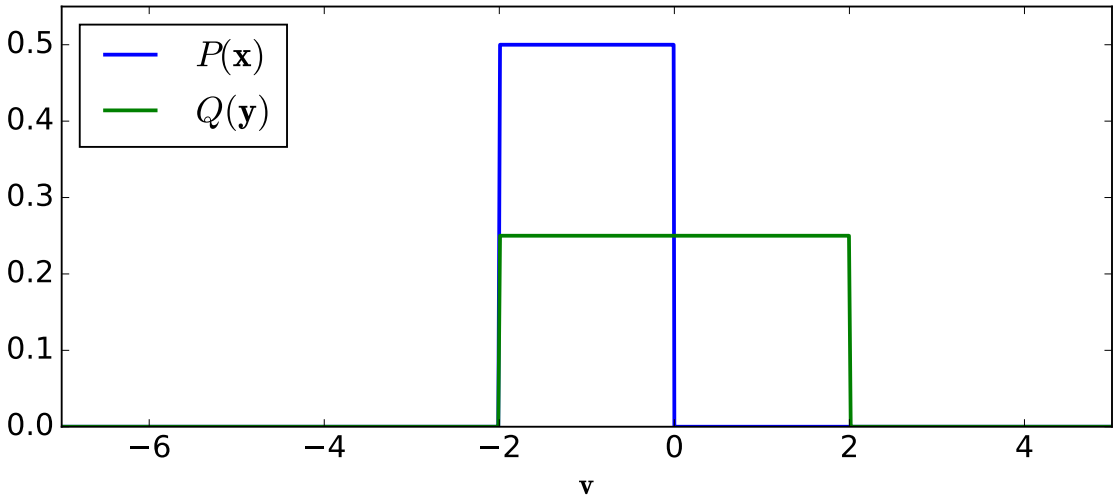
Distinguishing Distributions with Interpretable Features

Wittawat Jitkrittum, Zoltán Szabó, Kacper Chwialkowski, Arthur Gretton

Gatsby Unit, University College London

Where is the best location $\mathbf{v}$ to observe the difference of $P(\mathbf{x})$ and $Q(\mathbf{y})$?



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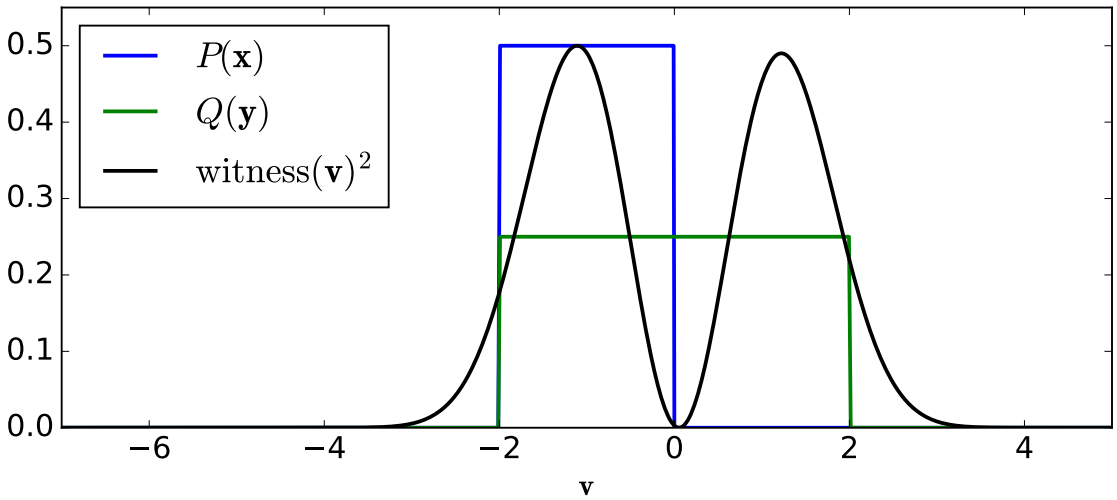

- MMD witness function: $\text{witness}(\mathbf{v}) \propto \frac{1}{n}\sum_{i=1}^{n} k(\mathbf{x}_i, \mathbf{v}) - \frac{1}{n}\sum_{i=1}^{n} k(\mathbf{y}_i, \mathbf{v})$

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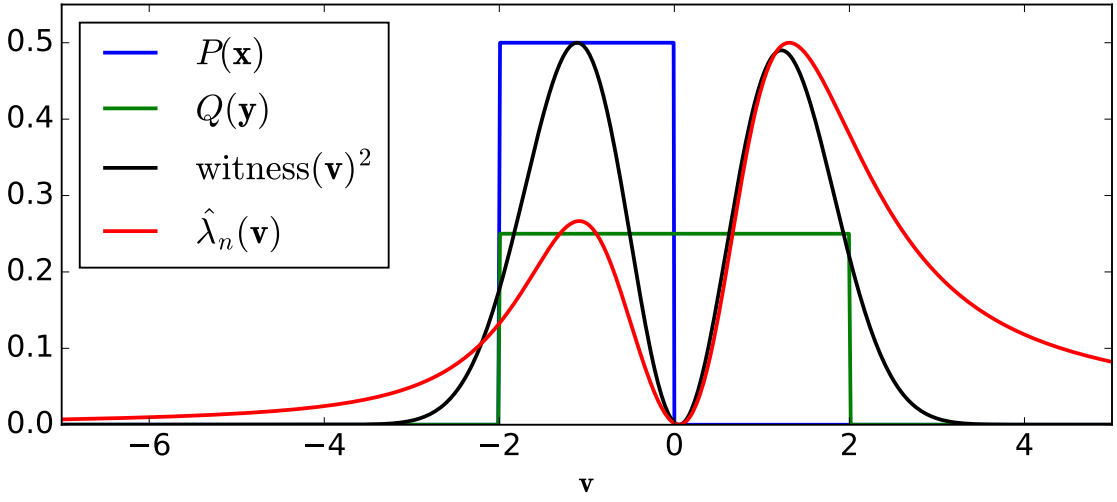

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- **Proposed statistic**: $\hat{\lambda}_n(\mathbf{v})$.

Interpretable, linear-time two-sample test.
Performance comparable to the quadratic-time MMD test.