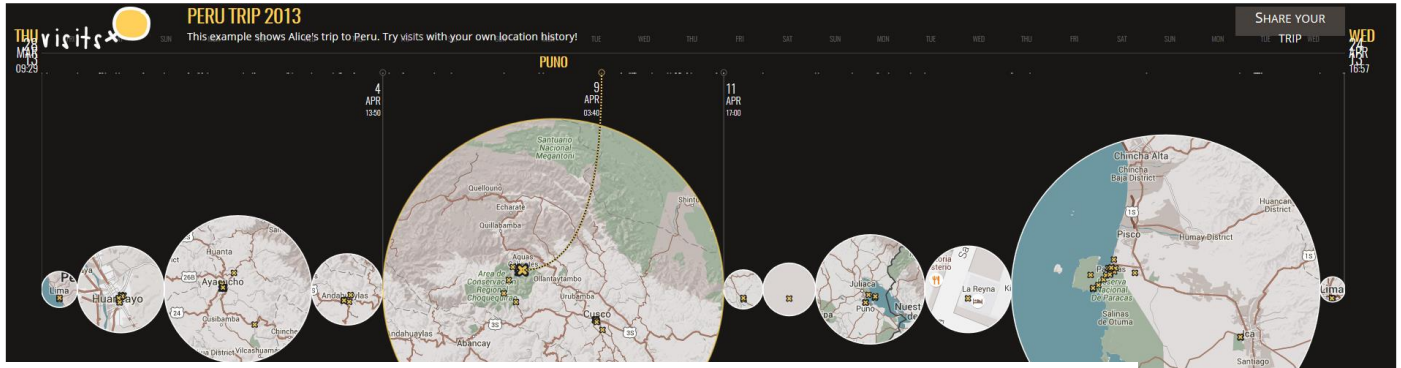
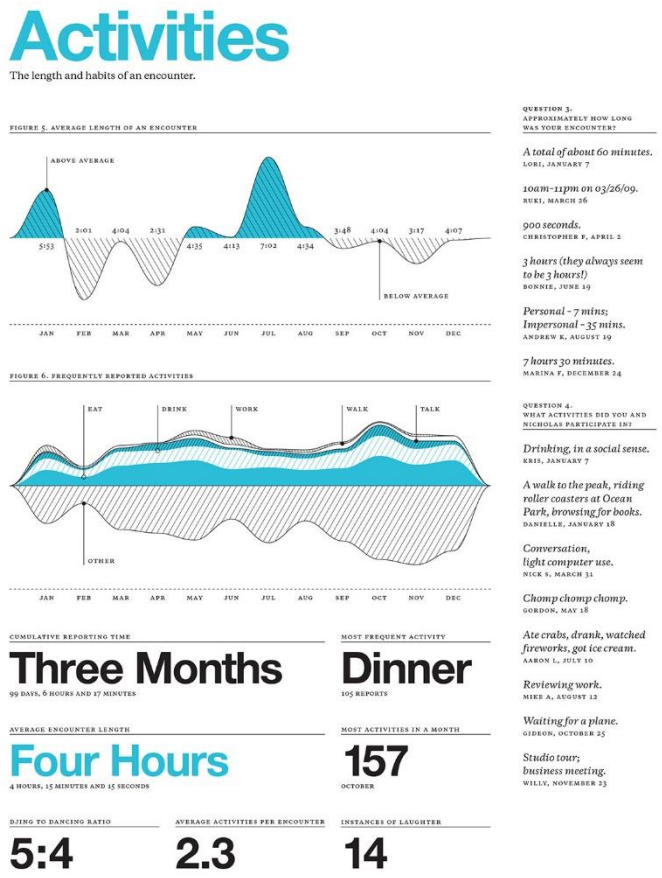
Session 4.1
Applications I



Personal Data Visualization



Online Course
Data Visualization for Professionals

THE UNIVERSITY of EDINBURGH

Uta Hinrichs
July 2020
https://sachi.cs.st-andrews.ac.uk/people/faculty/
https://datavis-online.github.io

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.cpsc.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

OECD Better Life Index
www.oecdbetterlifeindex.org/

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

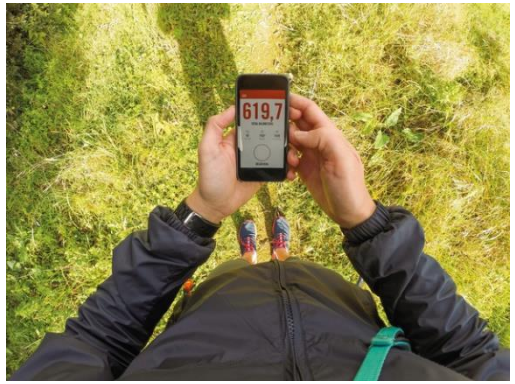
“traditional” vs. personal InfoVis

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_supp/full/527S12a.html

personal visualization – guiding questions

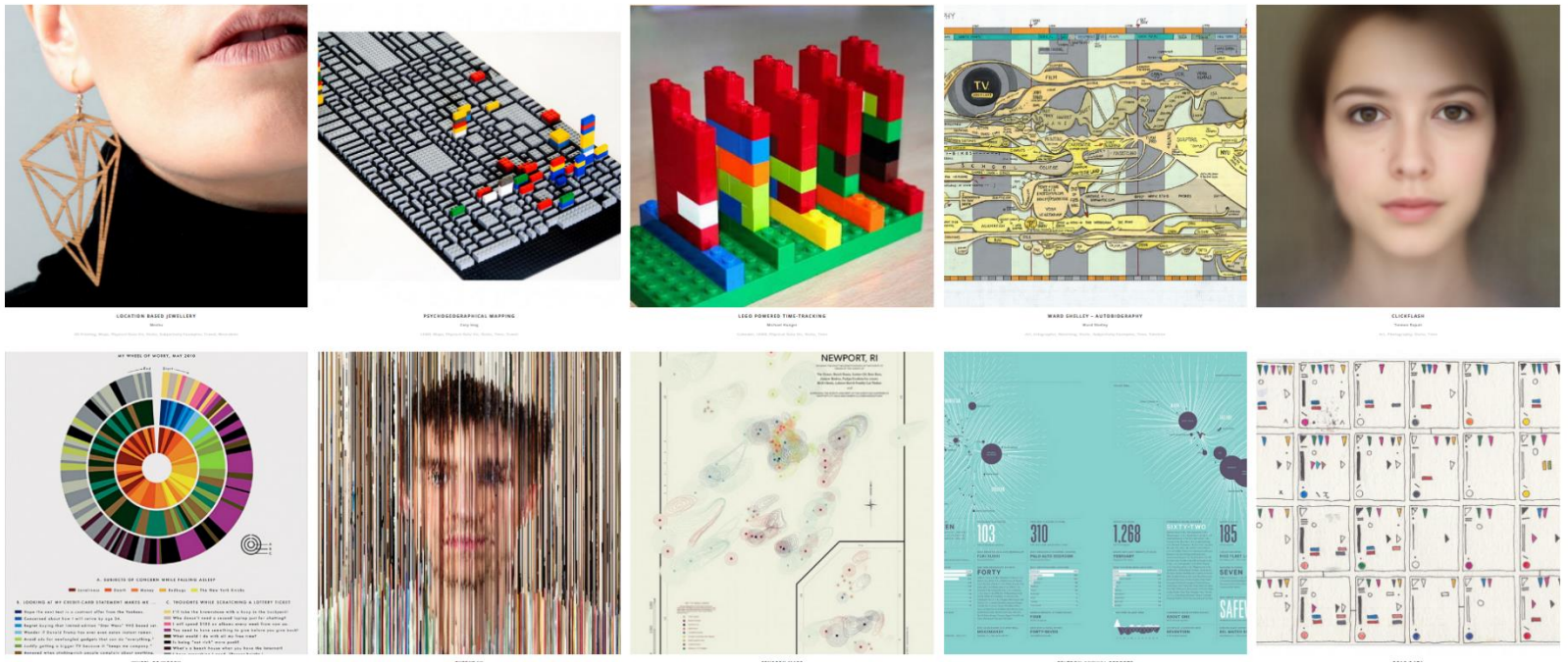
- How can the power of visualization be made appropriate for use in personal contexts – including people who have little experience with data, visualization, or statistical reasoning?
- How can we visually represent data to make positive changes in our personal lives and the lives of others?
- How can 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

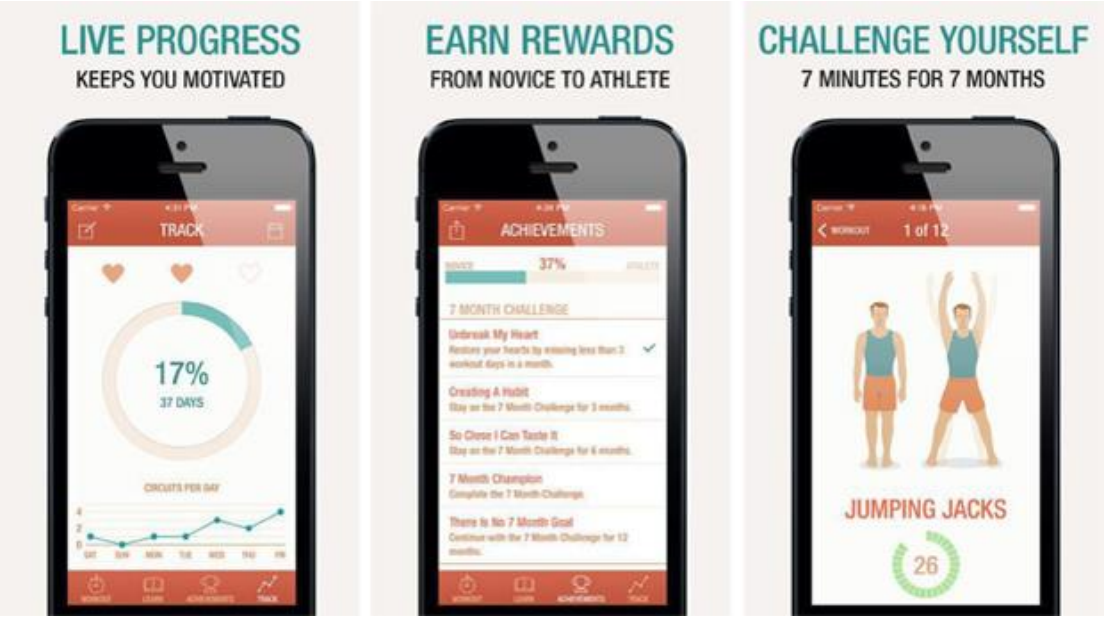
- Residential energy consumption
- Fitness
- Personal health
- Social networks
- Life logging
- Personal finance
- Recycling behaviour
- Commuting
- …



http://vis4me.com/

general applications areas

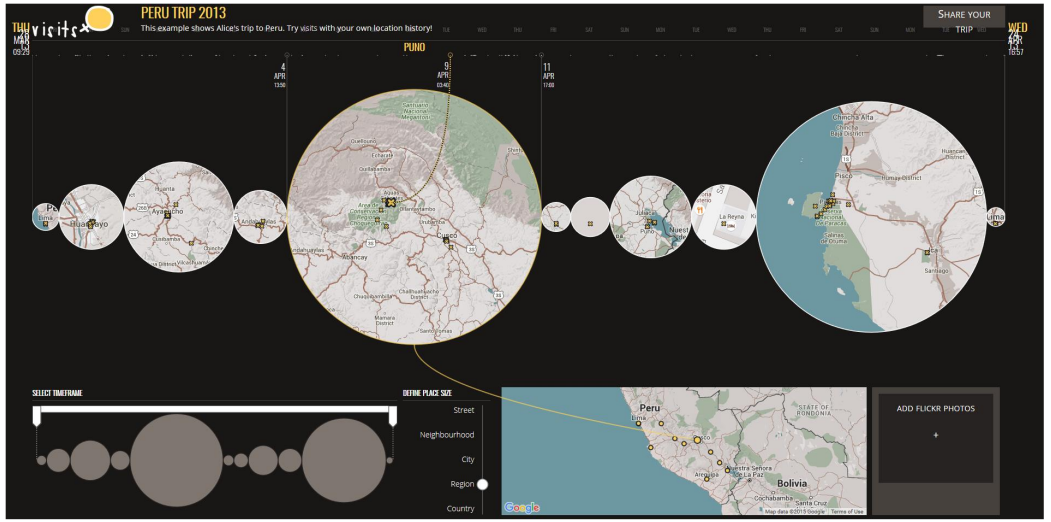
- Supporting awareness for action
  - Goals
    - Self/life improvement
    - Providing awareness of patterns for immediate action



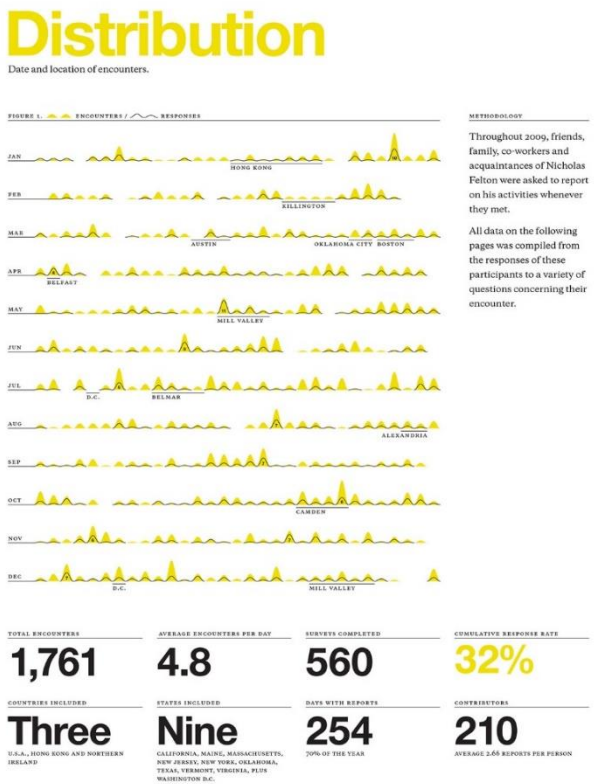
general applications areas

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

  → Autobiographical visualization



http://v.isits.in/



http://feltron.com/FAR09.html

supporting awareness for action

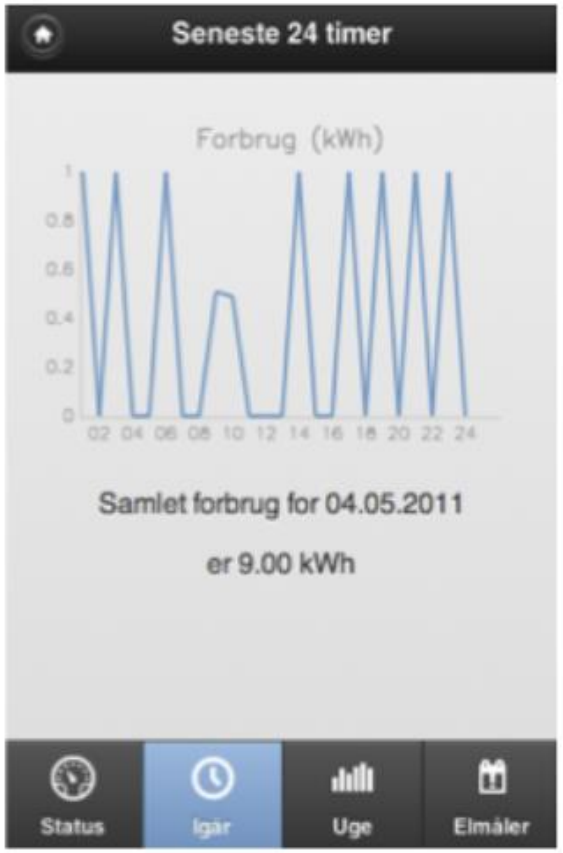
visualization to reduce water consumption

- 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

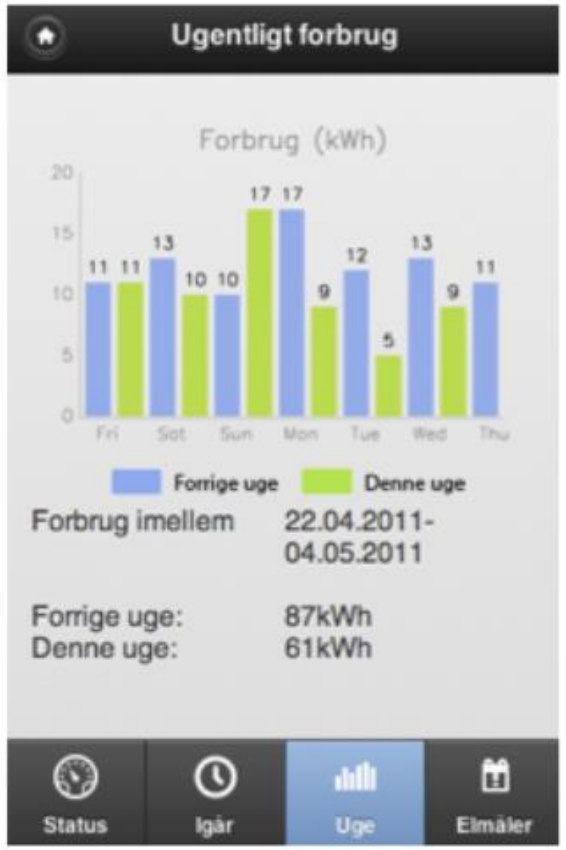
S. Kuznetsov and E. Paulos. UpStream: Motivating Water Conservation with Low-Cost Water Flow Sensing and Persuasive Displays, CHI 2010

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

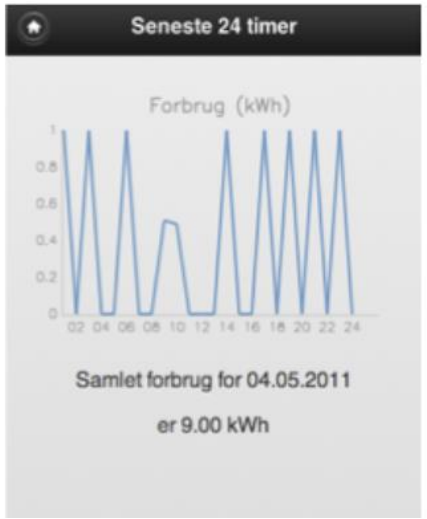
supporting awareness for action – design considerations

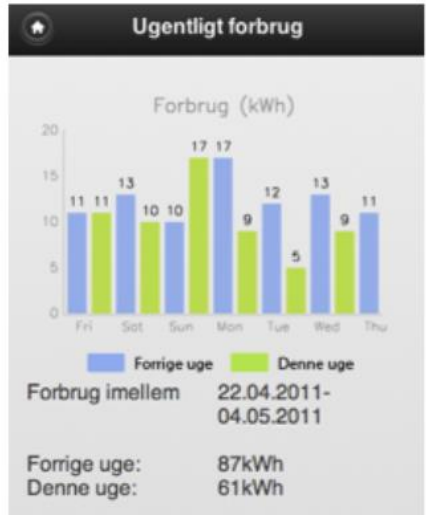
- Easy access to information
  - →Visualization on mobile technology
- Awareness via visualization + tailored information
- Importance of benchmark values/view
  - Previous energy consumption
  - Average energy consumption in comparable households
  - Energy consumption of other households in the neighborhood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

J. Kjieldskov, 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

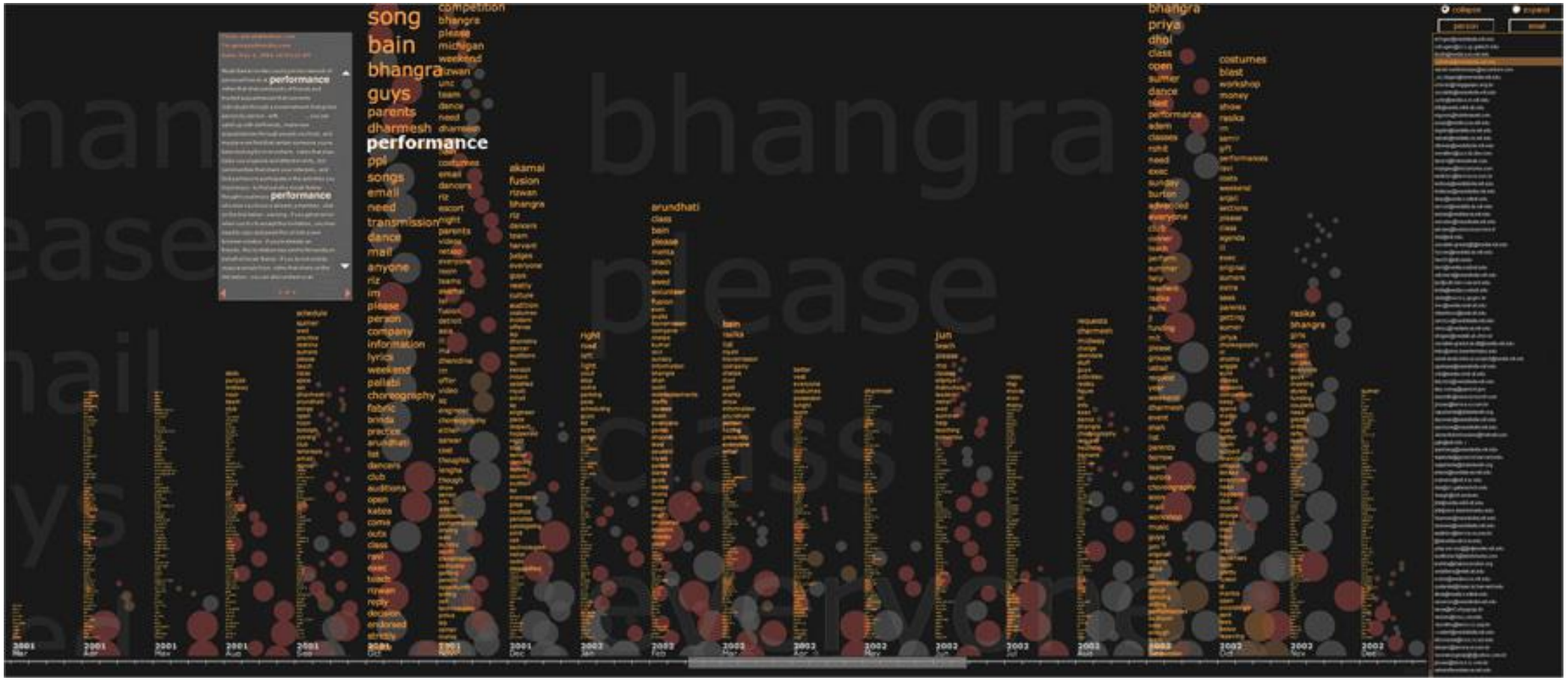
autobiographical visualizations

- 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

email history

Fernanda Viégas



themail

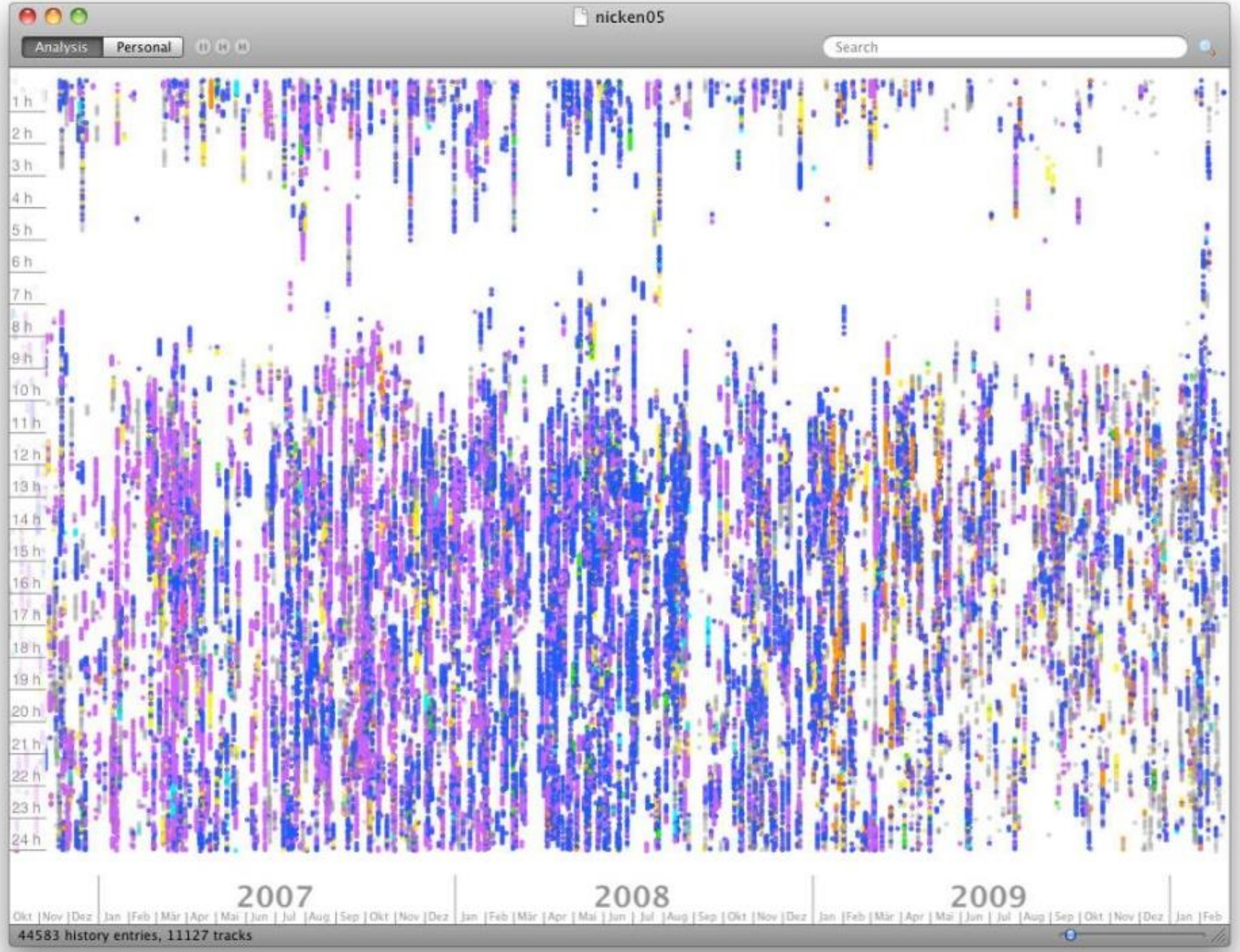
http://fernandaviegas.com/themail/

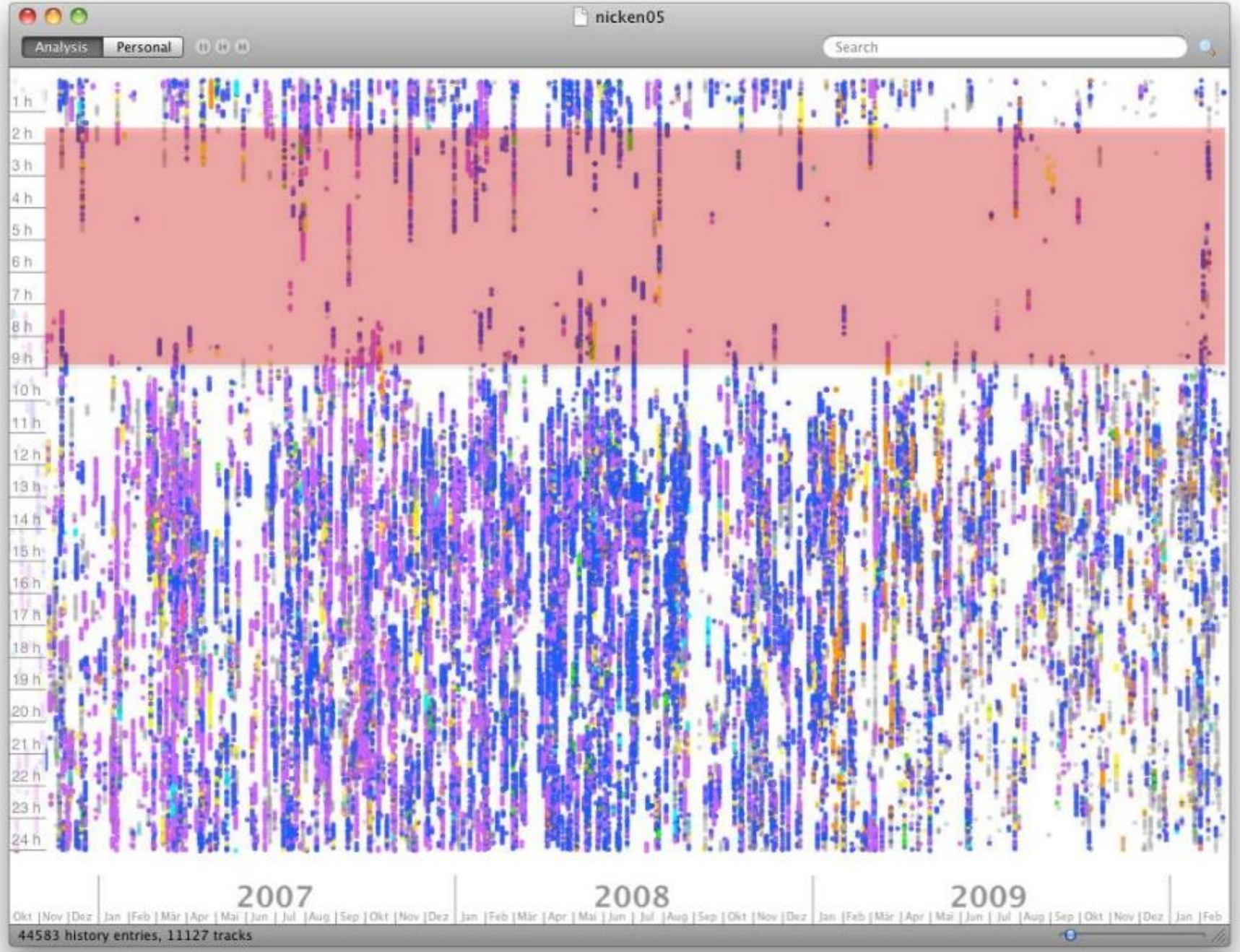
http://smg.media.mit.edu/papers/Viegas/themail/viegas_themail.pdf

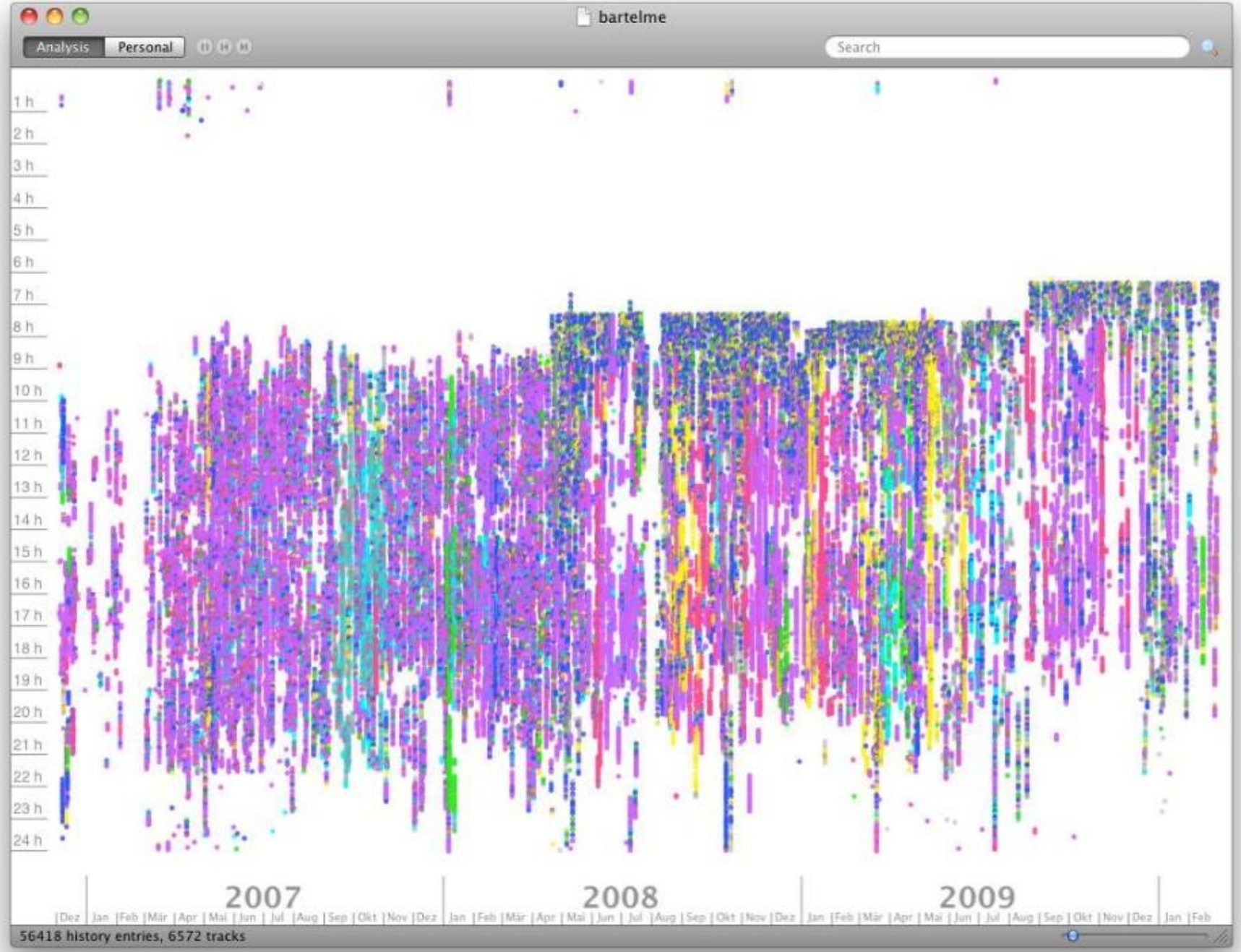
streams of our lives

Dominikus Baur, Frederik Seiffert, Michael Sedlmair, Sebastial Boring

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



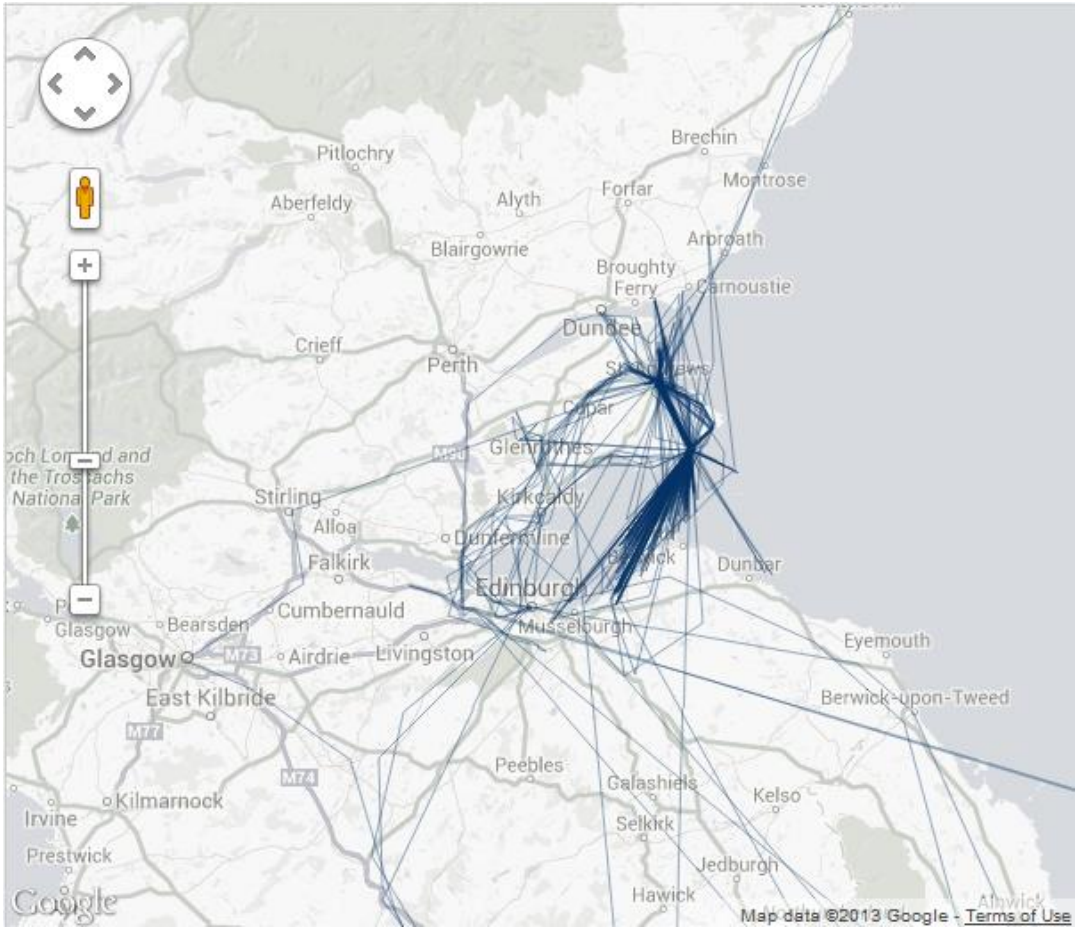




visits

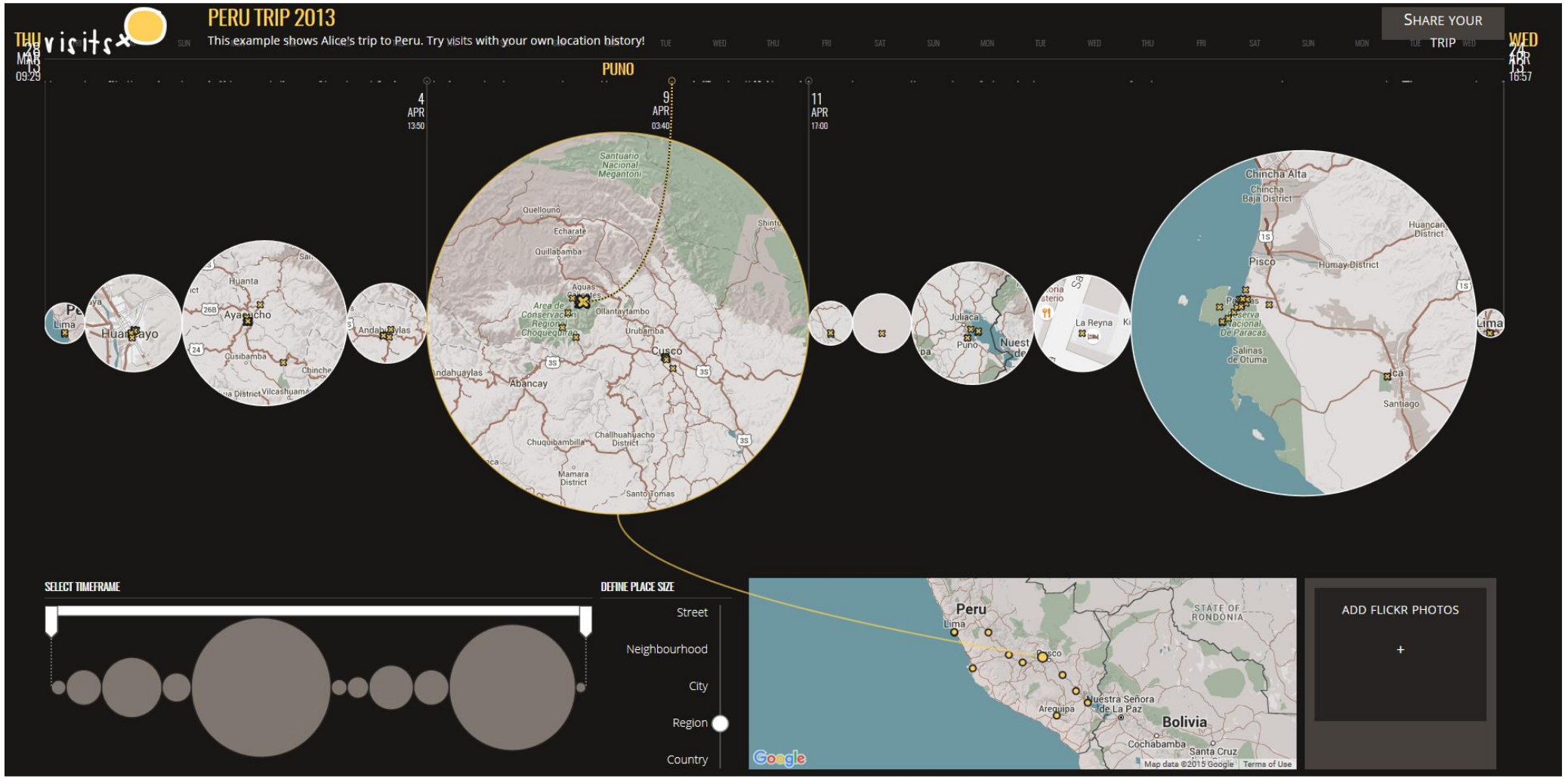
Alice Thudt, Dominikus Baur, Sheelagh Carpendale

- Shows personal location histories
  - Time + geospatial information



visits

Alice Thudt, Dominikus Baur, Sheelagh Carpendale



http://v.isits.in/

visits

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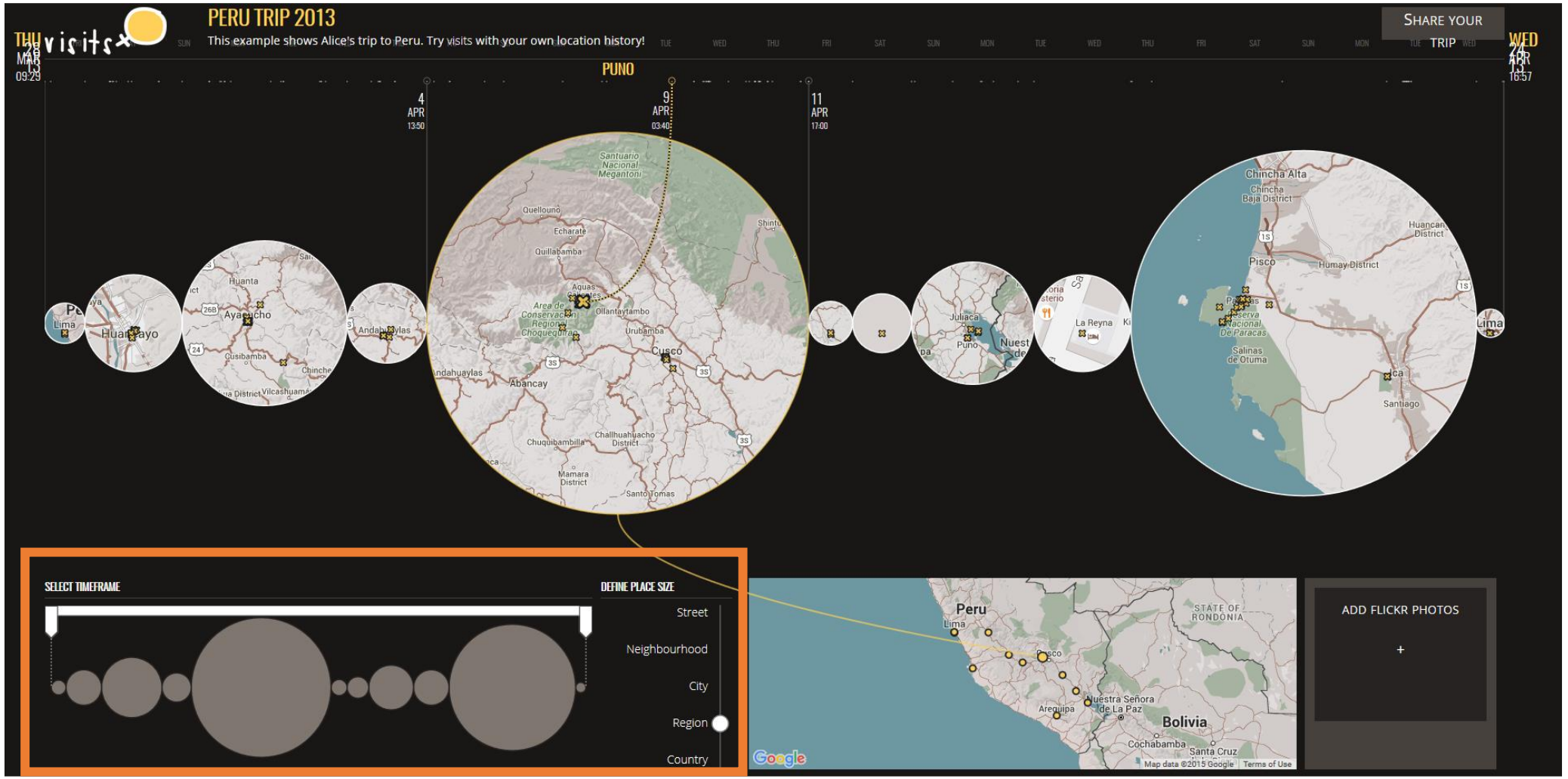
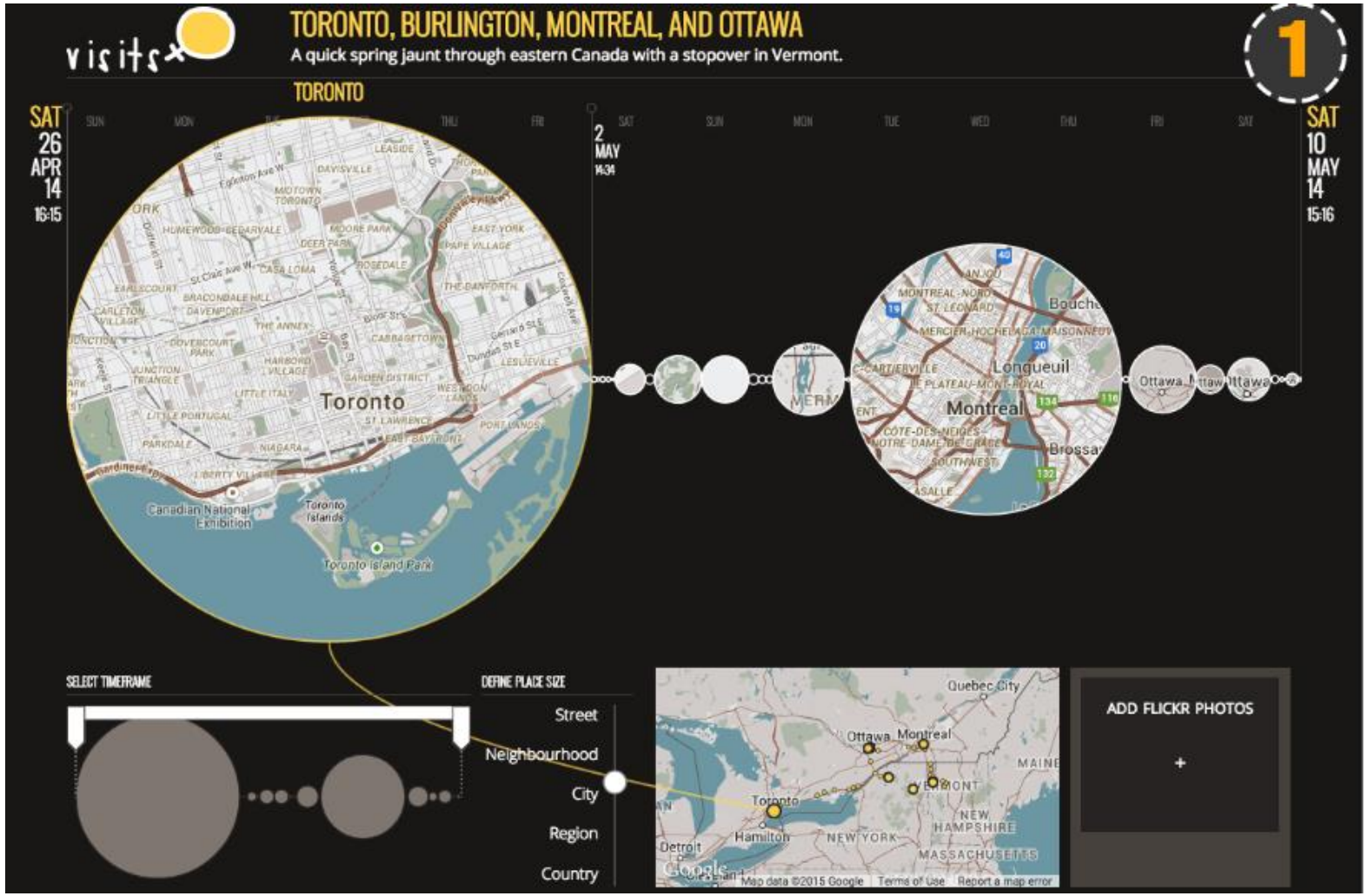


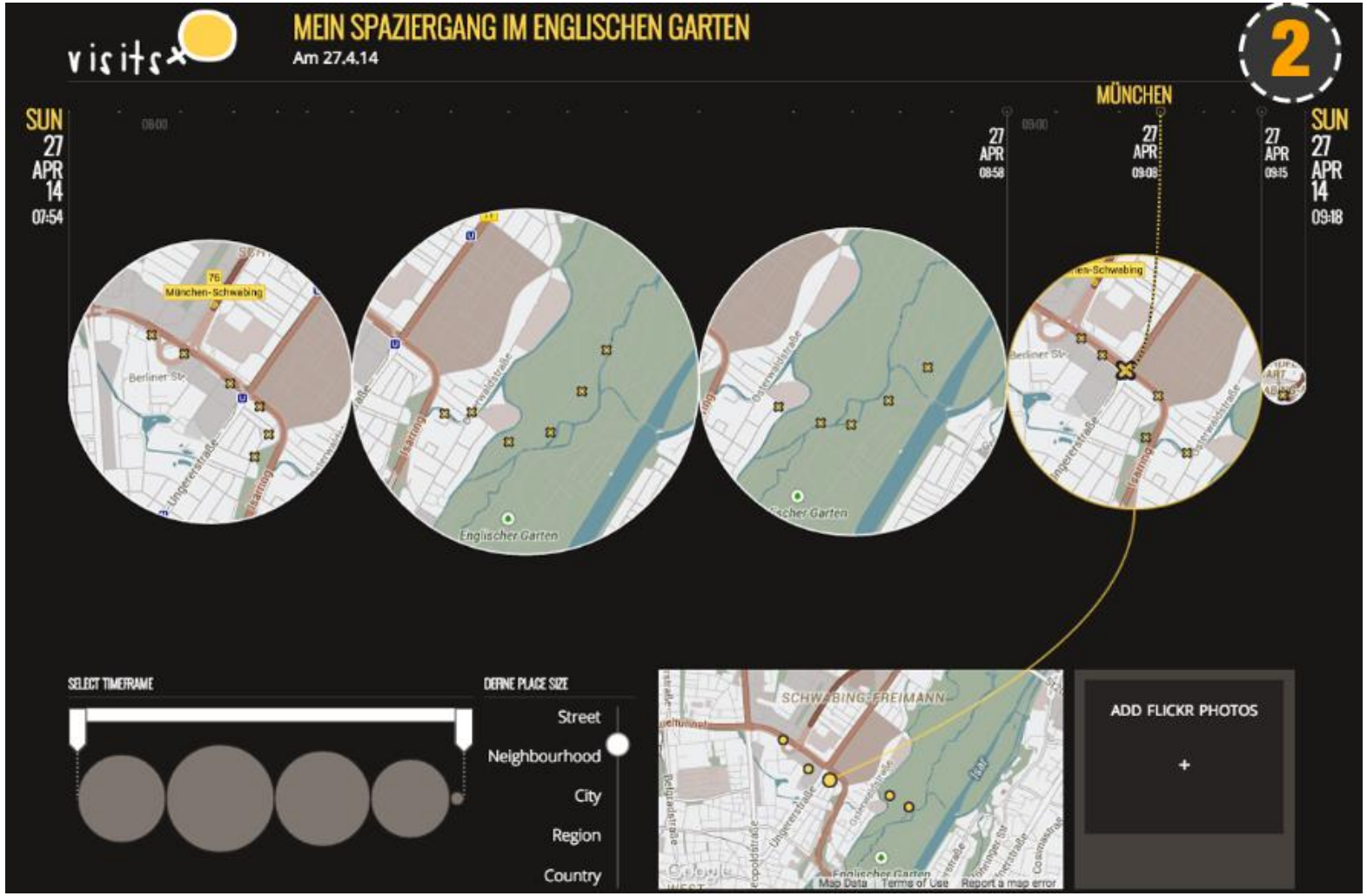
http://v.isits.in/

mementos of short-term trips



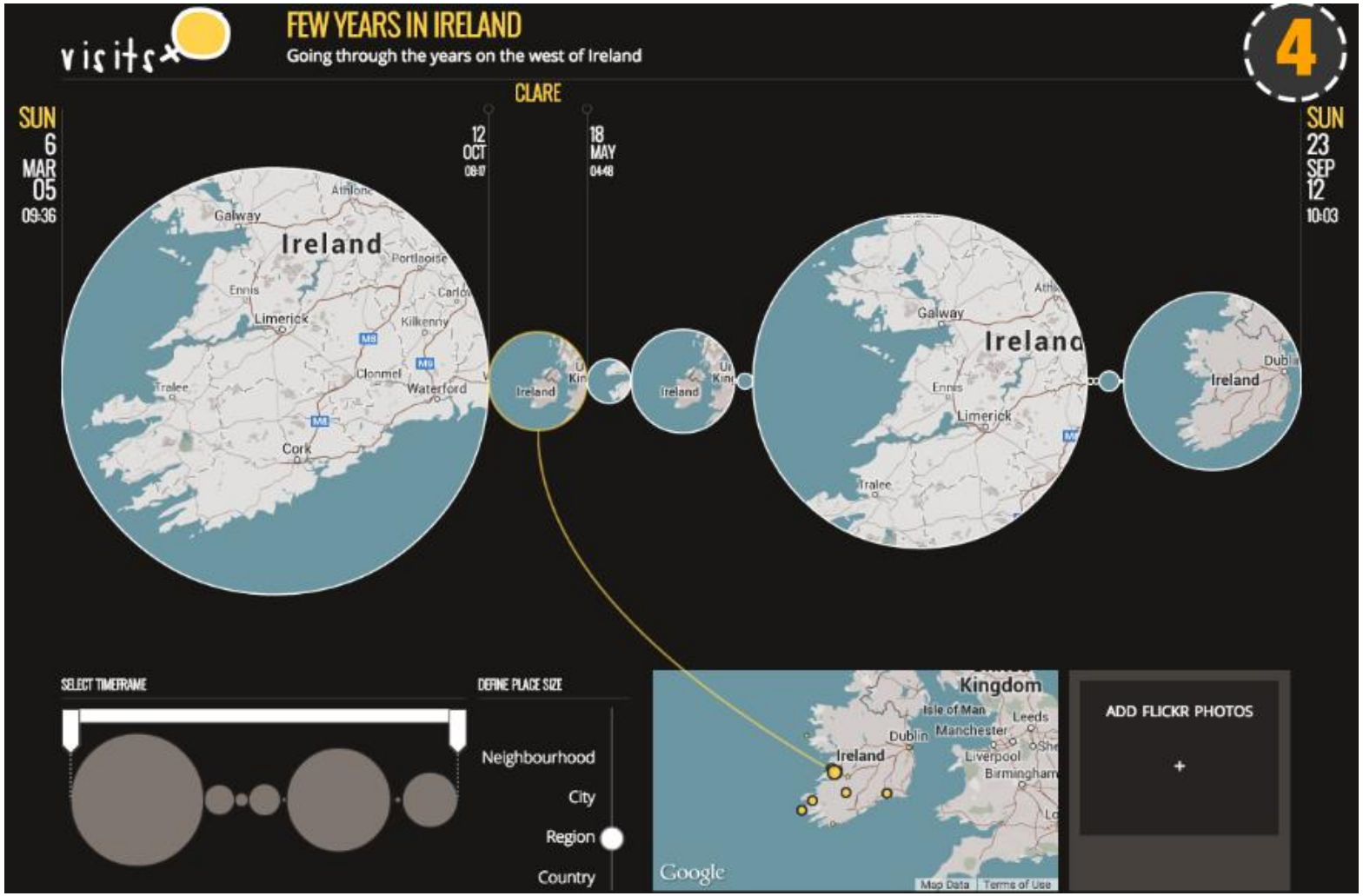
Toronto, Burlington, Montreal and Ottawa

memento of an activity



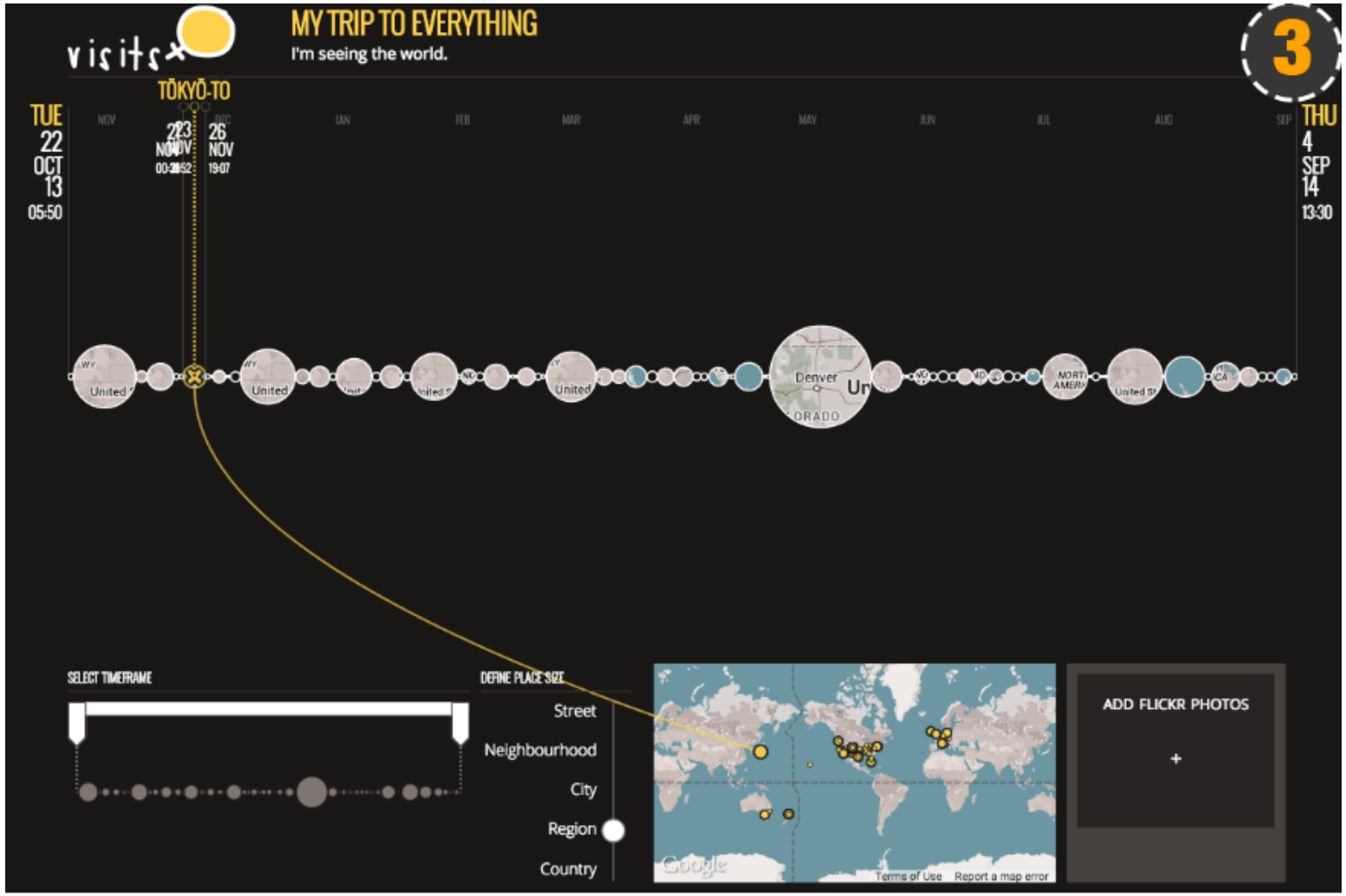
Walk through the English garden in Munich.

memento of everyday life



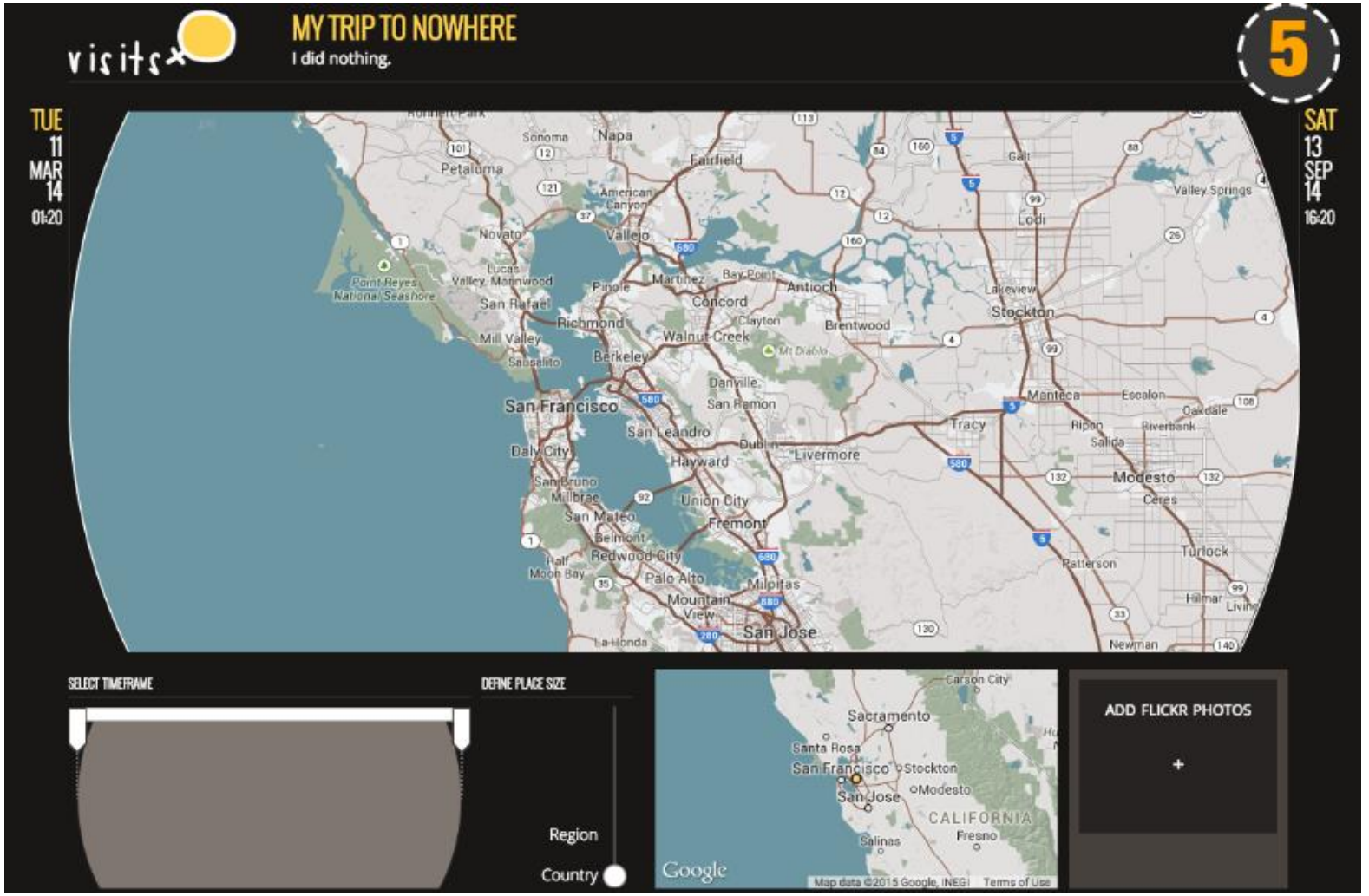
Few years in Ireland – going through the years of the West of Ireland.

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

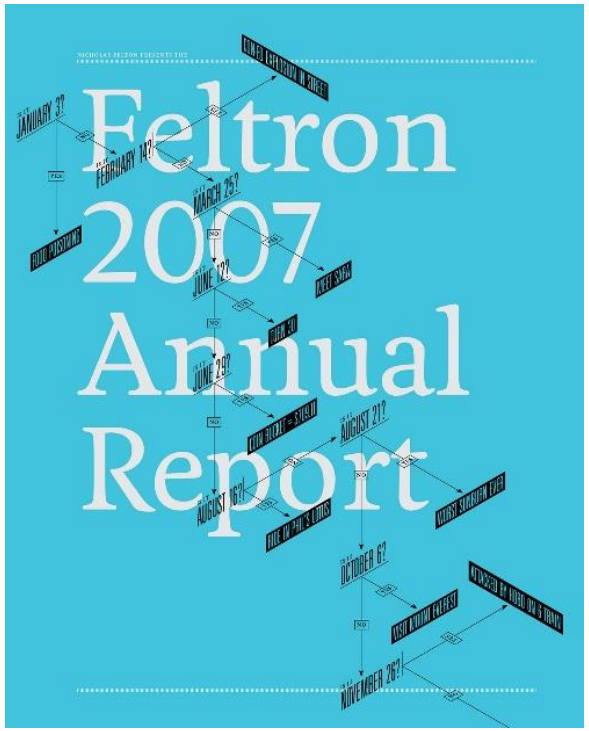
Thudt et al. Visual Mementos: Reflecting Memories with Personal Data. TVCG 2015.
https://innovis.cpsc.ucalgary.ca/innovis/uploads/Publications/Publications/Visual%20Mementos-CameraReady.pdf

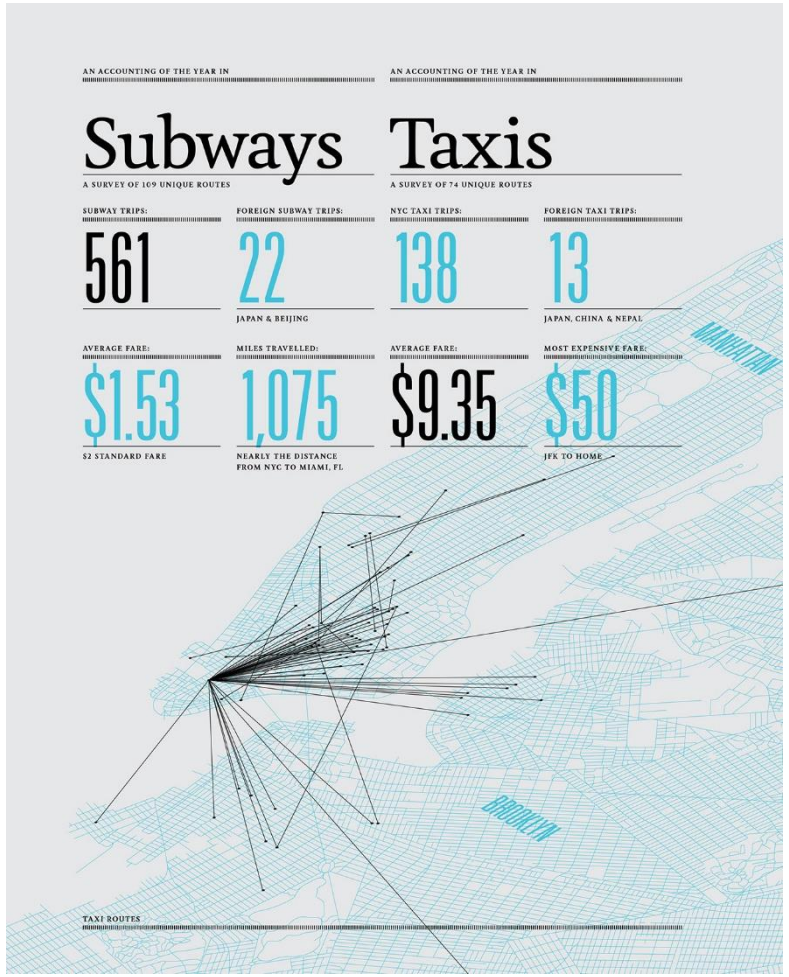
autobiographical visualizations

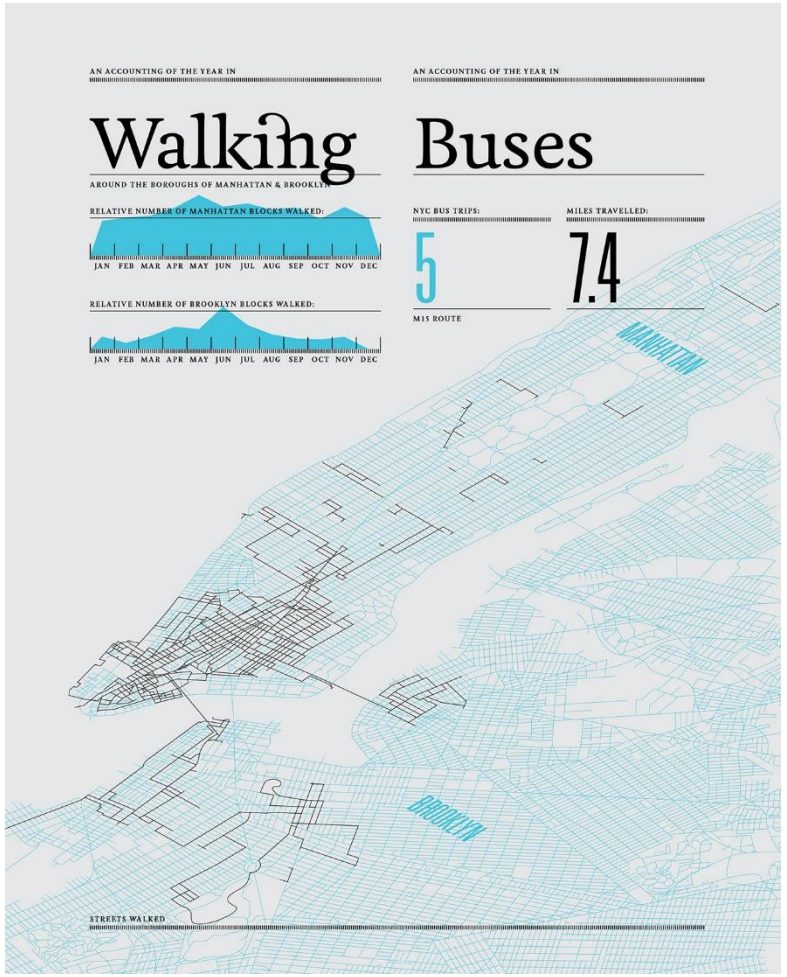
personal storytelling

Feltron annual report

by Nicholas Felton



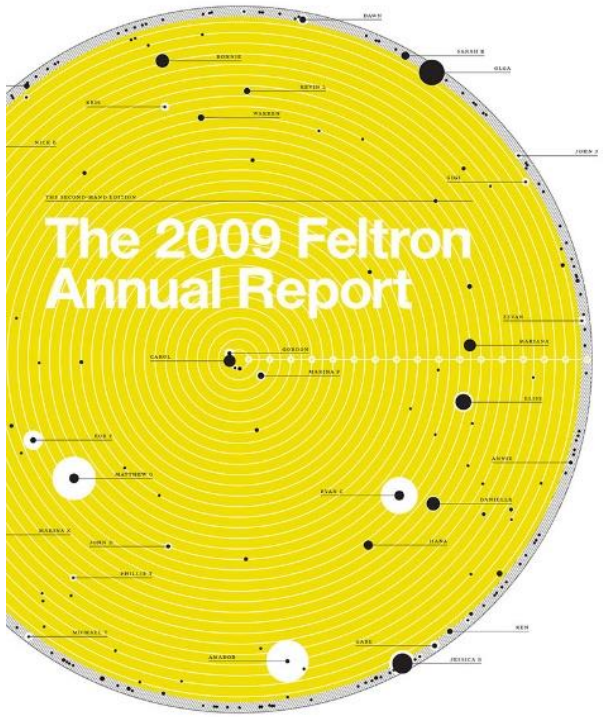


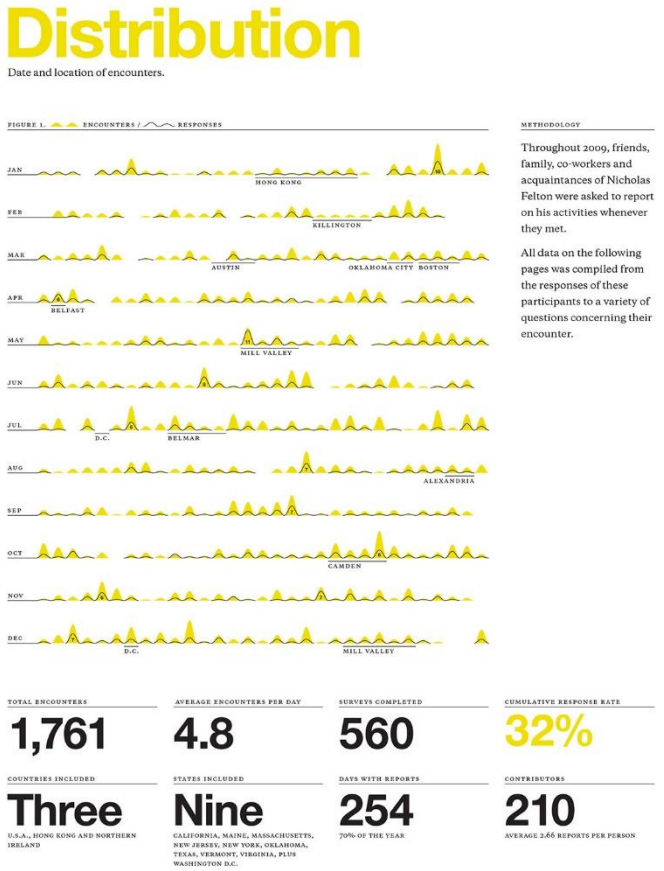


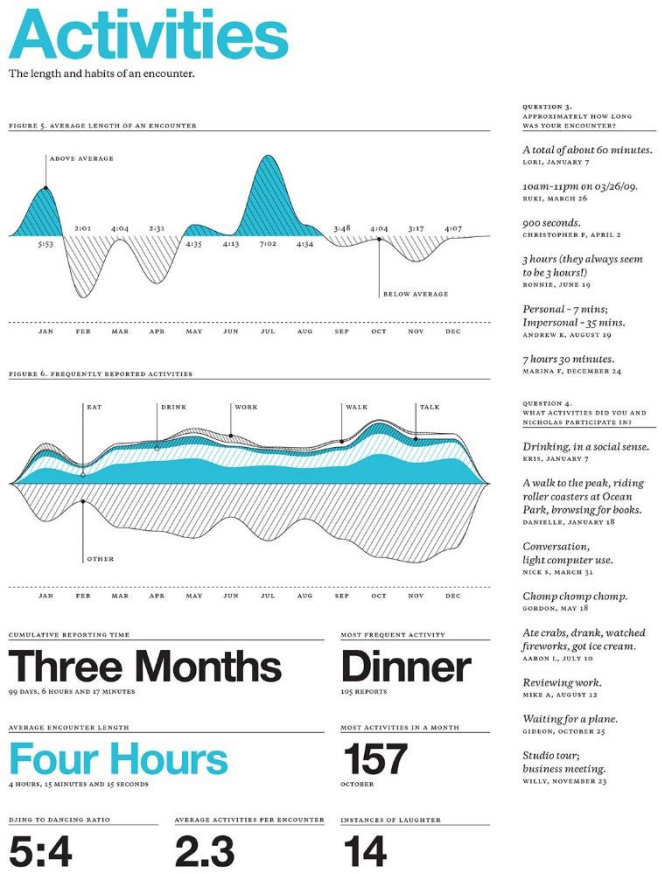
http://feltron.com/FAR07.html

Feltron annual report

by Nicholas Felton







http://feltron.com/FAR09.html

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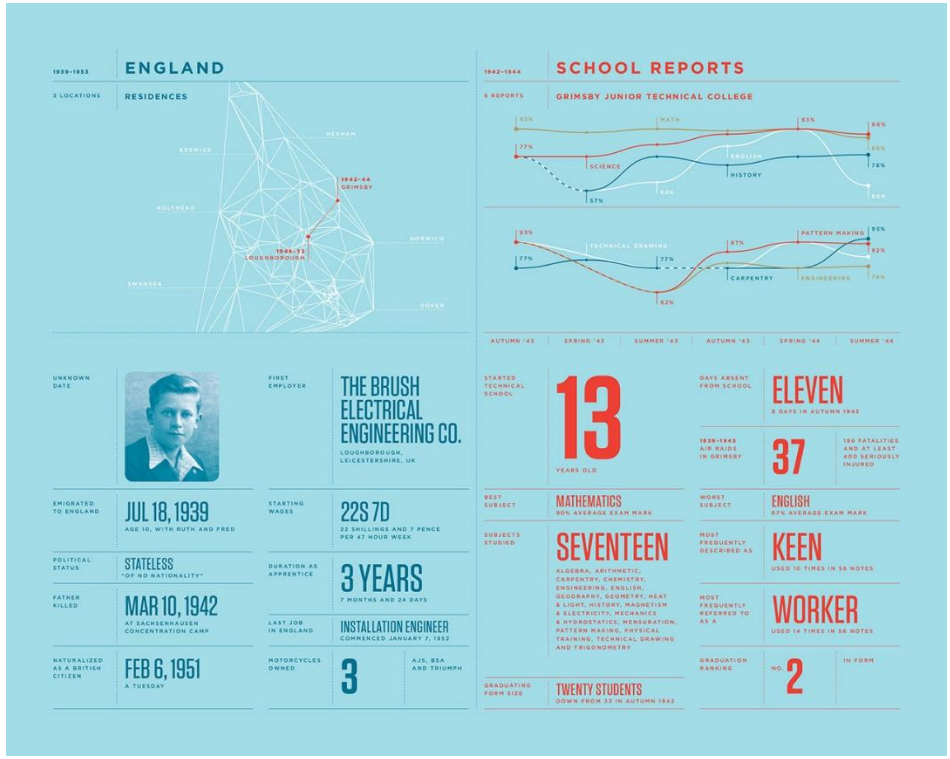
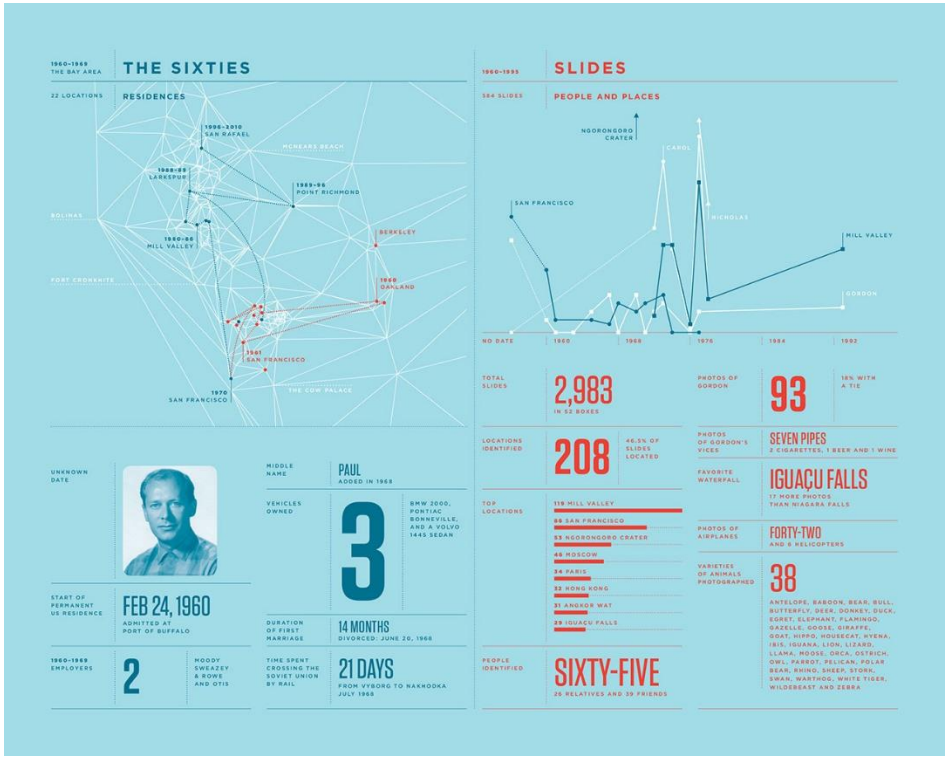
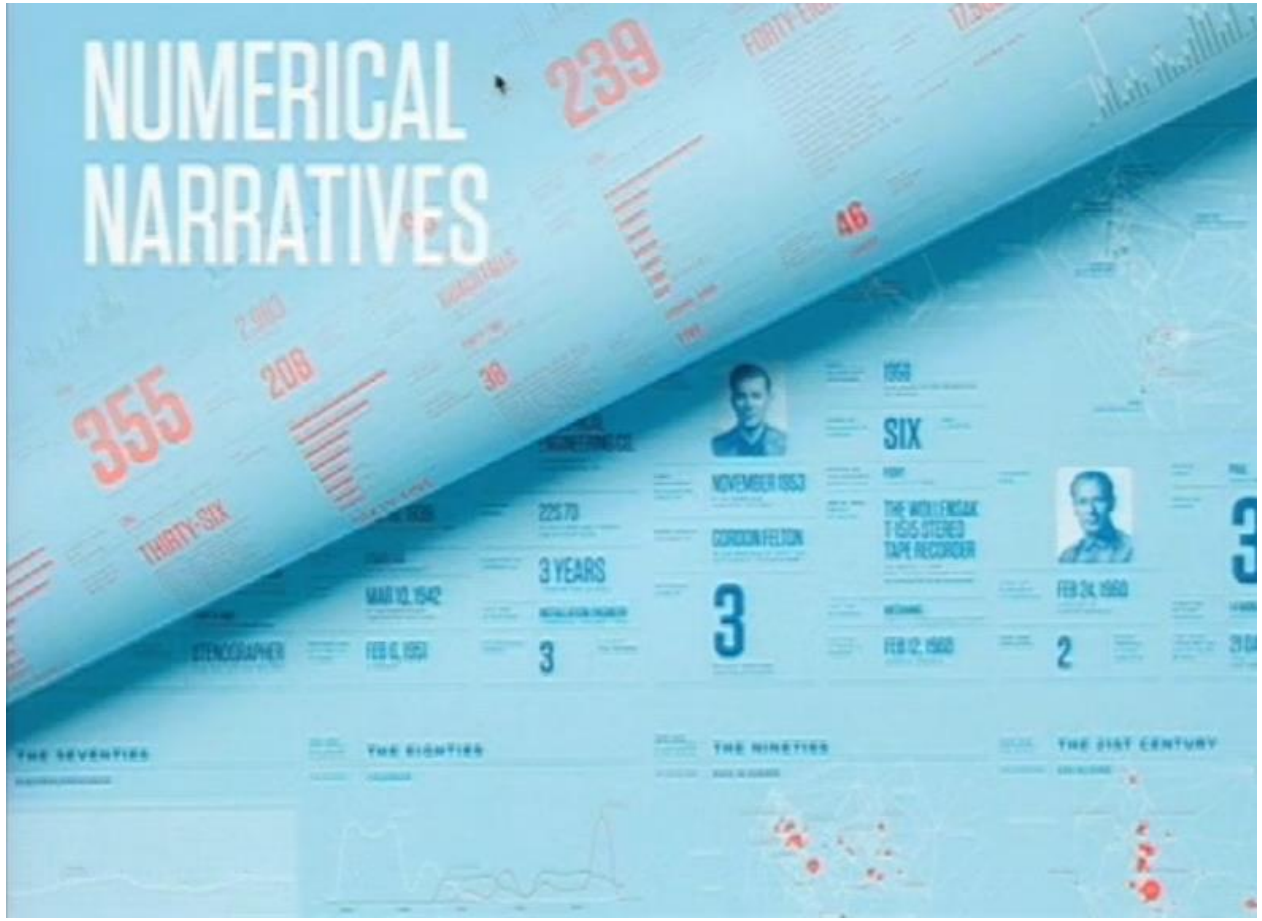




http://feltron.com/FAR10.html

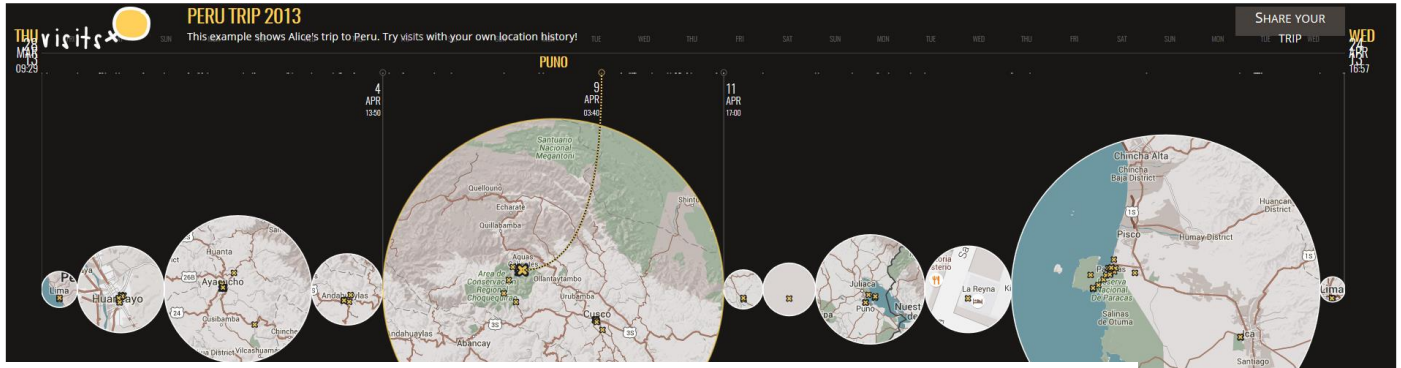
More info on Feltron's process

- Nicholas Felton – Numerical Narratives
  - Eyeo Festival 2011

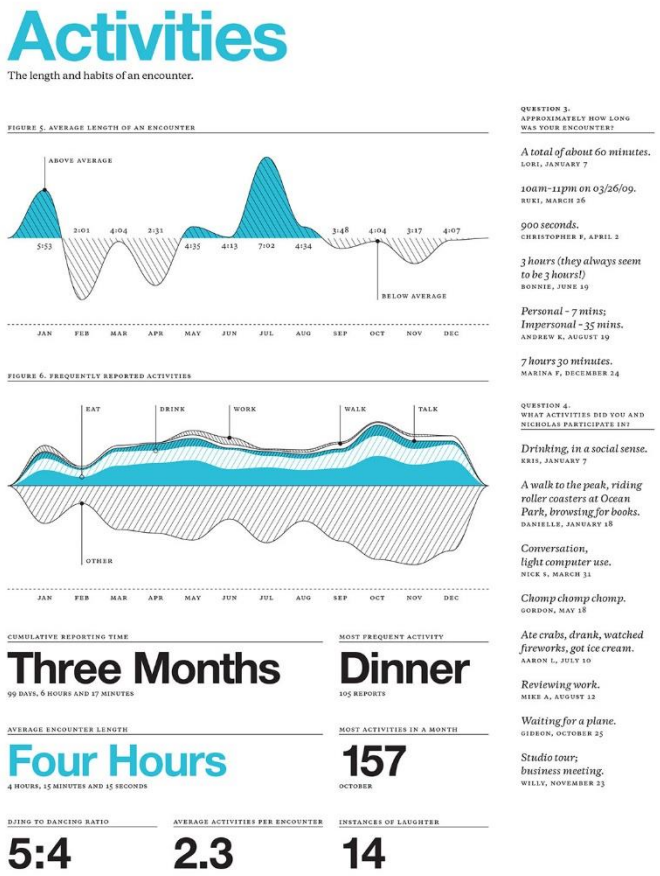


https://vimeo.com/27800118

Session 4.1
Applications I



Personal Data Visualization



Online Course
Data Visualization for Professionals

THE UNIVERSITY of EDINBURGH

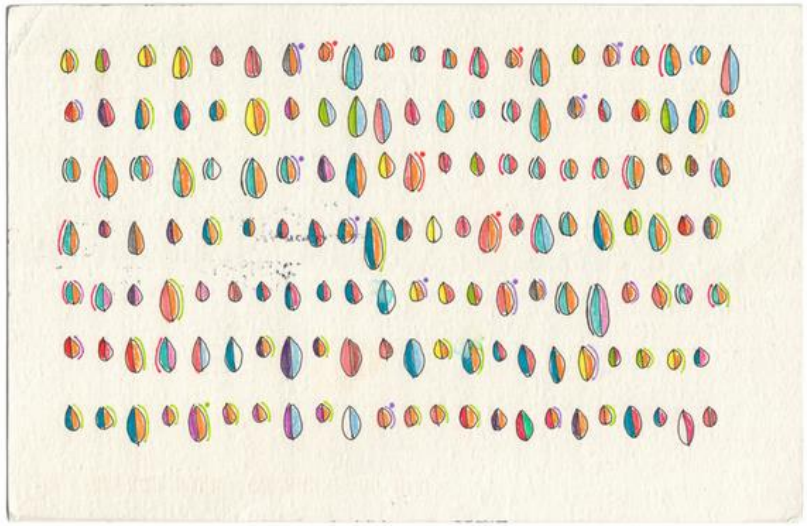
Uta Hinrichs
July 2020
https://sachi.cs.st-andrews.ac.uk/people/faculty/
https://datavis-online.github.io

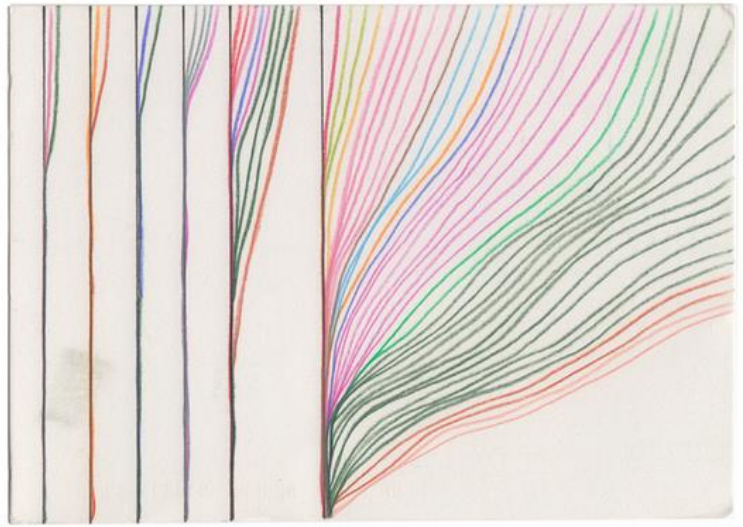
Dear Data

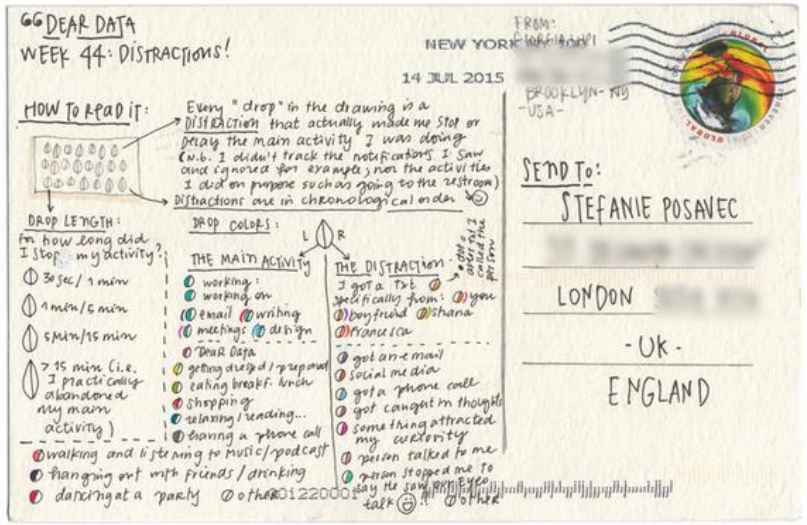
Giorgia Lupi & Stafanie Prosavec

http://www.dear-data.com

week 44: a week of distractions



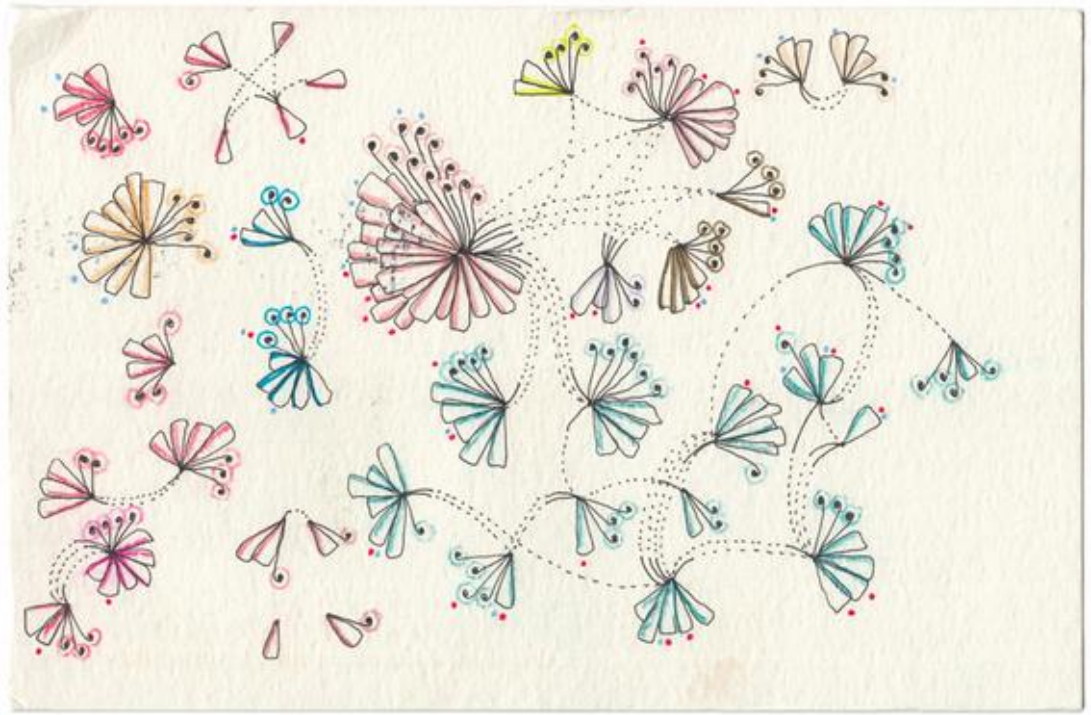




http://www.dear-data.com

week 42: a week of laughter

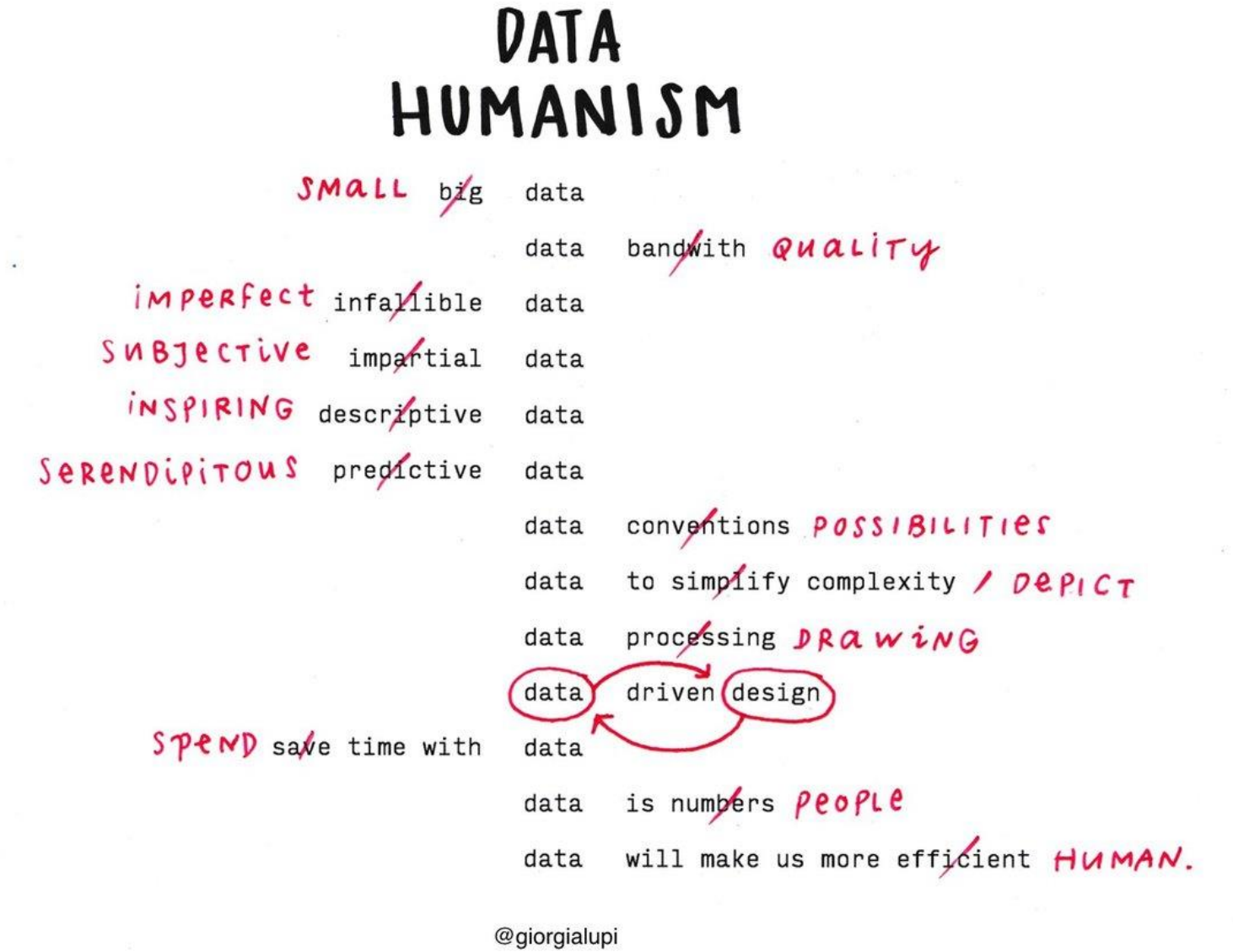
visualization of the week



... 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!)

http://www.dear-data.com

data humanism



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http://giorgialupi.com/data-humanism-my-manifesto-for-a-new-data-wold