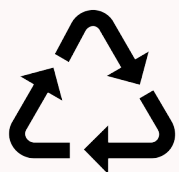




Building on FAIR principles & reproducible workflows to design *Responsible Data Science Workflows* embedding social & ethical considerations

WHAT A RESPONSIBLE
DATA SCIENCE WORKFLOW
WOULD LOOK LIKE?



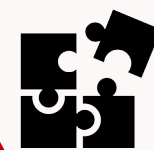
REPRODUCIBLE
REUSABLE



ENCODE COMMON
PATTERNS (OF ASSESSING
MODELS FOR SOCIAL &
ETHICAL RISKS) INTO
WORKFLOW MODULES



RESEARCHER-CENTRIC ≠
PIPELINE



MODULAR

SOURCES OF POTENTIAL BIASES IN DATA SCIENCE WORKFLOWS

STUDY DESIGN

Potential negative
consequences

- Allocative harms
- Representational harms

DATA INPUT

Historical bias
Representation bias
Measurement bias

- Proxy bias
- Label bias

DATA
PREPARATION

Missing data
Train/test split
Feature generation
Feature aggregation

DATA ANALYSIS

Sample selection
bias
Learning bias

- Algorithm bias
- Evaluation bias

BIAS MITIGATION & REPRODUCIBILITY

BIAS MITIGATION STRATEGIES
DEPEND ON THE SOURCE OF BIAS

Data augmentation
Fairness metrics
Domain knowledge
Causal inference

BIAS MITIGATION ADDS TO THE ARRAY OF CHOICES
IMPACTING REPRODUCIBILITY

Proliferation of fairness metrics: pros & cons
Gaming fairness metrics (Goodhart's law)
(Assumed) fairness-accuracy trade-off
Researcher degrees of freedom

Pre-registration
FAIR data & code
Reproducible
workflow