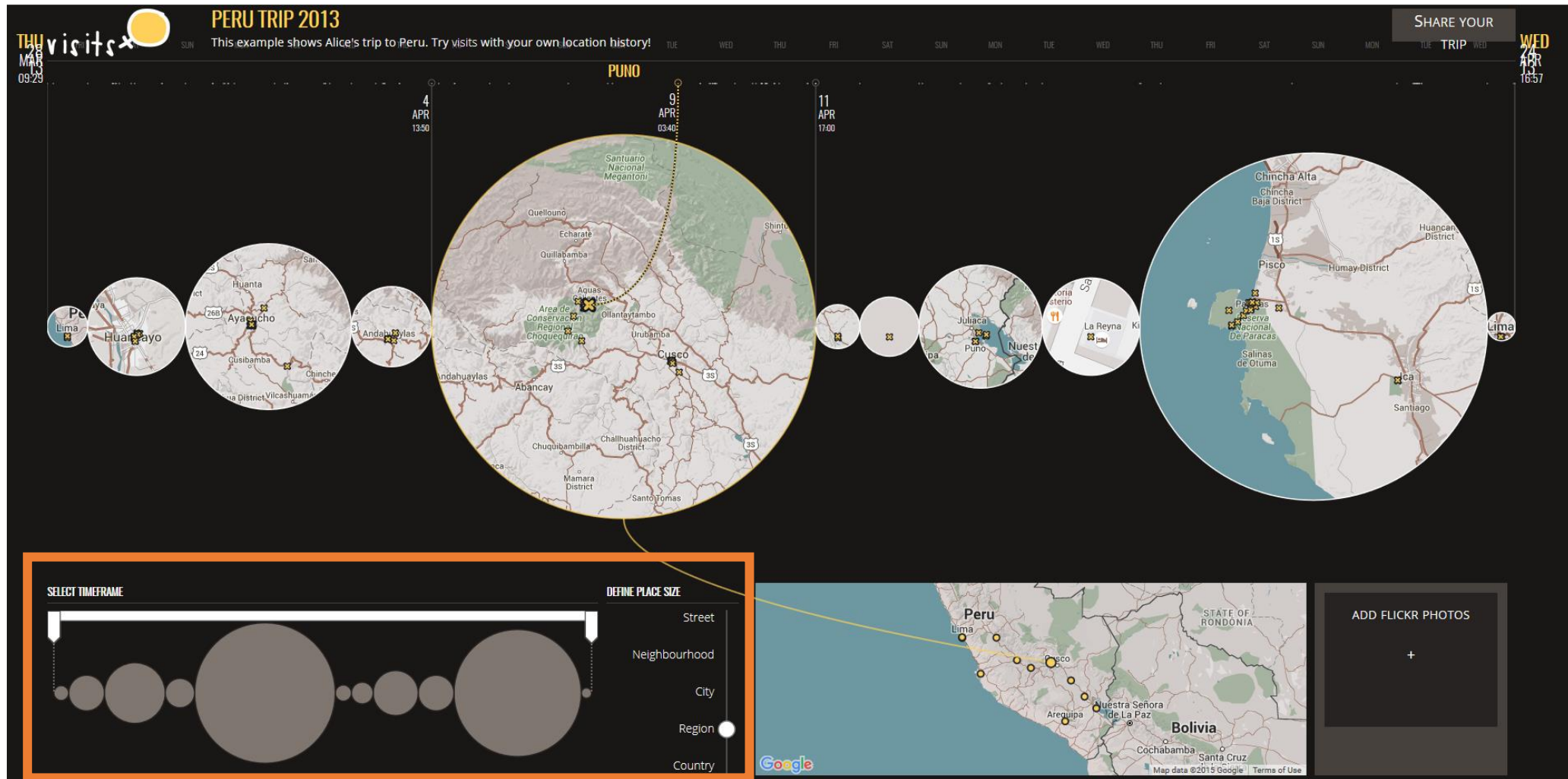
<http://v.isits.in/>

Not for external use



# visits

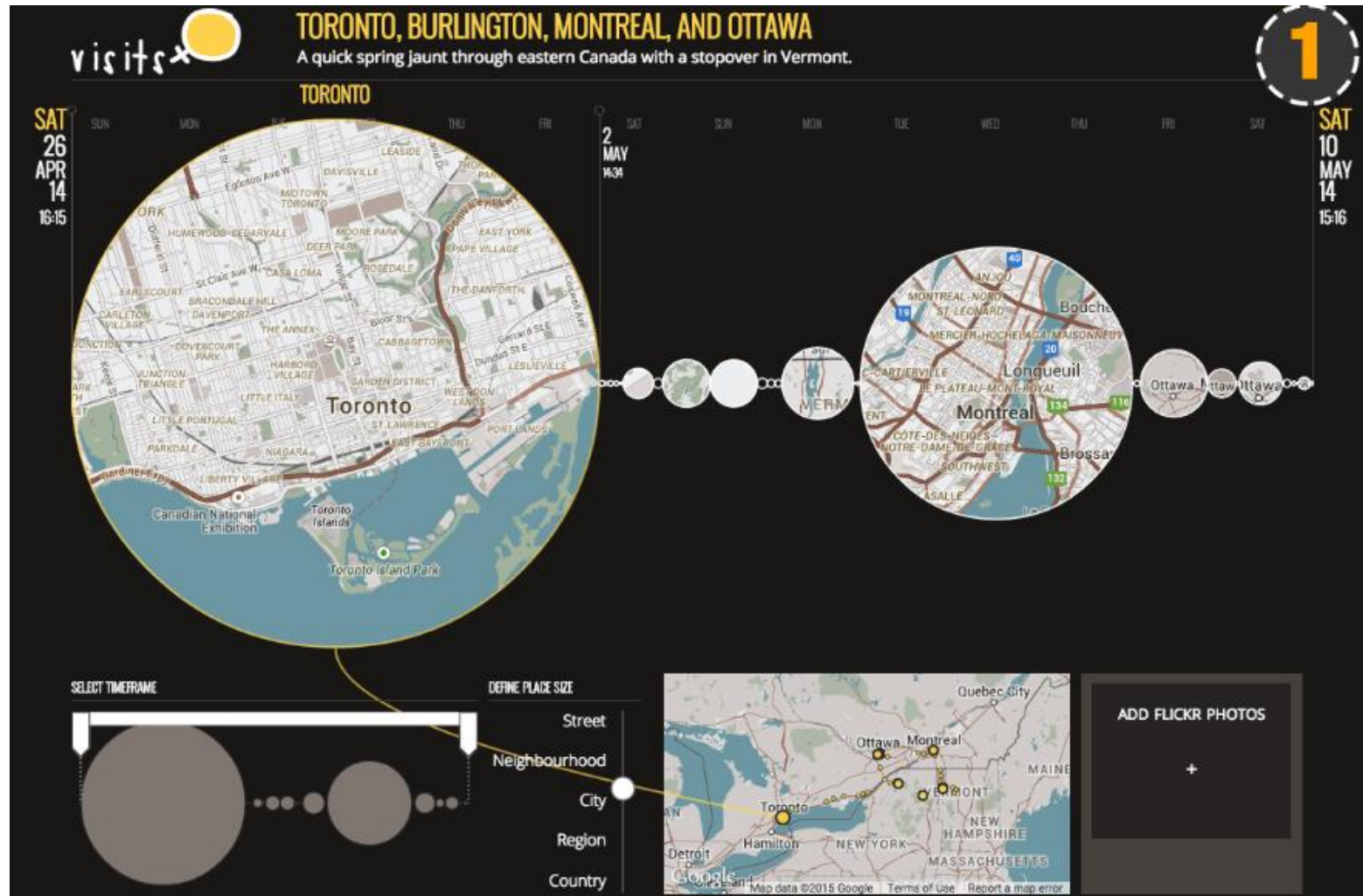
Alice Thudt, Dominikus Baur, Sheelagh Carpendale



<http://v.isits.in/>

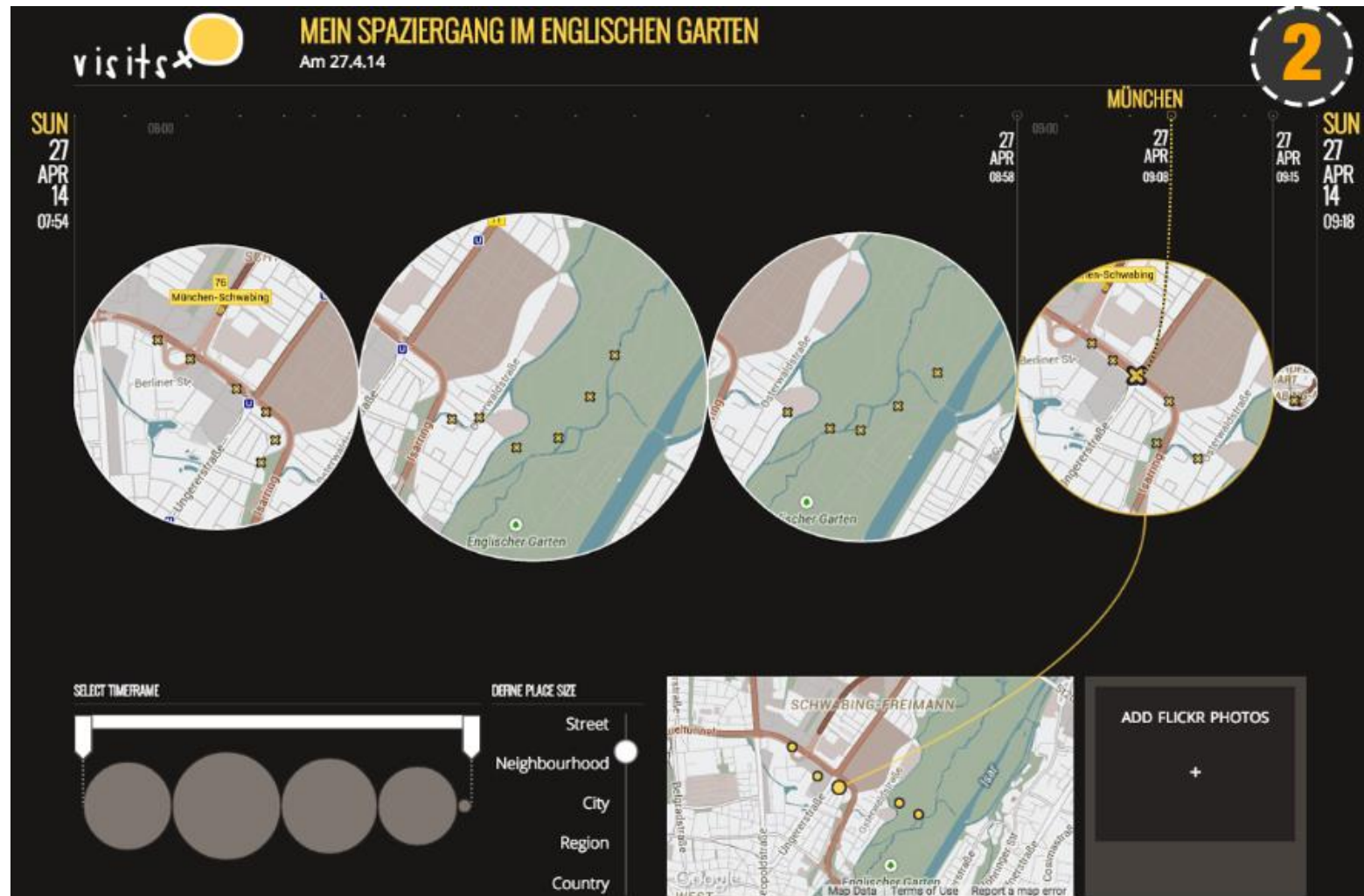
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# mementos of short-term trips



Toronto, Burlington, Montreal and Ottawa

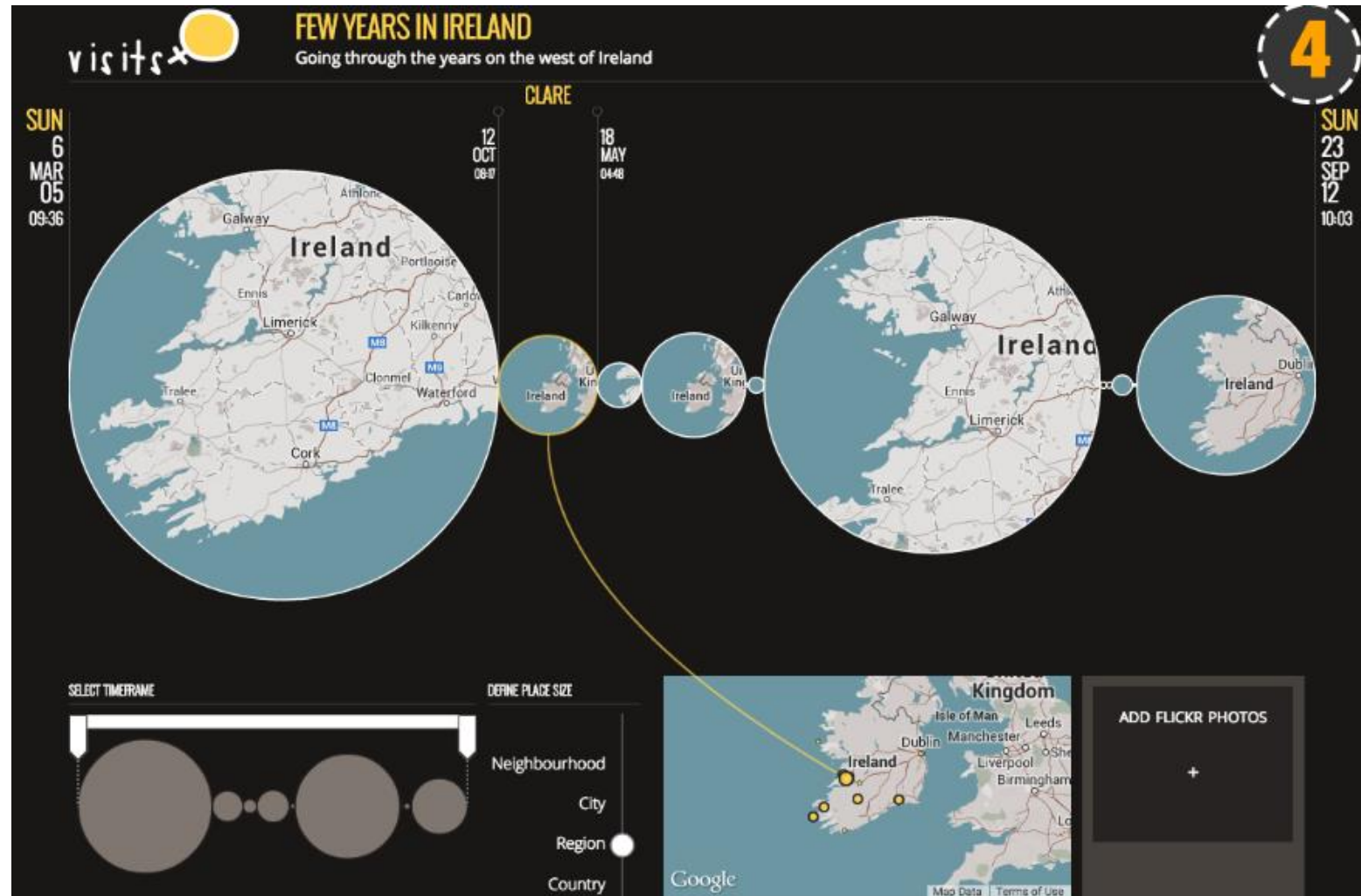
# memento of an activity



Walk through the English garden in Munich.

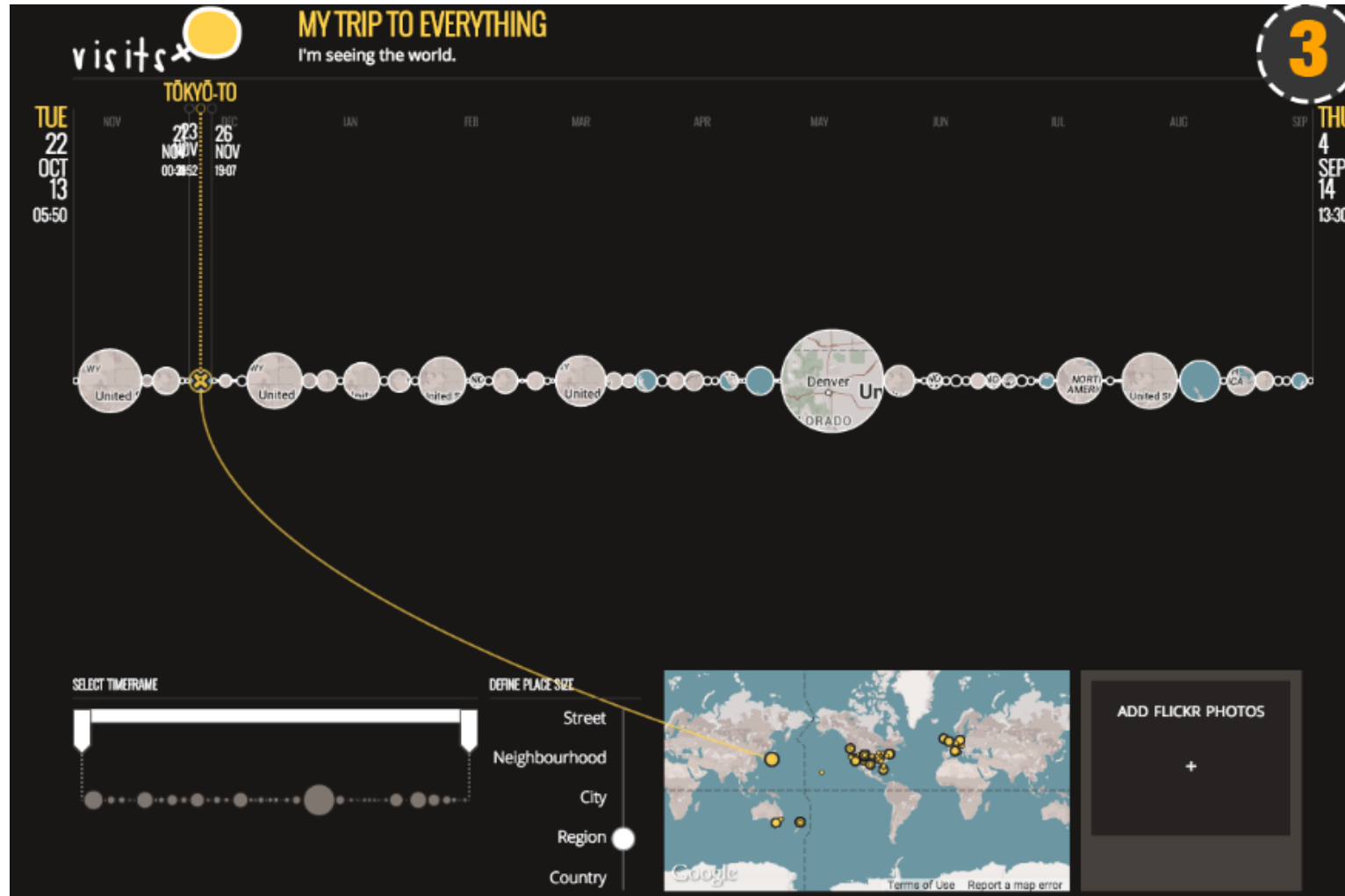


# memento of everyday life



Few years in Ireland – going through the years of the West of Ireland.

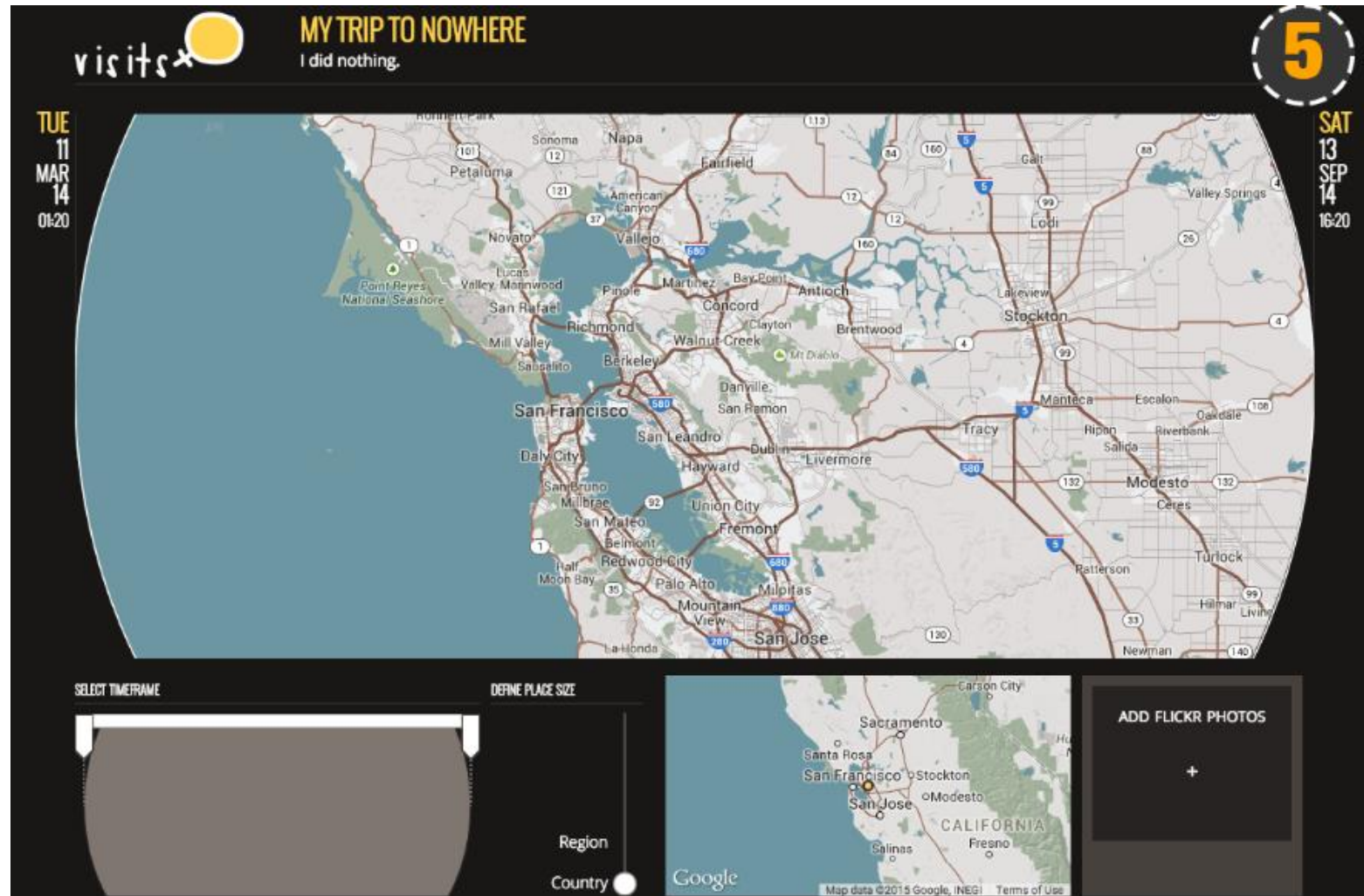
memento of multiple trips



My trip to everything. I am seeing the world.

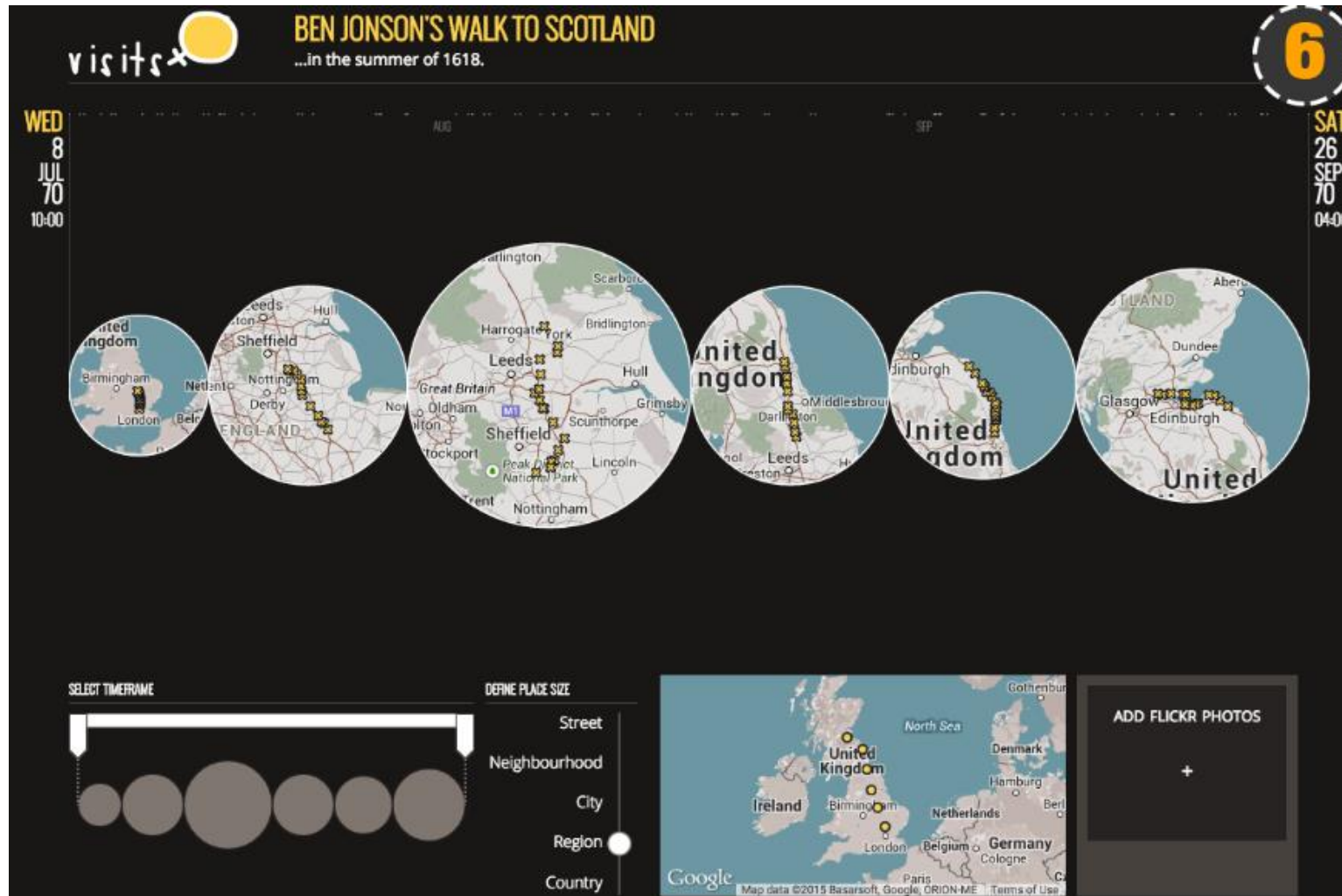


# memento of boredom



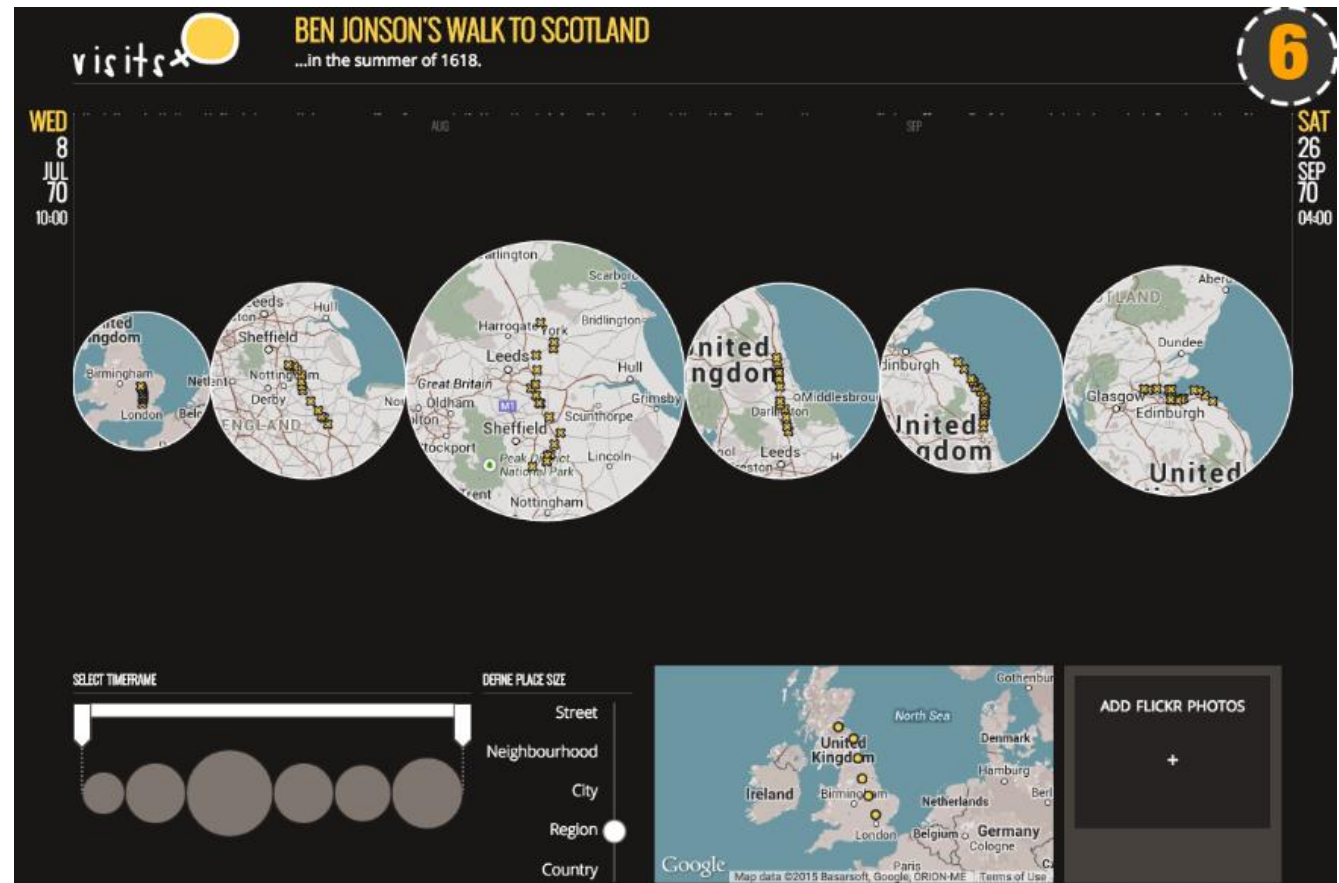
My trip to nowhere. I did nothing.

# historic memento



Ben Jonson's walk to Scotland – in the summer of 1618.

# visual mementos: reflecting memories with personal data



Thudt et al. Visual Mementos: Reflecting Memories with Personal Data. TVCG 2015.

<https://innovis.cpsc.ucalgary.ca/innovis/uploads/Publications/Publications/Visual%20Mementos-CameraReady.pdf>

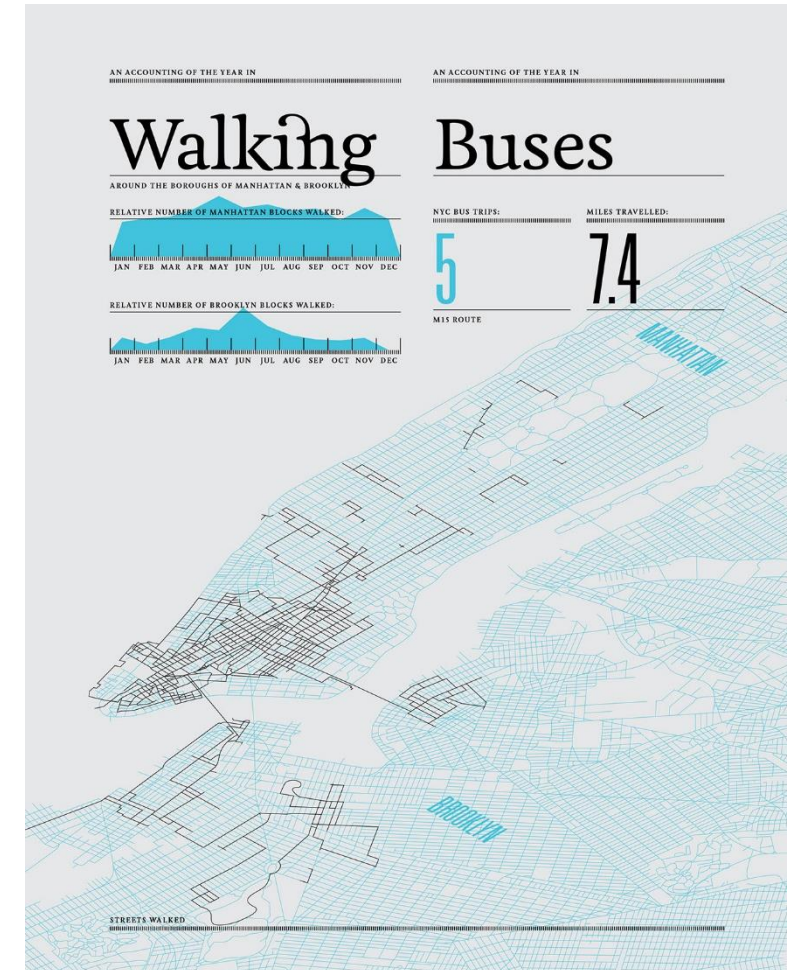
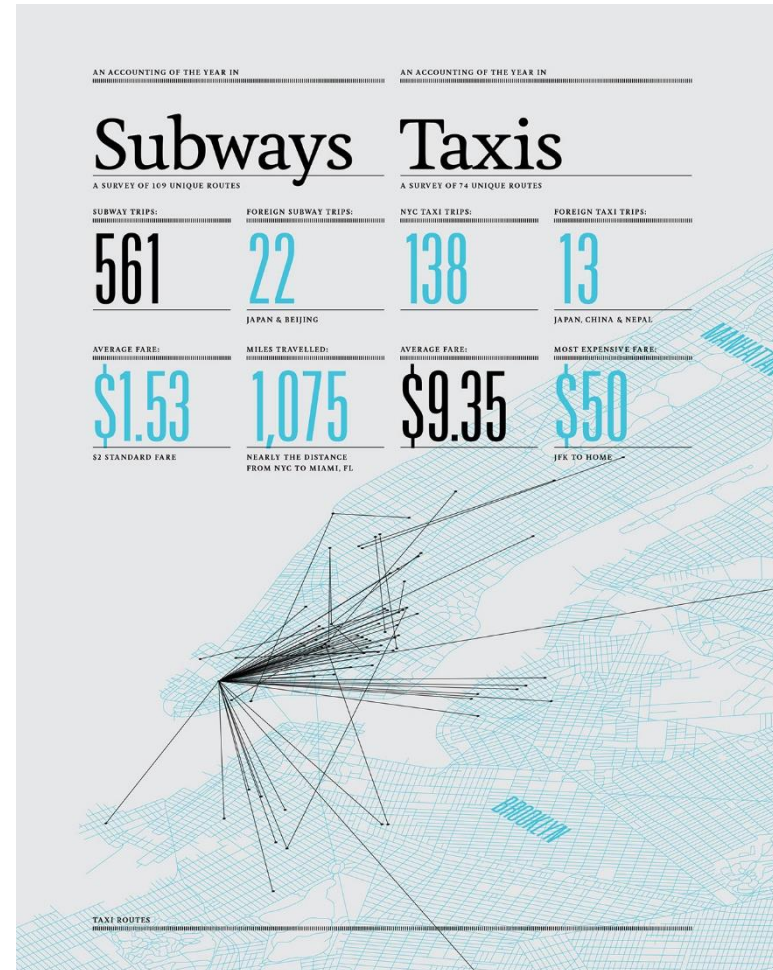
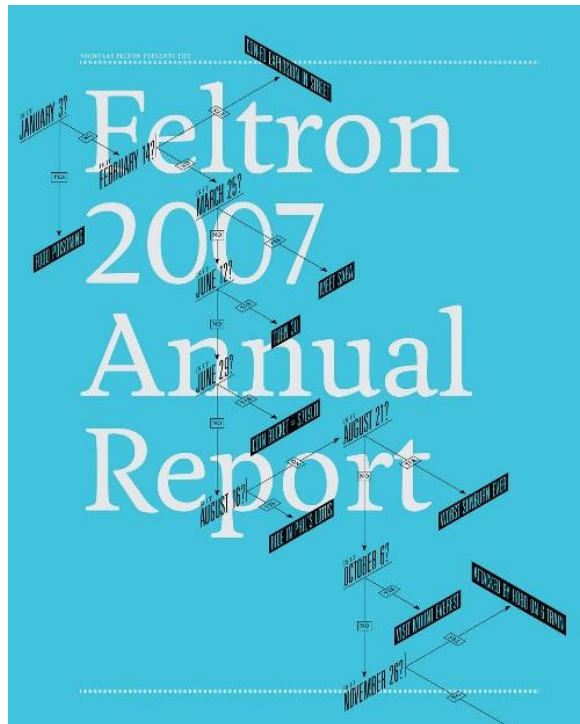
# autobiographical visualizations

personal storytelling



# Feltron annual report

by Nicholas Felton

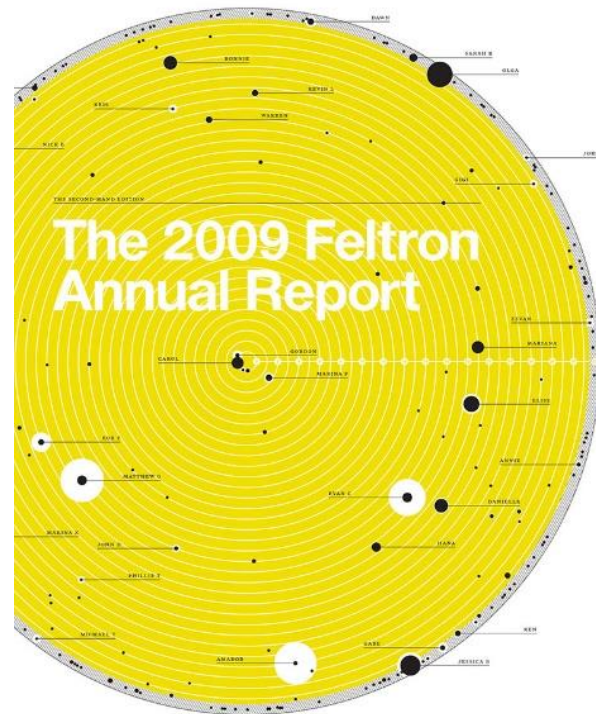


<http://feltron.com/FAR07.html>

Not for external use

# Feltron annual report

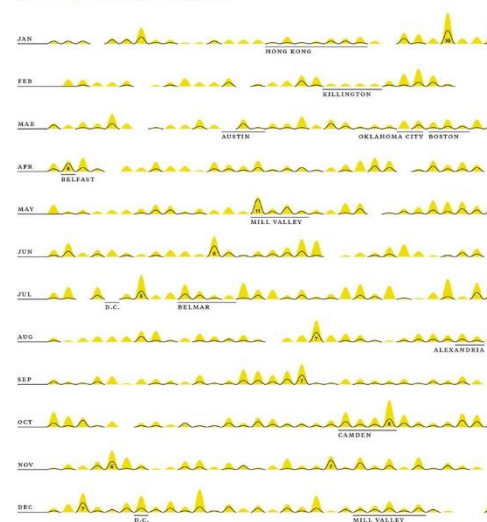
by Nicholas Felton



## Distribution

Date and location of encounters.

FIGURE 1. ENCOUNTERS / RESPONSES



METHODOLOGY

Throughout 2009, friends, family, co-workers and acquaintances of Nicholas Felton were asked to report on his activities whenever they met.

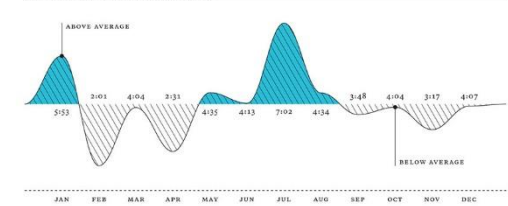
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COUNTRIES INCLUDED	STATES INCLUDED	DAYS WITH REPORTS	CONTRIBUTORS
Three	Nine	254	210
U.S.A., HONG KONG AND NORTHERN IRELAND	CALIFORNIA, MAINE, MASSACHUSETTS, NEW JERSEY, NEW YORK, OKLAHOMA, TEXAS, VERMONT, VIRGINIA, PLUS WASHINGTON D.C.	70% OF THE YEAR	AVERAGE 2.66 REPORTS PER PERSON

## Activities

The length and habits of an encounter.

FIGURE 5. AVERAGE LENGTH OF AN ENCOUNTER



QUESTION 3. APPROXIMATELY HOW LONG WAS YOUR ENCOUNTER?

A total of about 60 minutes.

LORI, JANUARY 7

104M-11PM ON 03/26/09.

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900 seconds.

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3 hours (they always seem to be 3 hours!)

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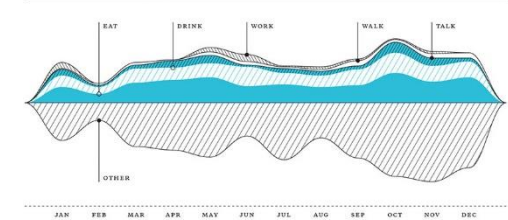
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ANDREW K., AUGUST 19

7 hours 30 minutes.

MARINA F., DECEMBER 24

FIGURE 6. FREQUENTLY REPORTED ACTIVITIES



QUESTION 4. WHAT ACTIVITIES DID YOU AND NICHOLAS PARTICIPATE IN?

Drinking, in a social sense.

KRIS, JANUARY 7

A walk to the peak, riding roller coasters at Ocean Park, browsing for books.

DANIELLE, JANUARY 18

Conversation, light computer use.

NICK S., MARCH 31

Chomp chomp chomp.

GORDON, MAY 18

Ate crabs, drank, watched fireworks, got ice cream.

AARON L., JULY 10

Reviewing work.

MIKE A., AUGUST 12

Waiting for a plane.

GIDEON, OCTOBER 25

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105 REPORTS

MOST ACTIVITIES IN A MONTH

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OCTOBER

DJING TO DANCING RATIO

5:4

AVERAGE ACTIVITIES PER ENCOUNTER

2.3

INSTANCES OF LAUGHTER

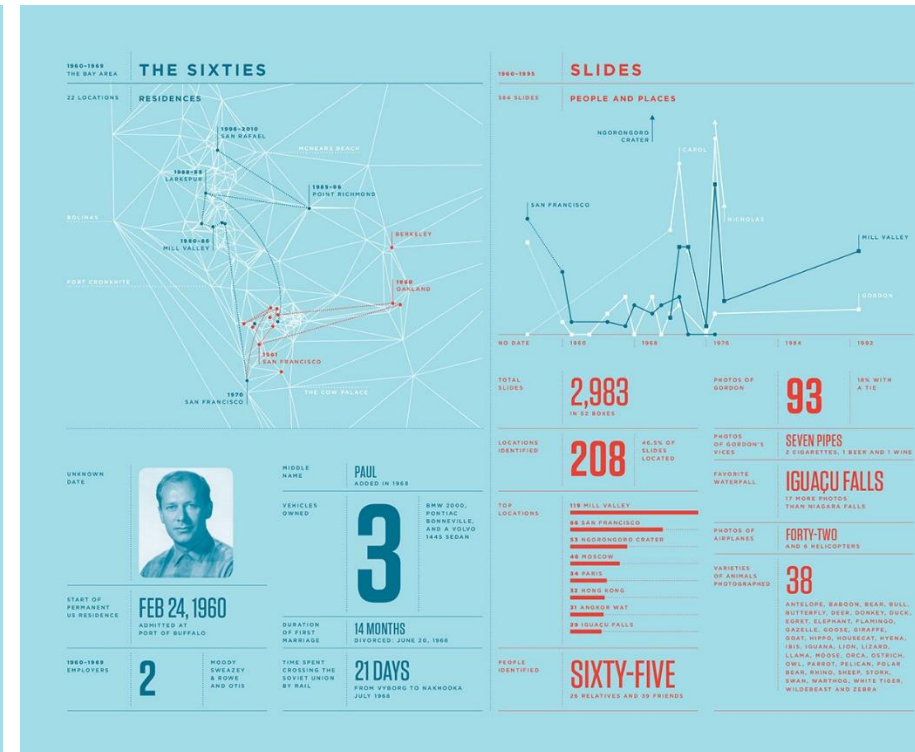
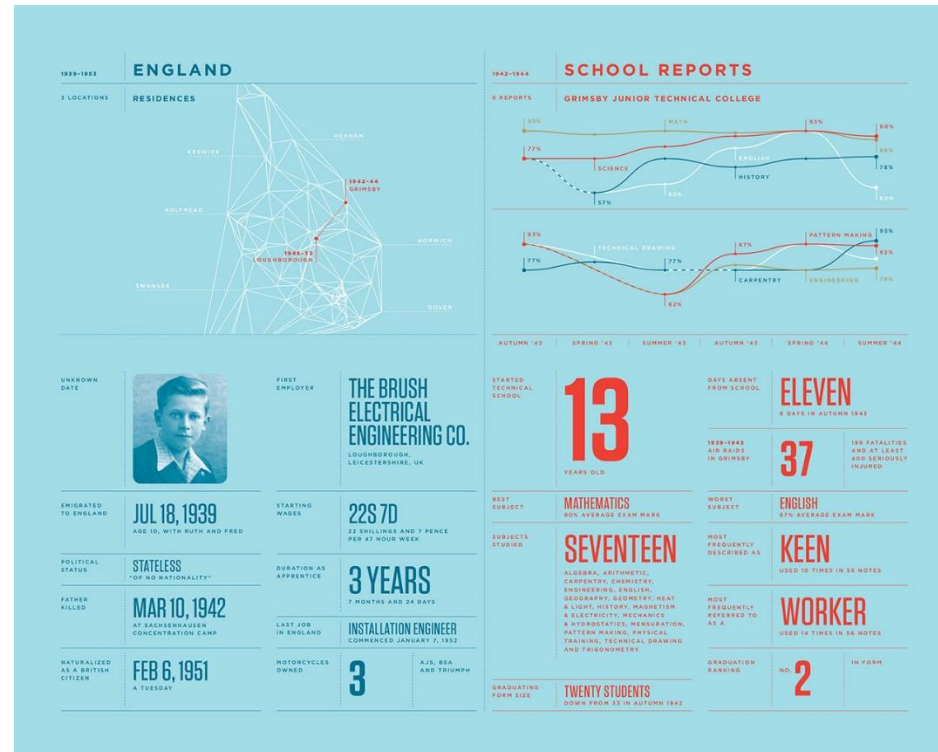
14

<http://feltron.com/FAR09.html>

Not for external use



## by Nicholas Felton



<http://feltron.com/FAR10.html>

# More info on Feltron's process

- Nicholas Felton – Numerical Narratives
  - Eyeo Festival 2011

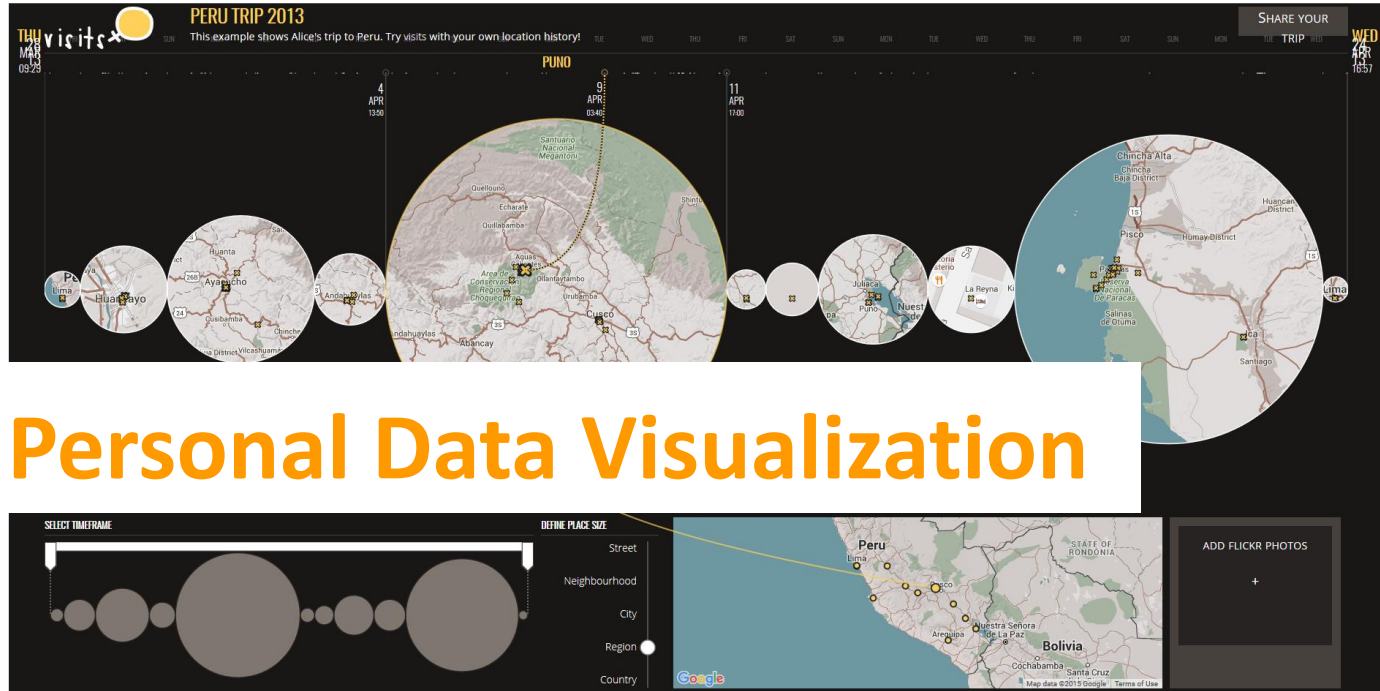


<https://vimeo.com/27800118>



# Session 4.1

## Applications I

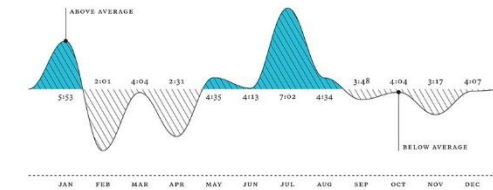


## Personal Data Visualization

## Activities

The length and habits of an encounter.

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10am-11pm on 03/26/09.  
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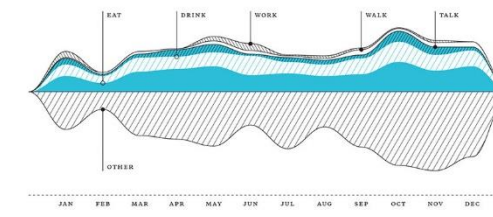
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CHRISTOPHER K, APRIL 2

3 hours (they always seem  
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Personal - 7 mins;  
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WHAT ACTIVITIES DID YOU AND  
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CUMULATIVE REPORTING TIME

Three Months  
99 DAYS, 8 HOURS AND 17 MINUTES

AVERAGE ENCOUNTER LENGTH

Four Hours  
4 HOURS, 15 MINUTES AND 15 SECONDS

DJING TO DANCING RATIO

5:4

AVERAGE ACTIVITIES PER ENCOUNTER

2.3

INSTANCES OF LAUGHTER

14

MOST FREQUENT ACTIVITY

Dinner  
105 REPORTS

MOST ACTIVITIES IN A MONTH

157  
OCTOBER

# Dear Data

Giorgia Lupi & Stefanie Prosavec

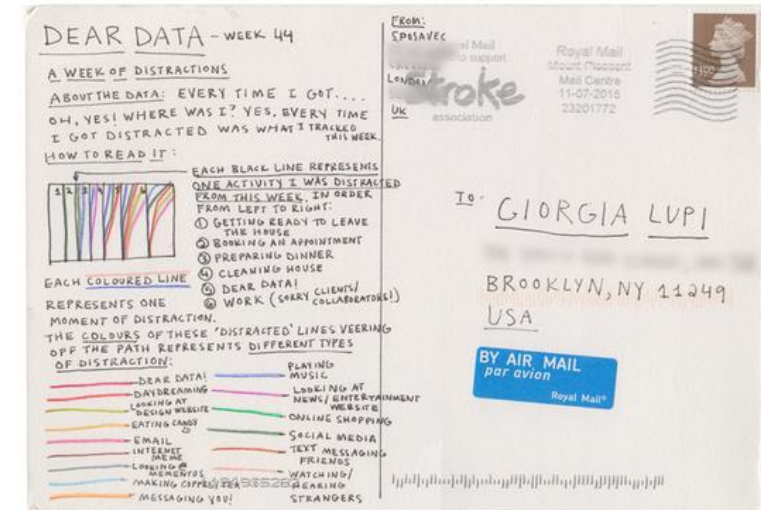
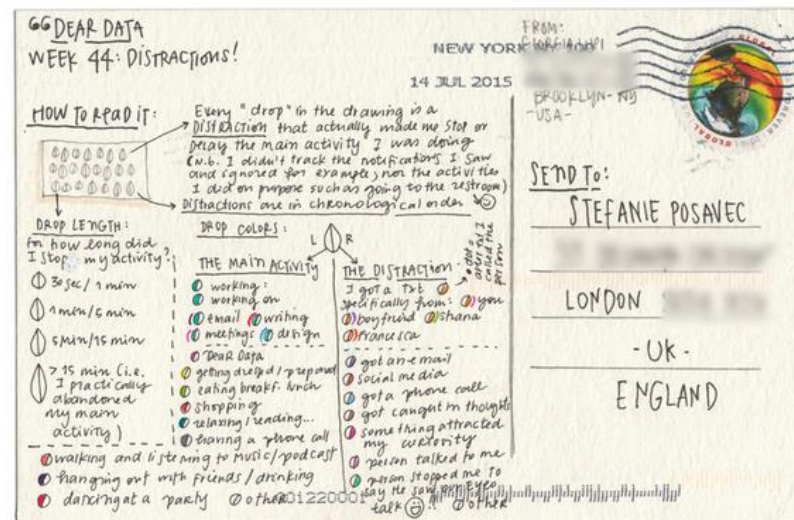
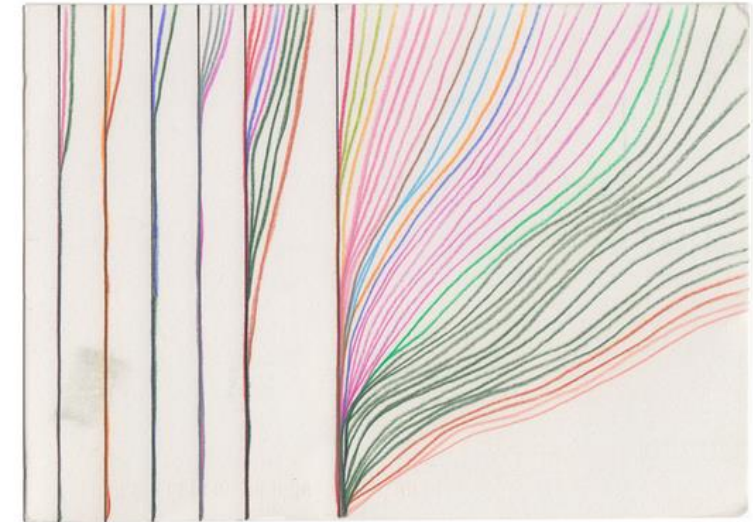


<http://www.dear-data.com>

Not for external use

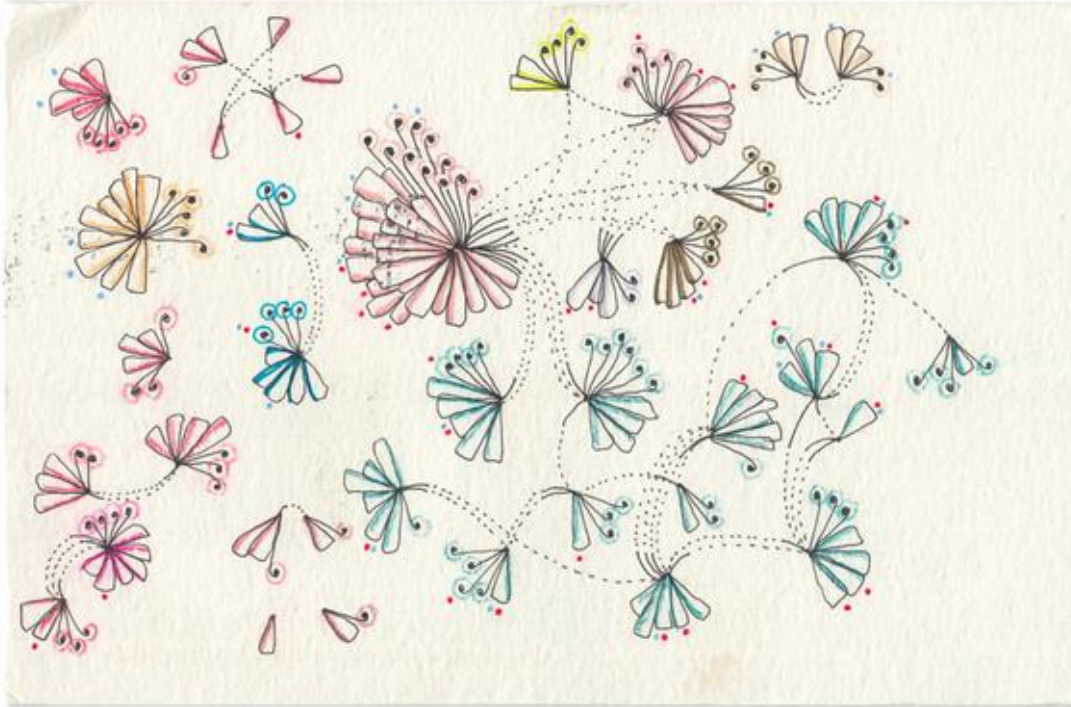


# week 44: a week of distractions



# week 42: a week of laughter

visualization of the week



... we also started this project to show how “data” is not scary, is not necessarily “big”, and that you need to know almost nothing about data to start collecting and representing it (just a pencil, a notebook and a postcard!)



# data humanism

## DATA HUMANISM

~~SMALL~~ ~~big~~ data  
data ~~bandwidth~~ ~~QUALITY~~  
~~IMPERFECT~~ ~~infallible~~ data  
~~SUBJECTIVE~~ ~~impartial~~ data  
~~INSPIRING~~ ~~descriptive~~ data  
~~SERENDIPITOUS~~ ~~predictive~~ data  
data ~~conventions~~ ~~POSSIBILITIES~~  
data to ~~simplify~~ complexity / ~~DEPICT~~  
data ~~processing~~ ~~DRAWING~~  
data driven design  
~~SPEND~~ ~~save~~ time with data  
data is ~~numbers~~ ~~PEOPLE~~  
data will make us more ~~efficient~~ ~~HUMAN.~~

Giorgia Lupi

<http://giorgialupi.com/data-humanism-my-manifesto-for-a-new-data-world>

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