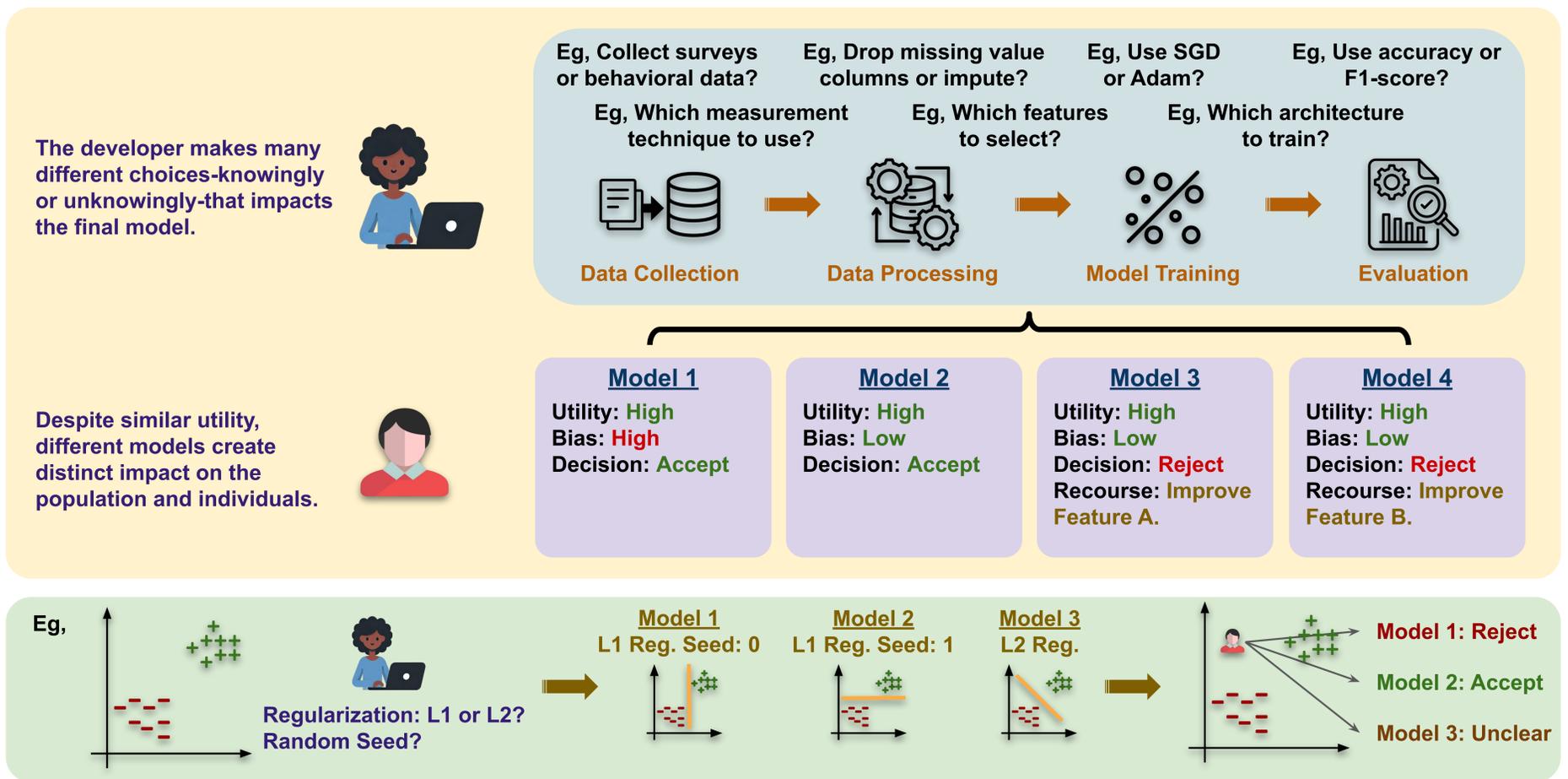




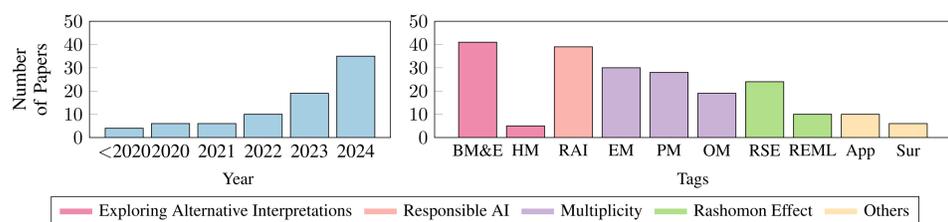
Multiplicity: Disagreement Between “Good Models”



Through choices made during development, *Multiplicity* can offer an operational lens to the issue of arbitrariness in machine learning!

Growing Multiplicity Literature

Literature on *multiplicity* has grown rapidly in the last few years.



Despite these contributions, the field lacks a systematic review!

Why Care about Multiplicity?

Exploring Alternative Interpretations: When multiple interpretations exist, some of them may exhibit certain desirable properties.

Hacking Metrics: Multiplicity also creates the risk of ‘hacking’ responsible AI metrics, creating “regulatory-washing”.

Arbitrariness as a Responsible AI Concern: Arbitrary decisions where individuals lack other ‘equivalent opportunities’ raise ethical concerns.

Multiplicity and Homogenization: Absence of diverse decisions can lead to a different concern, the homogenization of a single outcome.

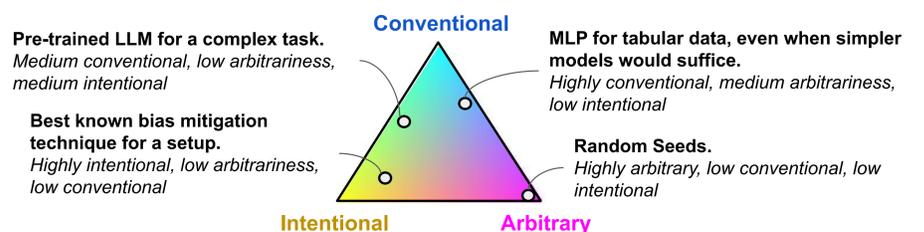
Also In Our Paper

- Formalizing Rashomon Effect and Multiplicity
- Consolidated List of Metrics for Multiplicity
- Distinction between Multiplicity and Uncertainty
- Benefits and Risks of Exploring Alternative Interpretations
- Concerns and Advantages of Arbitrariness

Intention-Convention-Arbitrariness (ICA)

Designing a model involves a series of interconnected choices, which can directly impact the multiplicity of the trained models.

Notably, these choices are not always well-informed. In some cases, they are *intentional*, guided by insights from the literature. In others, they are *conventional*, driven by popular trends or convenience. Finally, some choices remain *arbitrary*, like choosing a random seed.



Our framework provides the language and conceptual groundwork necessary to study the impact of developer decisions on multiplicity.

Wanna Learn More About Multiplicity?

Checkout the following additional resources,

- Our tutorial from FAcT 2025 titled ‘The Many Faces of Multiplicity in ML’ (soon to be expanded into a longer tutorial at AAAI 2026)
<https://tinyurl.com/mult-tutorial>
- A self-paced interactive introduction to multiplicity (to be presented at NeurIPS Education Resource Showcase 2025)
<https://tinyurl.com/mult-demo>