

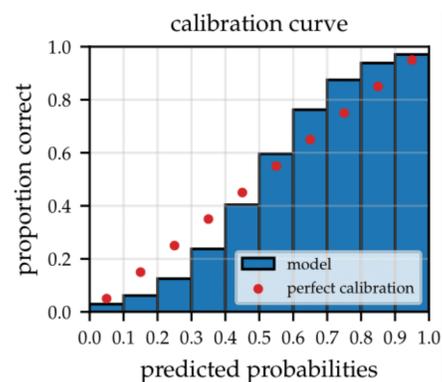
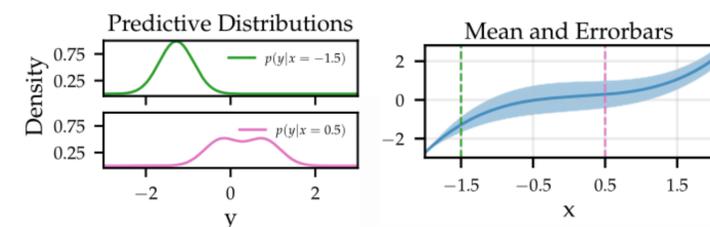
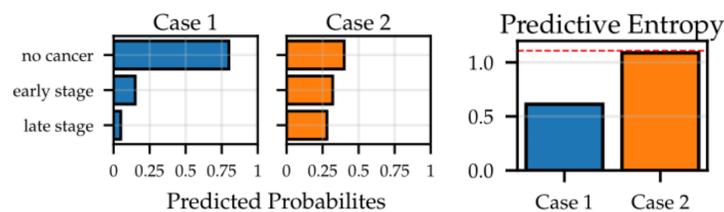
Uncertainty as a Form of Transparency: Measuring, Communicating, and Using Uncertainty

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We wrote an interdisciplinary review paper on how, similar to explainability, **uncertainty** can be treated as a form of transparency into algorithmic decision-making systems.

Measuring

	Full Information	Summary Statistics
Regression	Predictive Density	Predictive Variance, Percentile (or quantile) Confidence Intervals
Classification	Predictive Probabilities	Predictive Entropy, Expected Entropy, Mutual Information, Variation Ratio



Using

Fairness

Sampling Bias \leftrightarrow Aleatoric Uncertainty
Measurement Bias \leftrightarrow Epistemic Uncertainty

Decision-Making

Reject-Option Classifiers: Defer or abstain from prediction when uncertainty is high
Action Decision Thresholds: Decide when to take action based on uncertainty information

Trust Formation

ABI model of inter-personal trust

- **Ability:** Uncertainty information can display the competence of a model
- **Benevolence:** Uncertainty can show good intentions of model developers
- **Integrity:** Calibrated uncertainty can hint at a model's predictability

Communicating

➔ Stakeholders struggle interpreting uncertainty estimates.

While uncertainty estimates can be represented with a variety of methods, the chosen method should be one that is tested with stakeholders

