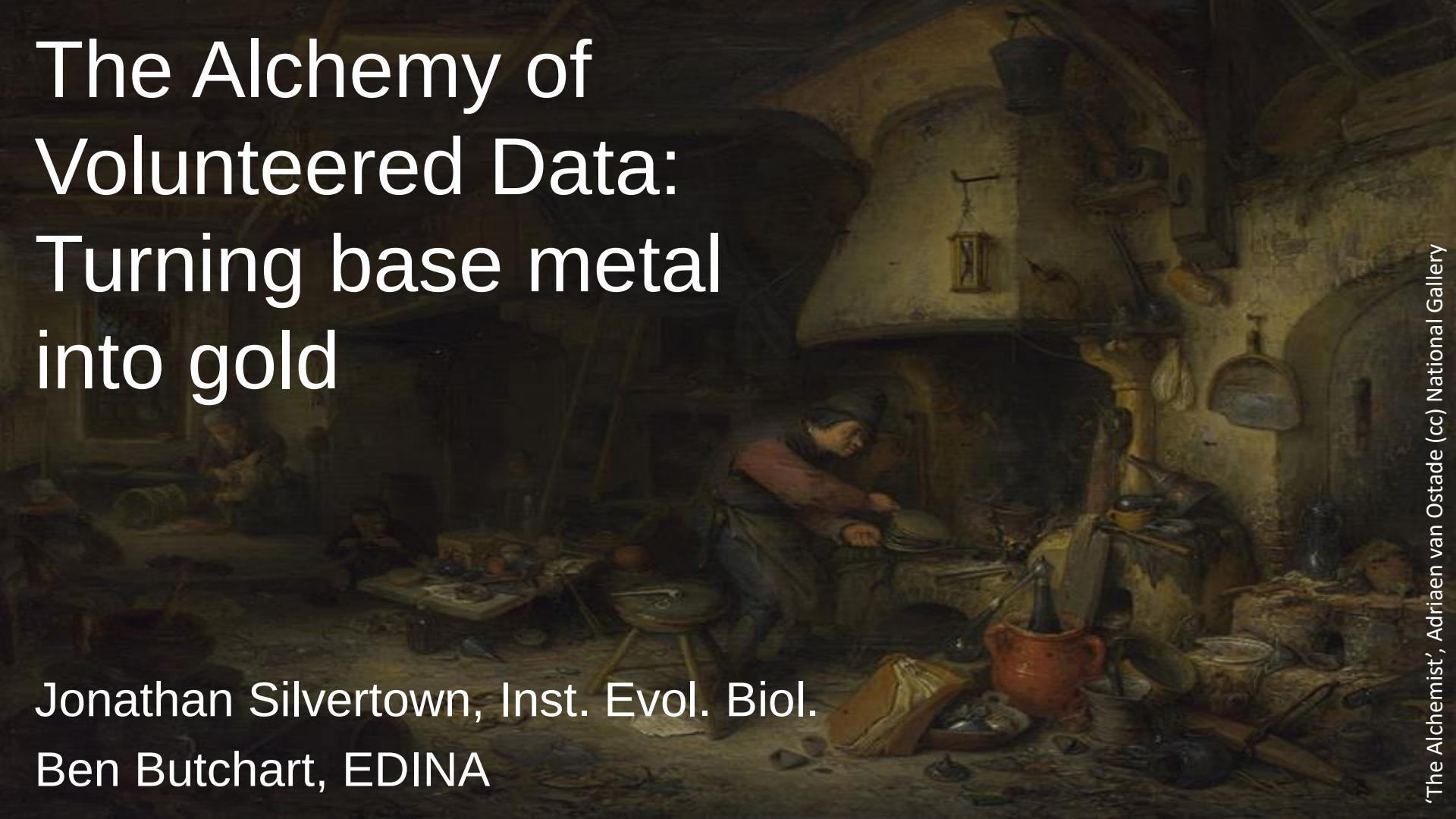
The Alchemy of Volunteered Data: Turning base metal into gold

Jonathan Silvertown, Inst. Evol. Biol.

Ben Butchart, EDINA



'The Alchemist', Adriaen van Ostade (cc) National Gallery

Courtesy Michael Pocock, Biological Records Centre

Three examples

Data	Collection	Cleaning	Analysis
1. Evolution MegaLab	Community	Experts	Experts
2. iSpotNature.org	Community	Community	Experts
3. Virtual Edinburgh	Community	Community	Community

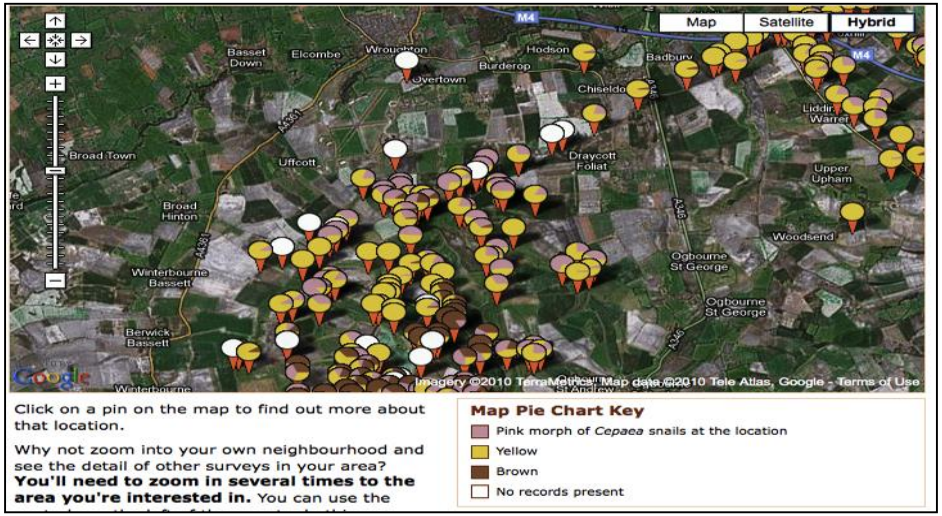
The Open University

EVolution MegaLab .org

THE ROYAL SOCIETY

BRITISH COUNCIL

8,000 historical populations digitized

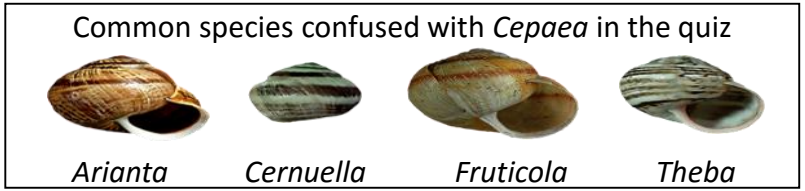


New data input

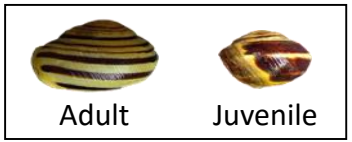
Verification

- How do we know that users are correctly identifying the different morphs?
- Use a quiz to train users to classify the morphs
- And to test user's identification skills

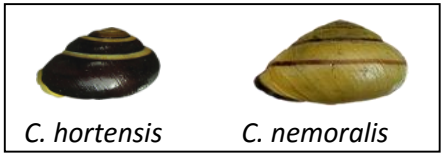
Quiz results (1st attempt)



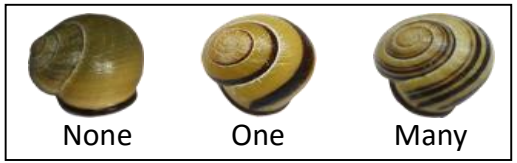
62% correctly identified *Cepaea*



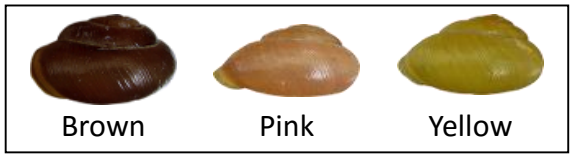
33% got adult/juvenile correct



84% got spp. of adults correct



95% scored banding correctly



94% scored yellow correctly

Results

OPEN ACCESS Freely available online

PLOS one

Citizen Science Reveals Unexpected Continental-Scale Evolutionary Change in a Model Organism

Jonathan Silvertown[1]*, Laurence Cook[2], Robert Cameron[3], Mike Dodd[1], Kevin McConway[4], Jenny Worthington[1], Peter Skelton[5], Christian Anton[6¤], Oliver Bossdorf[7], Bruno Baur[8], Menno Schilthuizen[9], Benoît Fontaine[10], Helmut Sattmann[11], Giorgio Bertorelle[12], Maria Correia[13], Cristina Oliveira[13], Beata Pokryszko[14], Małgorzata Ożgo[15], Arturs Stalažs[16], Eoin Gill[17], Üllar Rammul[18], Péter Sólymos[19], Zoltan Féher[20], Xavier Juan[21]

1 Department of Life Sciences, The Open University, Milton Keynes, United Kingdom, **2** Faculty of Life Sciences, The University of Manchester, Manchester, United Kingdom, **3** Department of Animal and Plant Sciences, University of Sheffield, Sheffield, United Kingdom, **4** Department of Mathematics and Statistics, The Open University, Milton Keynes, United Kingdom, **5** Department of Earth and Environmental Sciences, The Open University, Milton Keynes, United Kingdom, **6** Department of Community Ecology, Helmholtz Centre for Environmental Research – UFZ, Halle, Germany, **7** Institute of Plant Sciences, University of Bern, Bern, Switzerland, **8** Section of Conservation Biology, Department of Environmental Sciences, University of Basel, Basel, Switzerland, **9** Netherlands Centre for Biodiversity Naturalis, Leiden, The Netherlands, **10** Département Ecologie et Gestion de la Biodiversité, Muséum National d'Histoire Naturelle, Paris, France, **11** Department of Invertebrate Zoology, Natural History Museum of Vienna, Vienna, Austria, **12** Department of Biology and Evolution, University of Ferrara, Ferrara, Italy, **13** Ciência Viva - National Agency for Scientific and Technological Culture, IBMC - Instituto de Biologia Molecular e Celular, Universidade do Porto, Porto, Portugal, **14** Museum of Natural History, Wrocław University, Wrocław, Poland, **15** Institute of Biology, Pomeranian University, Słupsk, Poland, **16** Latvia State Institute of Fruit-Growing, Dobele, Latvia, **17** Waterford Institute of Technology, Waterford, Ireland, **18** Department of Gene Technology, Tallinn University of Technology, Tallinn, Estonia, **19** Department of Biological Sciences, Alberta Biodiversity Monitoring Institute, University of Alberta, Edmonton, Canada, **20** Department of Zoology, Hungarian Natural History Museum, Budapest, Hungary, **21** Department of Science, INS Sant Quirze, Sant Quirze del Vallès, Spain

Abstract

iSpot share nature

The OpenScience Laboratory

The Open University

Jonathan | + Add | Explore community | Identify | ★ Help | Communities

Communities - UK and Ireland

+ Add observation

UK and Ireland latest observations

« more

Filter by group:

more »

Help confirm global observations

« more

Filter by group:

more »

Edit the news stories

Projects on iSpot

iSpot Projects were a new feature when our new site was launched in August. iSpotters have been making good use of Projects since then - read on to find out how.

Take a quiz to test your identification skills!

Have you tried out the iSpot identification quizzes? Test your skills and practice identifying the different wildlife groups, selected from the

Search iSpot

Go

Administration

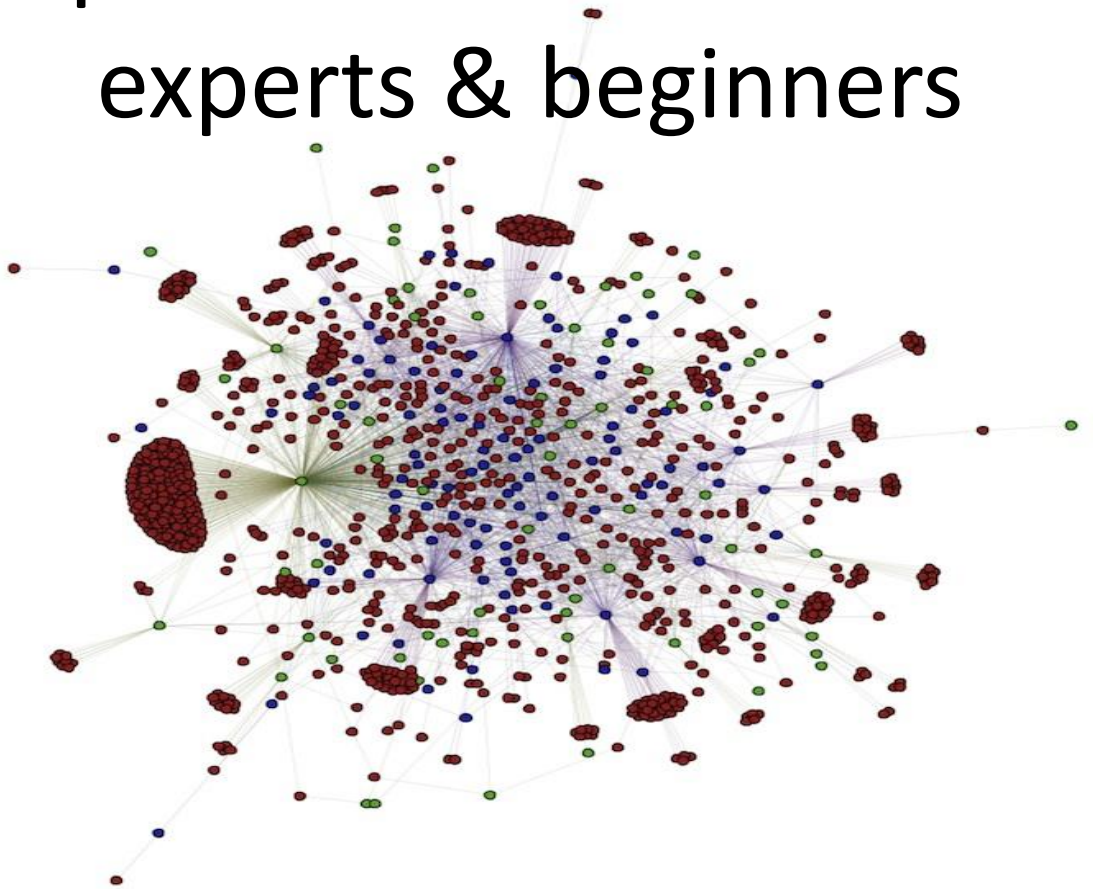
- Edit users
- Edit habitats
- Create content
- Administer the site
  - Content management
  - Site building
  - Organic groups
  - Site configuration
  - Check for spam users
  - User management
  - Reports
  - Help

iSpot Admin

- Add iSpot News item
- Reports
  - iSpot Team usage
  - Hear about
  - Mentor usage


550,000 observations
1 million images
52,000 registered users
30,000 species identified

The iSpot social network includes experts & beginners



- Received ID
- Gave ID
- Gave & Rcd. ID

n = 5,000

Silvertown et al. (2015) *ZooKeys* 480: 125-46.

(Added to iSpot on 29th January 2012)

Location: Winslade

Identification

Red Carpet (*Xanthorhoe decoloraria*) by chrisbrooks at 8:15 am 29/01/12

Confidence: It might be this.

Notes: Struggled with this one bit I think it's a Red Carpet

I agree!

Search Encyclopedia of

View NBN map for Xant

Users who've agreed

- DavidHowdon
- nightfly
- LordMuzzy
- DavidNotton
- DD
- David Jardine

Shaded Broad-bar (*Scoto*

at 8:21 am 29/01/12

Confidence: I'm as sure as

I agree!

ID agreements (👍): 6 pe

Search Encyclopedia of

View NBN map for Scoto

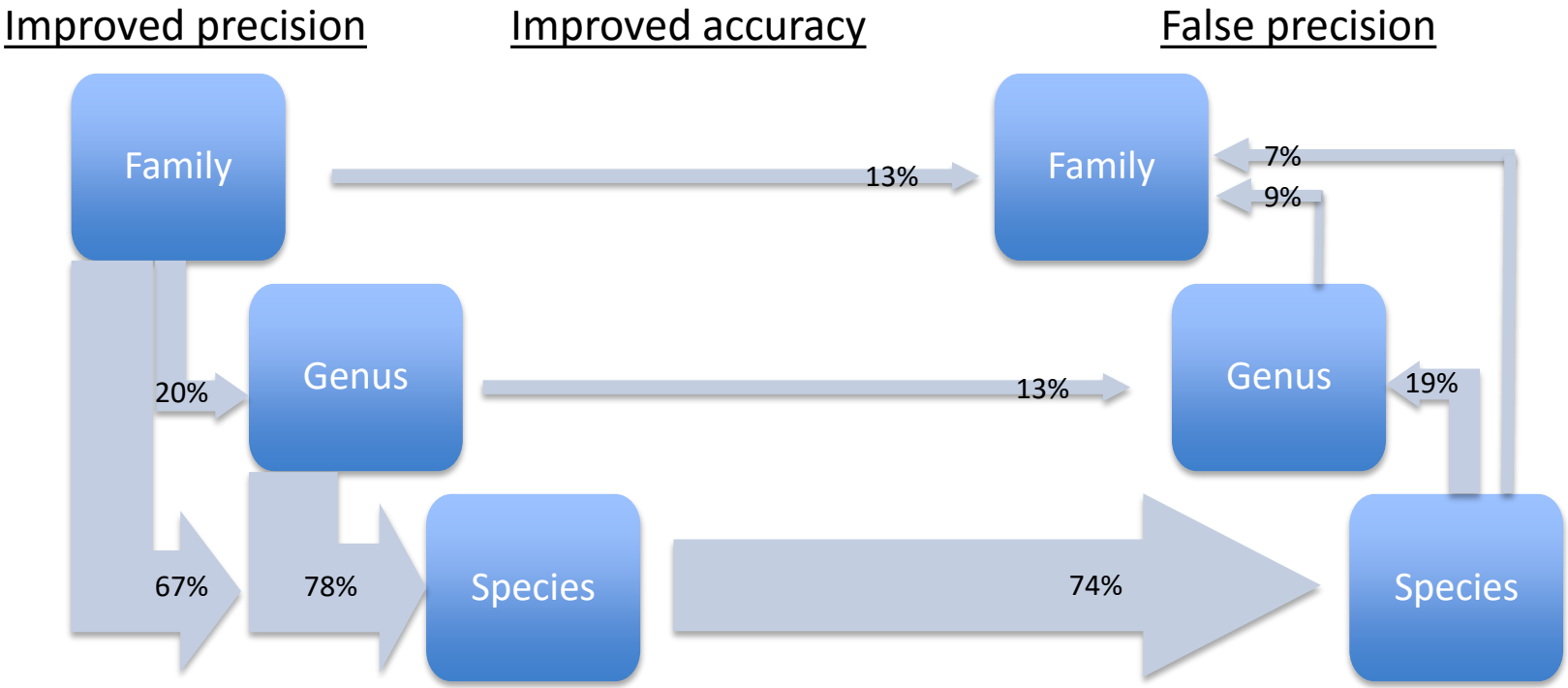
"Likely ID"

Reputation

Reputation in groups

Group	Reputation	Observations	Identifications	Received	Given
Other organisms		2	5	1	22
Birds		49	54	307	146
Invertebrates		232	290	437	359
Fish		2	1	2	6
Amphibians and Reptiles		5	7	28	16
Mammals		13	15	52	25
Plants		214	349	879	686
Fungi and Lichens		66	87	107	100

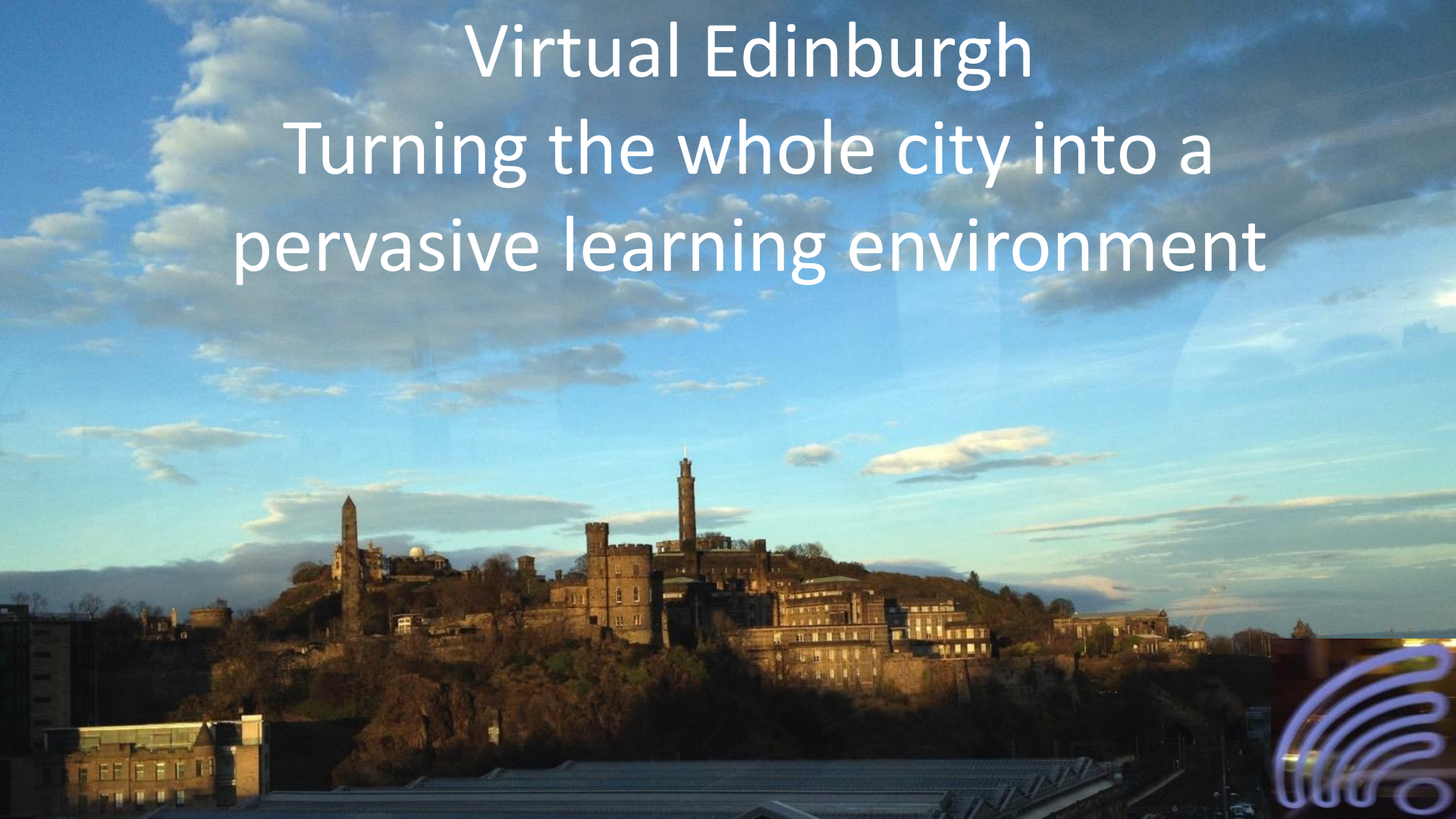
How the iSpot community corrects names

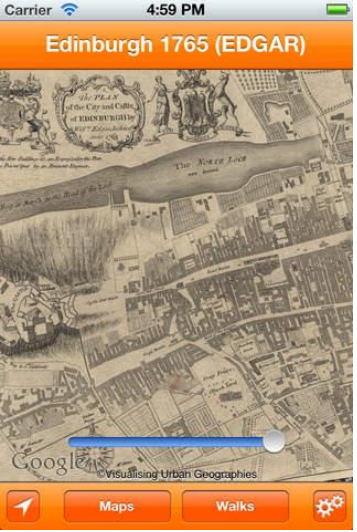


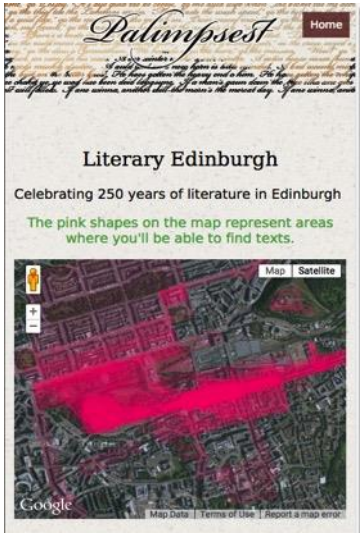
% Changes from the original taxon, n = 13,568

Silvertown et al. (2015) *ZooKeys* 480: 125-46.

Virtual Edinburgh
Turning the whole city into a pervasive learning environment

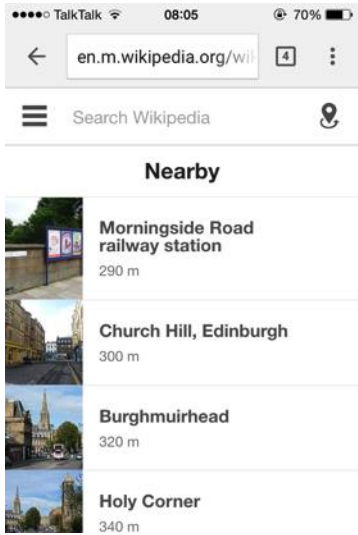



Carrier
4:59 PM
Edinburgh 1765 (EDGAR)
©Visualising Urban Geographies
Maps
Walks

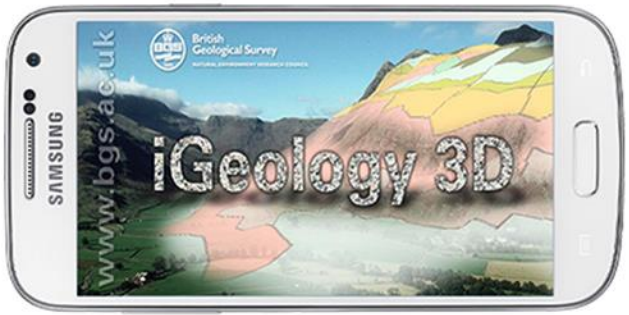

Palimpsest
Home
Literary Edinburgh
Celebrating 250 years of literature in Edinburgh
The pink shapes on the map represent areas where you'll be able to find texts.
Map
Satellite
Google

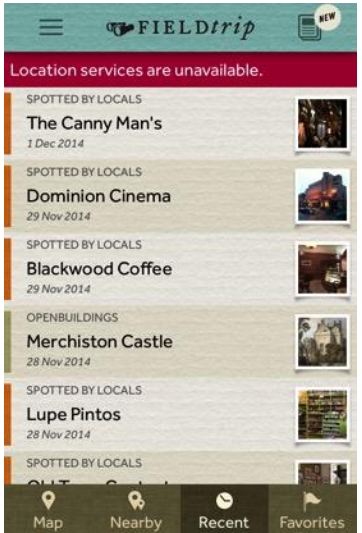

TalkTalk
07:59
70%
Fieldtrip GB
Maps
Online
Saved
Help
Capture
Images
Audio
Text
GPS Track
Download and Sync
Home
Map
Capture
Download


iSpot share nature
Communities » UK and Ireland
Identify
Add your observation, the community helps identify it.
UK and Ireland latest observations
« more
Filter by group:
more »
Help confirm global observations


TalkTalk
08:05
70%
en.m.wikipedia.org/wi
Search Wikipedia
Nearby
Morningside Road railway station
290 m
Church Hill, Edinburgh
300 m
Burghmuirhead
320 m
Holy Corner
340 m


MESH
ABOUT
OUTPUTS
GET INVOLVED
NEWS AND EVENTS


SAMSUNG
www.bgs.ac.uk
British Geological Survey
iGeology 3D


FIELDtrip
NEW
Location services are unavailable.
SPOTTED BY LOCALS
The Canny Man's
1 Dec 2014
SPOTTED BY LOCALS
Dominion Cinema
29 Nov 2014
SPOTTED BY LOCALS
Blackwood Coffee
29 Nov 2014
OPENBUILDINGS
Merchiston Castle
28 Nov 2014
SPOTTED BY LOCALS
Lupe Pintos
28 Nov 2014
SPOTTED BY LOCALS
Map
Nearby
Recent
Favorites


About
Mapping Edinburgh's Social History

“Emerging Vision for Learning and Teaching”

Identifies how the curriculum needs to develop in order to prepare undergraduates for a complicated and unpredictable future.

Two of the key developments proposed are to:

1. Give students agency to create their own learning
2. Introduce the technology appropriate for student-centred pedagogy, enabling teaching to cater for less passive learning styles.

Modes of Student Participation

Within pre-baked *VE* apps:

- Retrieve data, add data
- Peer-to-peer interaction, game play

Using *VE* tools create:

- New apps
- Re-versioned apps
- New data layers
- Mashups

Infrastructure

Teaching & Learning Infrastructure
- a community of people who are able to develop and use mobile apps in pedagogy

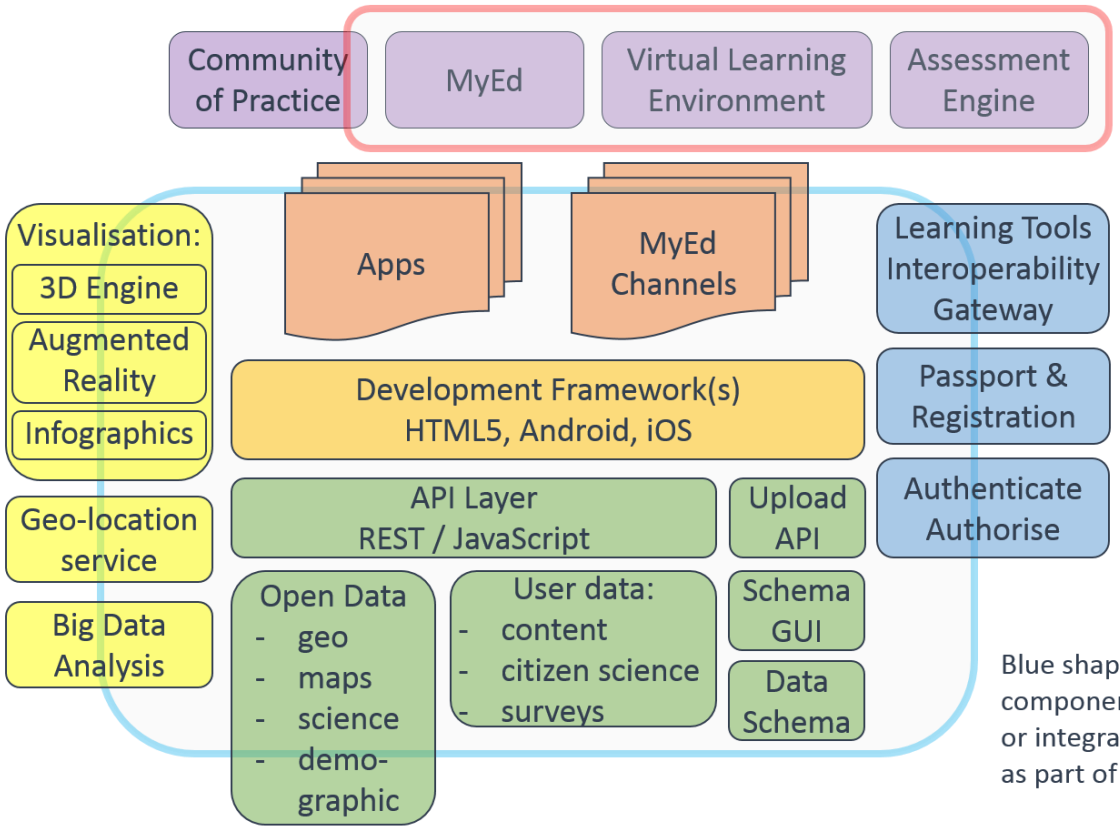
Data Infrastructure
- data and data sets relating to Edinburgh and environs

Technical Infrastructure
- a technical infrastructure to hold the data and enable development

Making Edinburgh a city of Learning
- ✓ Mobile apps
- ✓ Within Edinburgh
- ✓ With pedagogic aims

➢ Enabling the public to walk through the city and experience their location from a historic, geologic and contemporary perspective, and contribute data and experience

Virtual Edinburgh components



DataCraft

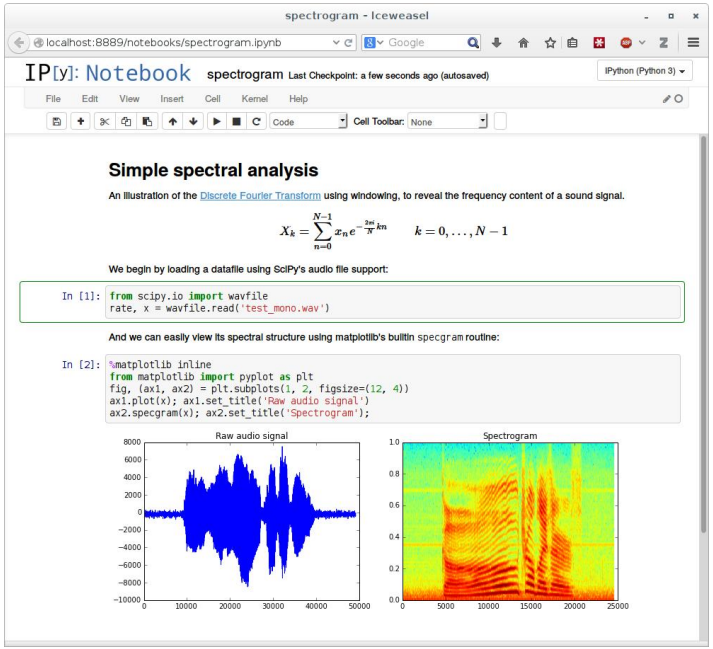
+

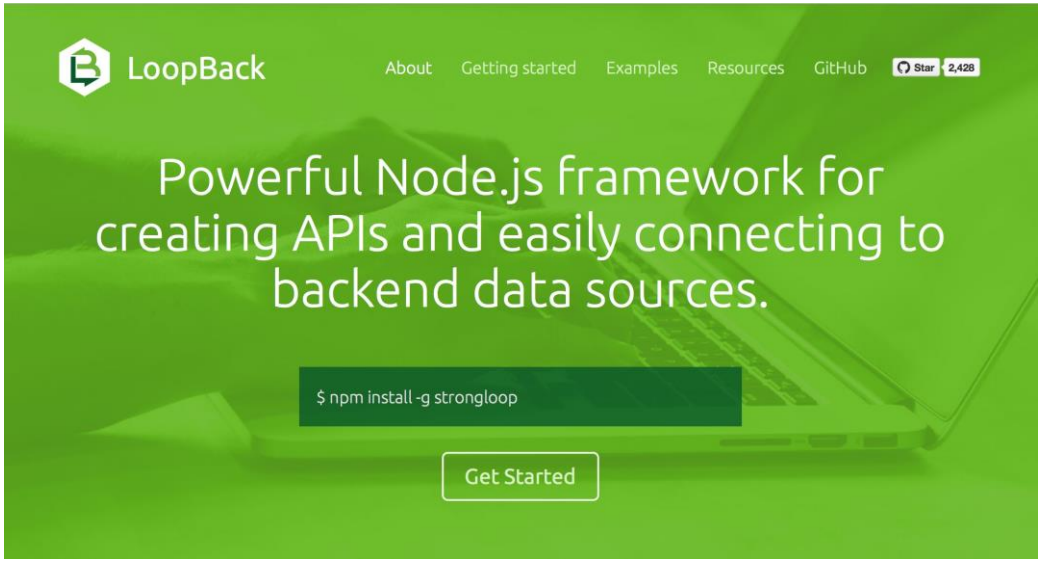
=

DataCraft

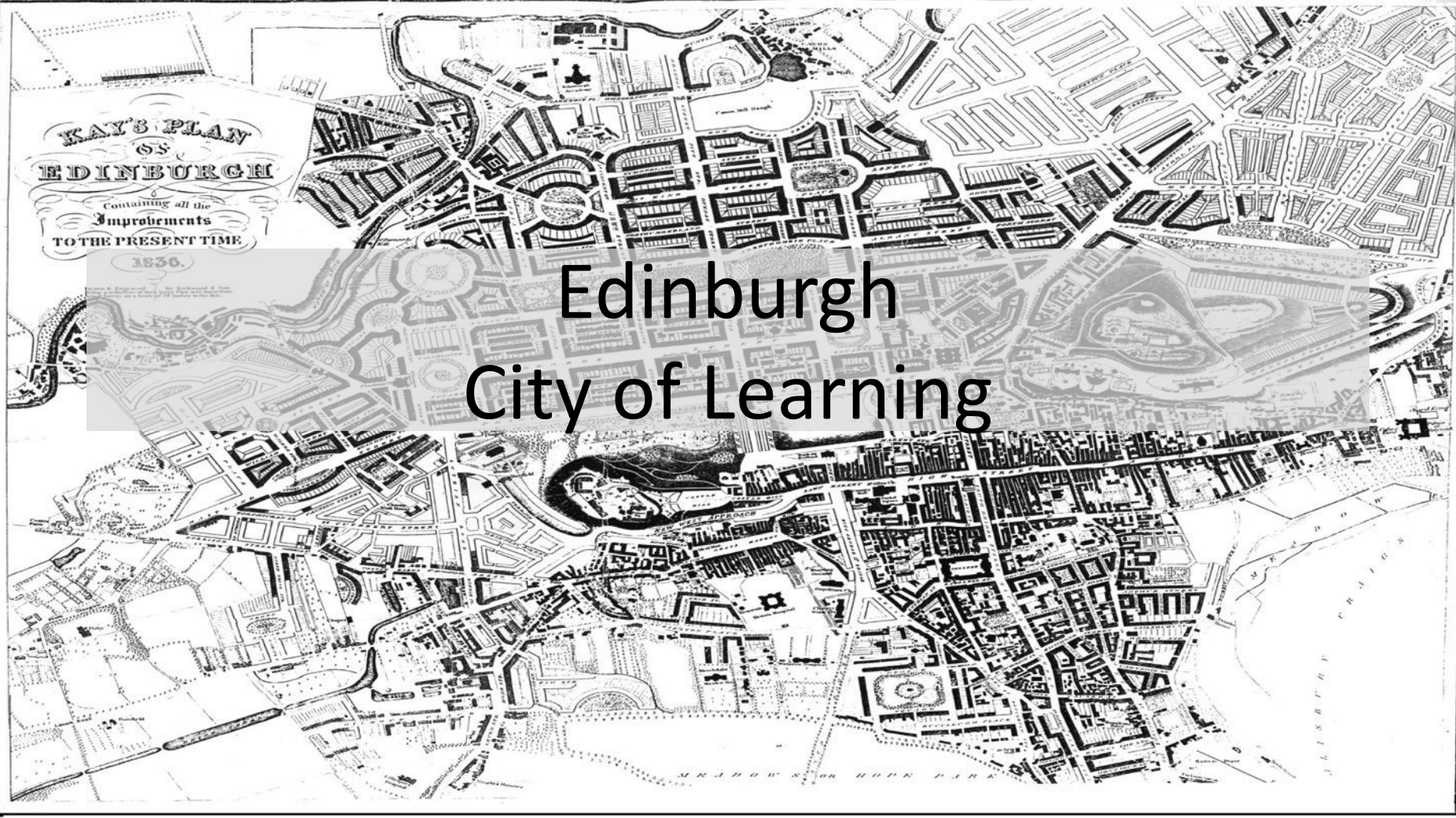
“ for people who want to make cool stuff from data”

JupyterHub and Loopback.io





jupyterhub



Edinburgh
City of Learning

Virtual Edinburgh Steering Group

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