ETC5512: Wild Caught Data

Week 2

Open data sources

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Examples of open data?

https://www.globalforestwatch.org/

Open data is...

a raw material for the digital age but,

unlike coal, timber or diamonds,

it can be used by anyone and everyone at the same time.

https://www.europeandataportal.eu/elearning/en/module1/#/id/co-01

Why open data useful?

- Benefits to governments, businesses and individuals.
- Improves services, grows economies and protects our planet.
- Restrictions will limit its potential.

What makes data open?

- Limitations
  - No limitations that prevent particular uses.
  - Anyone free to use, modify, combine and share, even commercially.
- Cost
  - Free to use does not mean that it must be free to access.
  - Cost to creating, maintaining and publishing usable data.
  - Live data and big data can incur ongoing costs.
- Reuse
  - Free to use, reuse and redistribute it - even commercially.

Definition open data

Open data can be freely used, modified, and shared by anyone for any purpose

There are two dimensions of data openness:

- The data must be legally open, which means they must be placed in the public domain or under liberal terms of use with minimal restrictions.
- The data must be technically open, which means they must be published in electronic formats that are machine readable and non-proprietary, so that anyone can access and use the data using common, freely available software tools. Data must also be publicly available and accessible on a public server, without password or firewall restrictions.

http://opendefinition.org/

Why license open data?

- Tells anyone that they can access, use and share data.

- Unless you have a licence, data may be 'publicly available', but users will not have permission to access, use and share it under copyright or database laws.

Open data licenses

- Standard re-usable license: consistent and broadly recognized terms of use
  - Creative Commons, particularly CC-By and CC0 https://creativecommons.org/
  - Open Database License https://opendatacommons.org/licenses/odbl/
- Bespoke licenses: governments and international organizations developed
  - UK Open Government License http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/
  - The World Bank Terms of Use https://data.worldbank.org/summary-terms-of-use

Open data Machine Readability

- Documents
  - static and frozen in their format
- Data
  - dynamic and can be open to further processing

https://www.data.gov/developers/blog/primer-machine-readability-online-documents-and-data

Open data Machine Readability

Open data Machine Readability

Metadata: data about data

Information necessary to use the data

- Source
- Structure
- Underlying methodology
- Topical
- Geographic and/or temporal coverage
- License
- When it was last updated
- How it is maintained

Metadata: data about data

- Dublin Core Metadata Initiative (DCMI) provides a framework and core vocabulary of metadata terms.
  - https://www.dublincore.org/

- Governments develop metadata models to provide further uniformity to government-wide Open Data initiatives.
  - https://project-open-data.cio.gov/v1.1/schema/

Metadata: example

- https://open.canada.ca/data/en/dataset/4a1b260a-7ac4-4985-80a0-603bfe4aec11

- https://data.worldbank.org/

Open data quality

Legal requirements:

- Protect sensitive information like personal data.
- Preserve the rights of data owners.
- Promote correct use of the data.

Open data quality

Practical requirements:

- Link to the data from their website.
- Update the data regularly if it changes.
- Commit to continue to make the data available.

Open data quality

Technical requirements:

- The format in which the data is published.
- The structure of the data.
- The channels through which the data is available.

Five star open data scheme

- 1 star - An open license
- 2 stars - Re-usable format
- 3 stars - Open format
- 4 stars - use URIs
- 5 stars - Link data

https://5stardata.info/en/

Cleaning data

Common pittfalls wild data.

- Mixed date formats american/european
- Multiple representations differences in abbreviations, capitalisation, spacing
- Duplicate records
- Redundant data
- Mixed numerical scales
- Spelling errors
- Missing values

Why do we need open data?

- Help make governments more transparent.
  - Open data allowed citizens in Canada to save the government billions in fraudulent charitable donations
- Building new business opportunities
  - Transport for London has released open data that developers have used to build over 800 transport apps.
- Protecting the planet
  - Open data about weather can provide an early warning system for environmental disasters
  - Open data is also helping consumers to understand their personal impacts on the environment

Open data sources

- http://dataportals.org/search
- http://data.un.org/
- https://datacatalog.worldbank.org/

Open data Australia:

- http://www.opendata500.com/au/
- https://opendataimpactmap.org/eap

Government data

- http://www.data.gov.au/
- https://www.data.vic.gov.au/
- https://data.melbourne.vic.gov.au/

Open data

Open data can be freely used, modified, and shared by anyone for any purpose

Flavours of open data

How to tell if the open data is not so good to consume

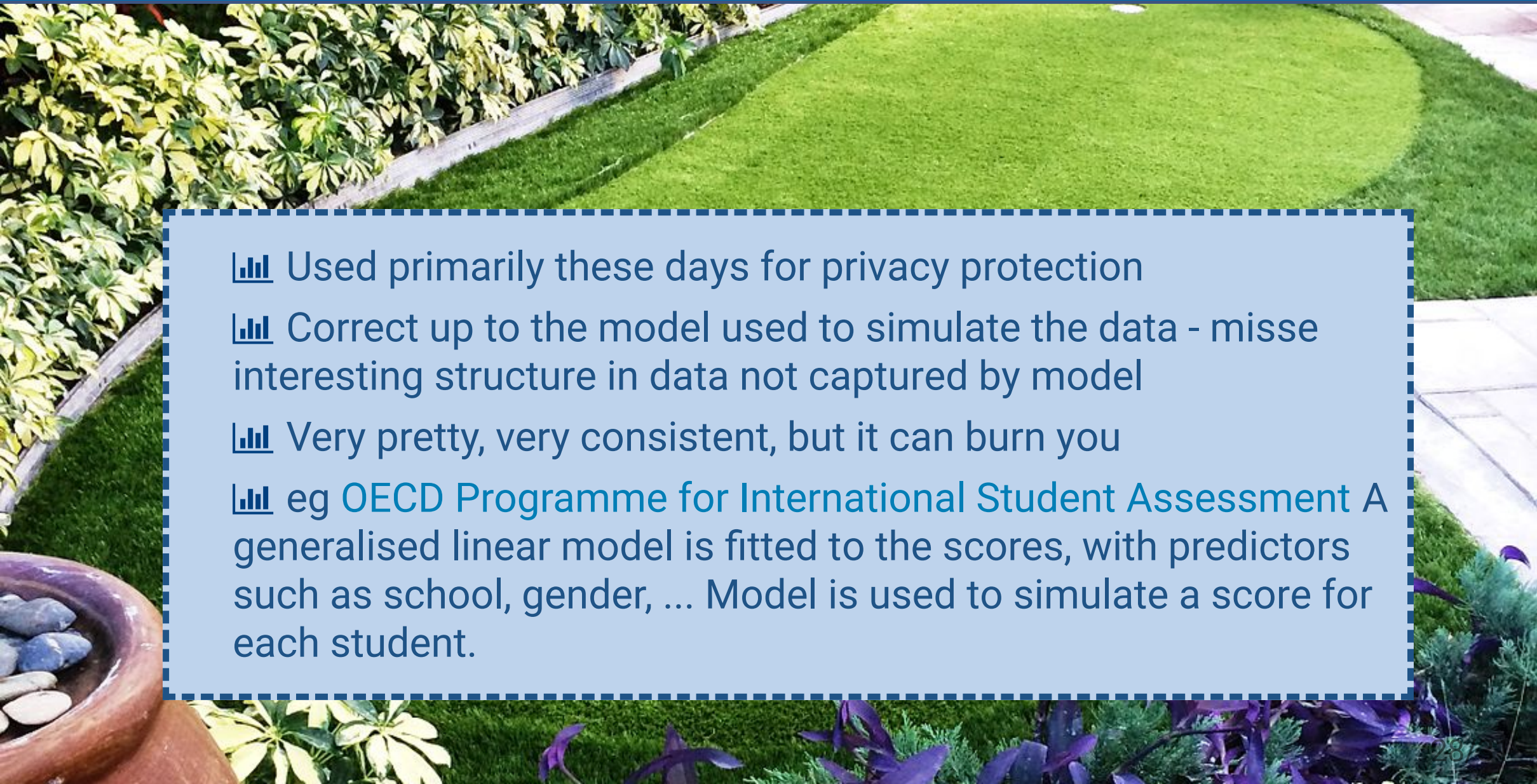
Long shelf life, highly processed

- Convenient, but contains unhealthy ingredients, and is a bad habit
- eg iris, mtcars, titanic, handwritten digits
- Found at eg UCI Machine learning archive

Orphans

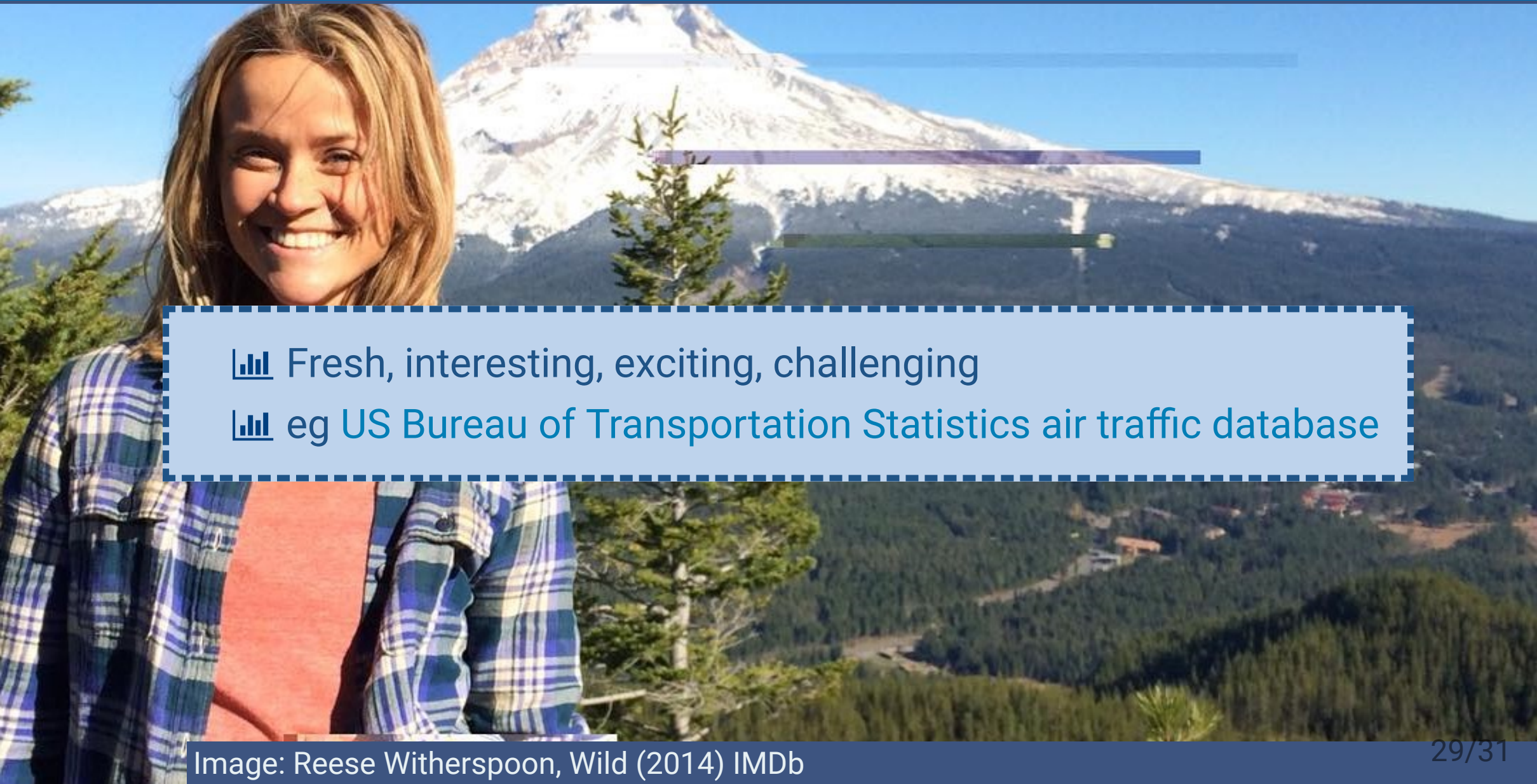
- File dumped on an archive
- Stale, could date your results
- Found in places like https://data.gov.au

Synthetic



- Used primarily these days for privacy protection
- Correct up to the model used to simulate the data - misse interesting structure in data not captured by model
- Very pretty, very consistent, but it can burn you
- eg OECD Programme for International Student Assessment A generalised linear model is fitted to the scores, with predictors such as school, gender, ... Model is used to simulate a score for each student.

Wild



- Fresh, interesting, exciting, challenging
- eg US Bureau of Transportation Statistics air traffic database

Image: Reese Witherspoon, Wild (2014) IMDb

Fresh and local

- Wild data, collected locally, and impacting our own lives
- eg Melbourne pedestrian counts

That's it!

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