

Ethics in Data Science (Part 1, Overview)

Daniel Lawson — University of Bristol

Lecture 11.1 (v2.0.0)

Signposting

- ▶ We've covered **how to do data science** in this course.
- ▶ This final lecture is about how to do it **responsibly**, i.e.
 - ▶ What laws govern data science?
 - ▶ What is Ethical data science?
 - ▶ What is privacy?
 - ▶ How can we design data science tools to protect it?
 - ▶ What is Statistical disclosure?
 - ▶ What is algorithmic bias? How can we mitigate it?
- ▶ Thanks to Raul Santos-Rodriguez and Peter Flach for access to their slides on these topics.
- ▶ This lecture is split into three parts:
 - ▶ This is part 1, on ethics and the law,
 - ▶ Part 2 covers Privacy and disclosure,
 - ▶ Part 3 covers Fairness and interpretability.

Ethical data science

- ▶ Ethical behaviour puts benefits to group or society above benefits to the individual or organisation.
 - ▶ Typically, ethical outcomes are in individuals and organisations long term interest.
 - ▶ Ethics is not **law**. But it is good when the two coincide.
 - ▶ Ethics asks what we **should** do, rather than what we **can** do.
- ▶ Data Science can be done for external ends, ethically.
 - ▶ It can also be used to improve the world by making ethical outcomes a goal.
- ▶ Not all data science is ethical. Yours can be.

Ethics and Privacy: the law

- ▶ The laws that govern data privacy in the UK (and similarly in the EU) include:
 - ▶ Human Rights Act (HRA 1998)
 - ▶ EU General Data Protection Regulation (GDPR 2018)
 - ▶ Data Protection Act 2018 (DPA 2018)

Human Rights Act

- ▶ The **HRA (Article 8)** provides the **right to privacy**. Specifically “respect for your family and private life, your home and your correspondence” including **how your personal information is held and protected**.
- ▶ The HRA sets out intentions. This right is **implemented** in various other forms of legislation.

EU GDPR / UK Data Protection Act

- ▶ The **GDPR** is an important and pervasive law implementing **data protection** rules.
- ▶ You will learn it in detail if you are employed by a company that does business in the EU.
- ▶ The **DPA (2018)** implements GDPR *in the UK* and supersedes the DPA (1998). It goes slightly further than GDPR but not in any ways that directly affect data science. These include:
 - ▶ National security,
 - ▶ Immigration,
 - ▶ Implementation.

GDPR and Data Science

- ▶ GDPR affects data science practice in three areas.
 1. GDPR imposes **limits** on data processing and consumer profiling.
 2. For organizations that use automated decision-making, GDPR creates a **“right to an explanation”** for consumers.
 3. GDPR holds firms **accountable** for bias and discrimination in automated decisions.
- ▶ The good news is that as responsible data scientists we wanted to do these things all along.
- ▶ **KDNuggets** has a very good description of how GDPR affects Data Science.

GDPR implications

- ▶ Some key implications include:
 - ▶ **Informed consent** for data usage is required except for “ordinary conduct of business”.
 - ▶ There are **constraints on data processing and profiling**, which apply **only to identifying data** individual consumer.
 - ▶ Therefore **robust anonymisation** is vital for data mining activities.
 - ▶ Pre-anonymised data must be carefully guarded, and there are legal implications for employees and businesses that do not follow best practice.

Ethical topics in data science:

- ▶ Data **ownership**:
 - ▶ Who owns your data?
- ▶ Statistical **disclosure** attacks:
 - ▶ How can data be extracted from anonymised data?
- ▶ **Interpretable** data science:
 - ▶ How do we know why an algorithm has made a particular choice?
- ▶ Algorithmic **Fairness**:
 - ▶ How can we ensure that automated decisions are not biased against particular groups of people?

Data ownership

- ▶ Who owns data? Under the GDPR, there is a **data subject** and a **data controller**. The subject has several rights, including:
 - ▶ To **object** to specific usage, and to give **clear consent** where use is acceptable,
 - ▶ To have **easy access** to their data,
 - ▶ To **rectification** of errors and for most information on them to be forgotten,
 - ▶ To data **portability**, so that their data can be moved between providers.
- ▶ The controller has the responsibility to protect the subject's rights.

Implications of data ownership

- ▶ A Company that gathers data must provide provisions for access, rectification, and portability.
 - ▶ Auditable logs of data use are required.
 - ▶ If you are the controller of data, you will need additional training.
- ▶ For data science use:
- ▶ Data used for data science must be subject to rectification and removal!
 - ▶ This is **not** retrospective, so any **results** from this data used historically, or being used in contemporary analysis, do not need to be deleted.
 - ▶ However, you cannot store copies of personal data arbitrarily; these are subject to the right to be forgotten.
- ▶ Careful processing pipelines are therefore needed to retain critical results whilst not storing individual data except temporarily.
 - ▶ Anonymised and/or aggregated data can be retained. Provided that it truly cannot be linked to an individual. . .

Reflection

- ▶ What do the acronyms HRA, GDPR and DPA mean?
- ▶ How do they relate to you as a data scientist?
 - ▶ What specific implications can you think of?
- ▶ How does GDPR change your practice?
- ▶ By the end of the course you should:
 - ▶ Be aware of the **basic regulatory framework** of privacy in the UK,
 - ▶ Be able to reason using the **general human rights** principles underlying this.

References:

- ▶ Make sure you know broadly what the legislation does!
 - ▶ Human Rights Act (HRA 1998)
 - ▶ EU General Data Protection Regulation (GDPR 2018)
 - ▶ Data Protection Act 2018 (DPA 2018)