INSTITUTO DE INVESTIGACIONES EN MATEMÁTICAS APLICADAS Y EN SISTEMAS

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DISCUSSION AND ETHICAL CHALLENGES

Presenta:

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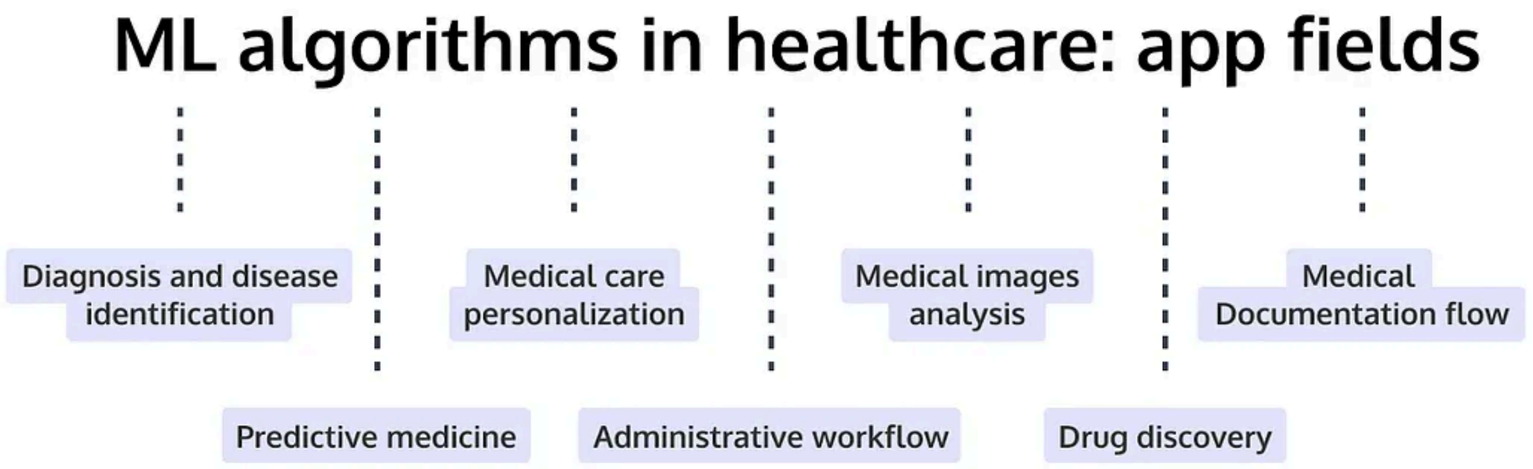
Content

Introduction

- The use of ML is transforming healthcare, but its adoption comes with significant challenges that demand our attention.

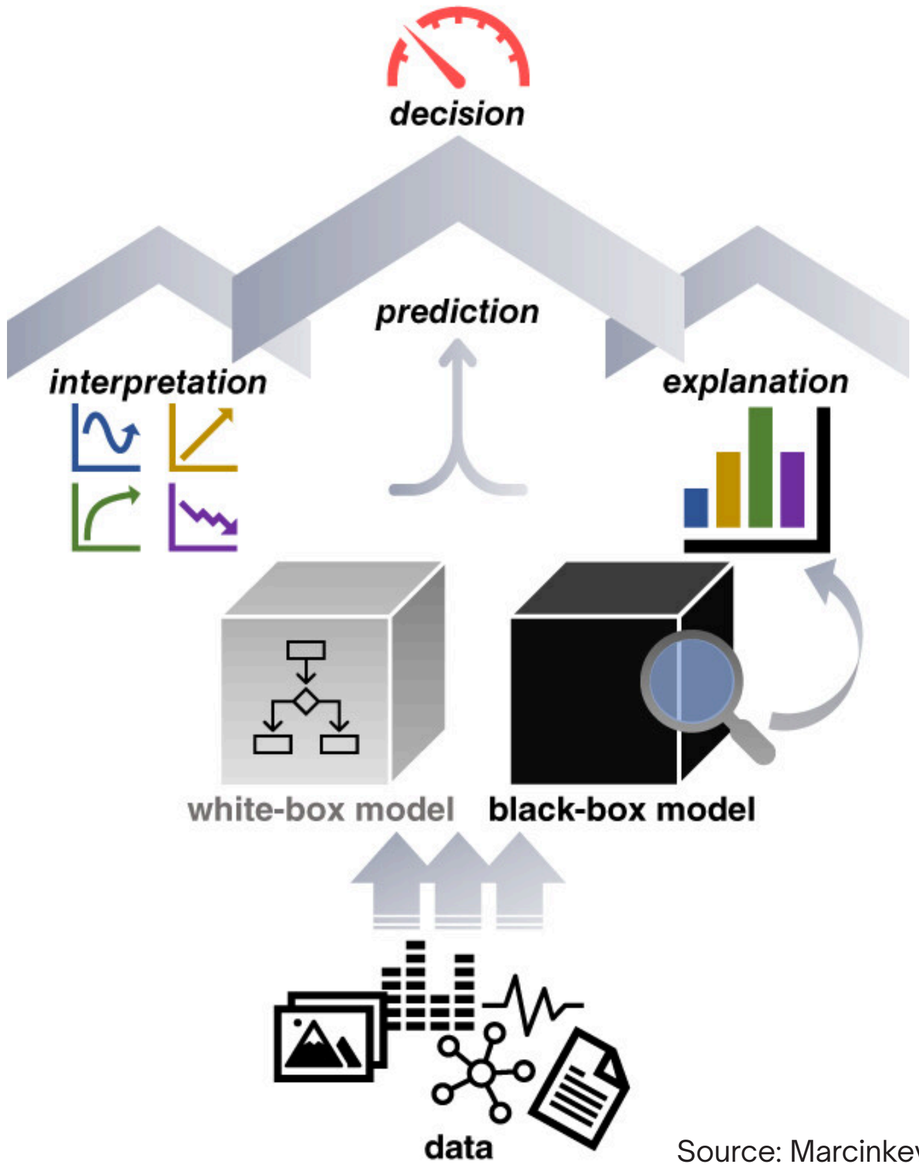
- Trust requires interpretability. Transparent models reduce bias, clarify responsibilities, and support safe clinical use.



Source: Sheth, Rutvik. (2023). Machine Learning for Healthcare: Applications and Challenges. Published on Medium.

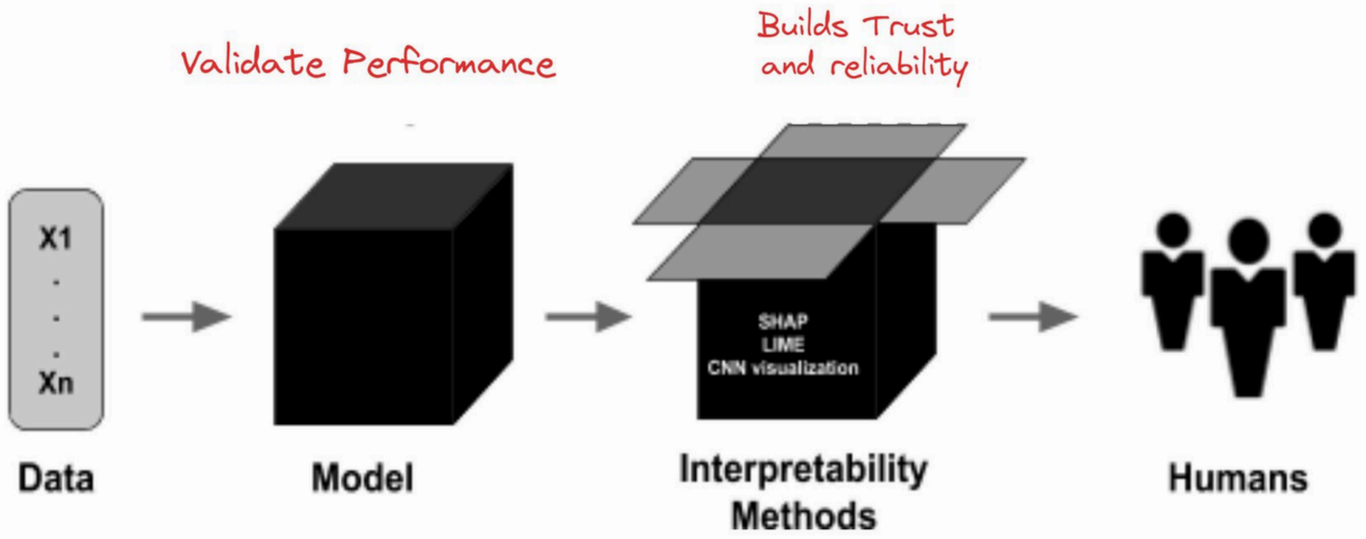
Introduction

A key aspect of responsible model experimentation is being able to understand or interpret the way in which a model has determined its predictions.



Source: Marcinkevičs et al. (2023)

Interpretability

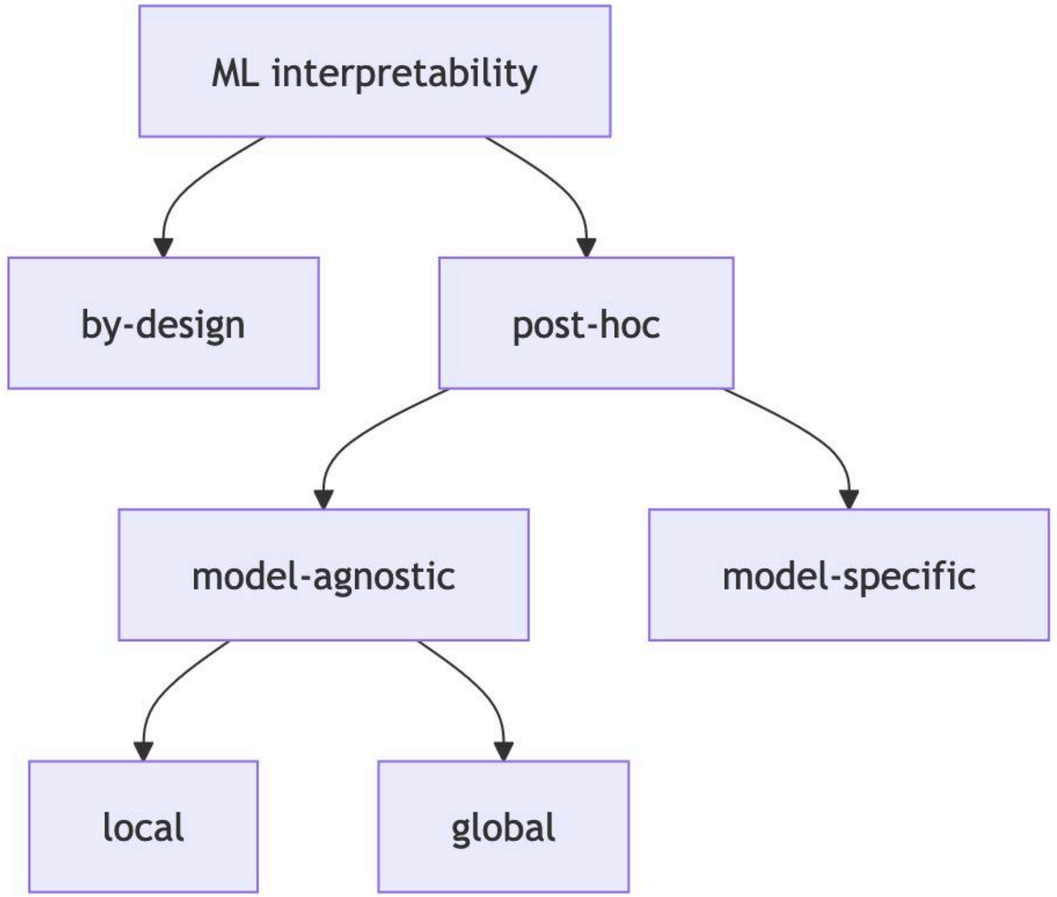


An interpretable model allows stakeholders, including data scientists and non-experts, to comprehend the logic behind the model's decisions.

Methods: Linear models, decision trees, and simpler algorithms often inherently possess high interpretability.

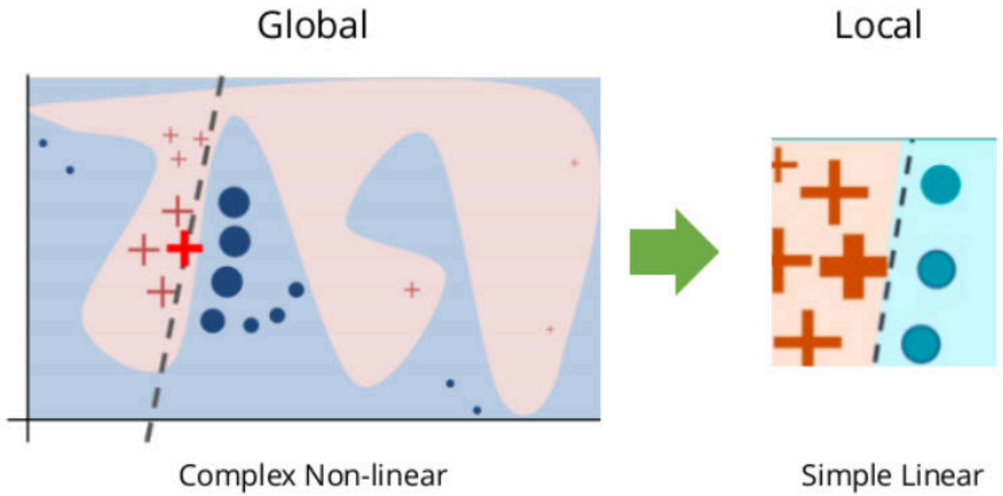
Interpretability

Exploring the Types of Interpretability in Machine Learning

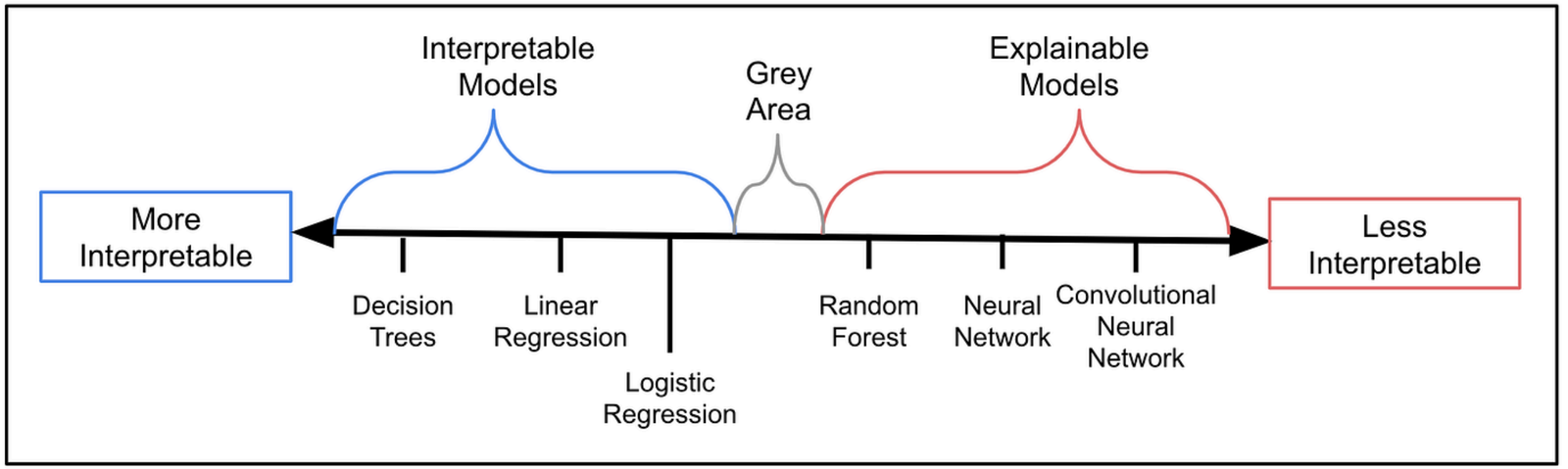


Source: Molnar, C. (2023). Interpretable Machine Learning.

Explainability

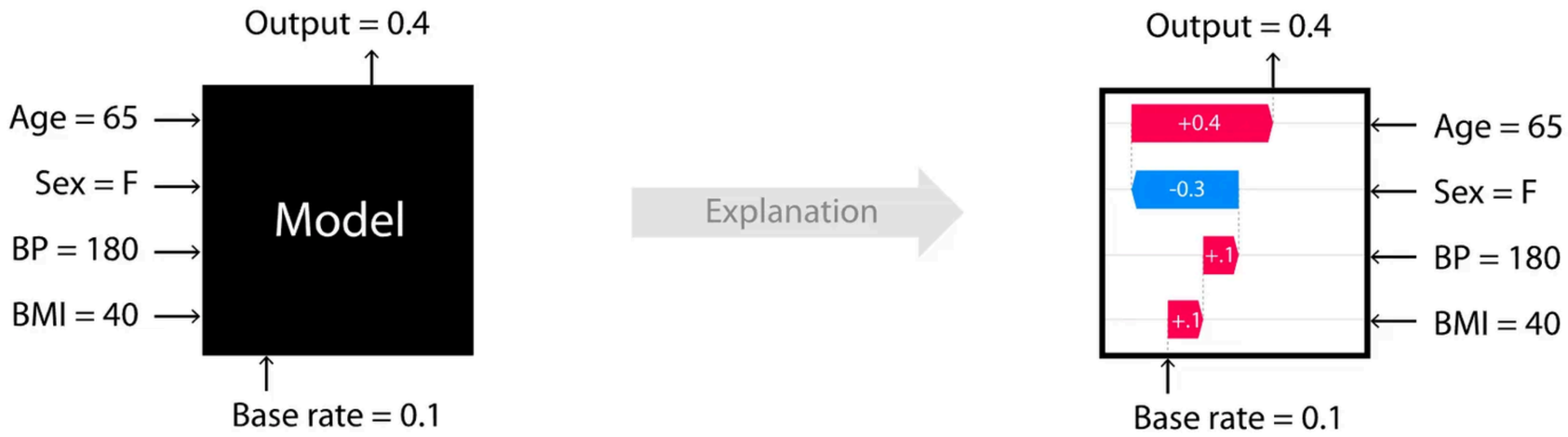


Creates a simpliflied, easy-to-understand model that approximates the complex one for a particular data point.



SHAP

SHAP or SHapley Addictive exPlanations is a technique that is used to assign a value to each feature, indicating its contribution to a model's output.



LIME

LIME, or Local Interpretable Model-agnostic Explanations, is a technique that generates local approximations to model predictions.

Example: For the prediction of diabetes risk with a Random Forest model, LIME highlights the most important factors (like blood glucose level or BMI) in a specific prediction.

AI Challenges: Ethics and Legality

ETHICAL

Regulation

Privacy

Mitigation of Bias

Transparency

Relevance

LEGAL

Governance

Confidentiality

Liability

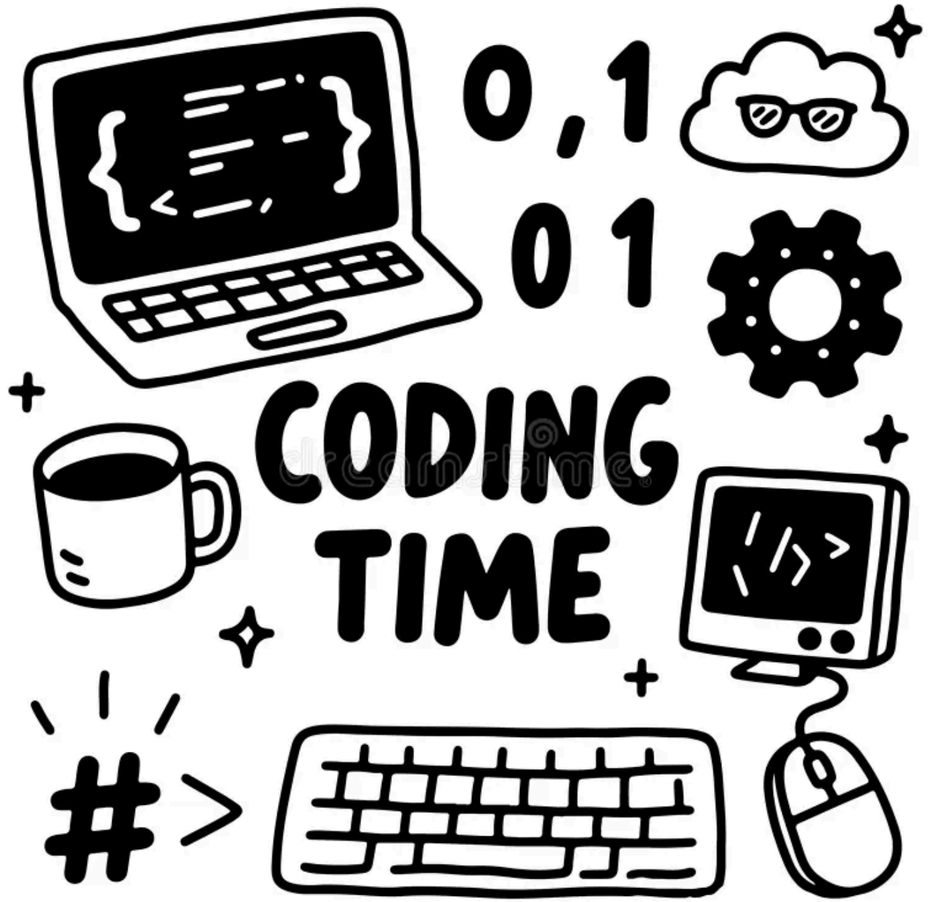
Accuracy

Decision Making

Source: Naik et al. (2022)

Conclusions

- The success of AI in medicine depends not just on accuracy, but on trust.
- Interpretability and explainability are key to building that trust, as they turn the AI's "black box" into a transparent and responsible tool.
- By proactively addressing these ethical, legal, and technical challenges, we can ensure that ML fulfills its potential to revolutionize healthcare safely and ethically.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